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Anne Merken  
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## SUMMARY

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Co-production, entailing customers' active participation in the production of the core offering (e.g., self-scanning, online banking and do-it-yourself), promises great advantages for both the firm and the customer. Nonetheless, despite the ongoing proliferation, extant academic research has not yet fully unravelled how to design and manage co-production activities to reach this win-win situation. In this light, this doctoral research aims to strengthen co-production theory and practice by offering an **enhanced understanding of what drives mutually successful co-production throughout the customer relationship**. Specifically, this dissertation aids firms in overcoming three key challenges on the road to reciprocal co-production success: attracting customers (Chapter 2), fostering effective customer performance (Chapter 3 and 4) and stimulating continued co-production use (Chapter 3).

**Chapter 1** first presents an elaborate definition of co-production, capturing its primary characteristics and distinguishing it from multiple related constructs. Next, this chapter discusses the emergence of co-production and describes its relevance for marketing research and business practice. Lastly, Chapter 1 develops an integrated co-production research framework and outlines the dissertation's individual research projects.

**Chapter 2** extensively investigates customer co-production value, comprising customers' trade-off between co-production benefits and costs, to help firms design and market attractive co-production initiatives. To this end, a comprehensive co-production value conceptualization is developed and empirically tested across co-production stages (i.e., design, manufacturing and distribution stage) via a three-phase examination (i.e., literature review, customer interviews and large-scale survey). According to the results, customers only co-produce when the expected benefits (i.e., efficiency, excellence, play and social benefits) outweigh the expected costs (i.e., economic risk, personal investment and social risk) and co-production offers more value than competing alternatives. Surprisingly, a rather stable rank order of value dimensions occurs across co-production stages. First, in each stage, play emerges as the most

salient predictor of customers' co-production intent, followed by economic risk. Second, efficiency, excellence and personal investment display a significant effect on customers' co-production choice. Lastly, social benefits and social risk are the least influential value dimensions.

**Chapter 3** explores how to stimulate continued co-production use via the provision of a high-quality experience promoting customer satisfaction. Therefore, this chapter offers an overarching co-production quality typology, capturing customer, employee and firm technical contributions (i.e., what they contribute) as well as functional contributions (i.e., how they contribute). Overall, the findings support the proposed typology: customer, employee as well as firm technical quality contributions heighten customer outcome satisfaction. In contrast, only employee and firm functional quality enhance process satisfaction. Subsequently, process satisfaction impacts both firm repurchase and future co-production intentions, while outcome satisfaction merely influences customers' future co-production intent.

In addition, **Chapter 3** empirically establishes the importance of proactive socialization for fostering customers' co-production performance. Customers' understanding of what to do (i.e., role clarity), their belief in their co-production abilities (i.e., self-efficacy) and their willingness to co-produce (i.e., motivation) all enhance their technical quality contributions. In contrast, only customers' co-production motivation heightens their functional quality contributions.

**Chapter 4** develops a Co-production Demands-Resources model to further examine how firms can improve customers' performance. The results confirm the model's main premise and demonstrate an impact of co-production task demands (i.e., quantitative and qualitative workload) and resources (i.e., perceived organizational support) on customer wellbeing (i.e., strain and task engagement) and, in turn, their participative behaviours (i.e., in-role and extra-role behaviours). However, the effects form a very intricate web of relationships.

Finally, **Chapter 5** presents a synopsis of the empirical research findings, offers firms an effective roadmap to guide them on their journey to mutually beneficial co-production and provides several interesting opportunities for future research.



## SAMENVATTING

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Coproductie omvat de actieve deelname van de klant in de productie van het kernproduct of de kerndienst (bv. zelfscanning, online bankieren en doe-het-zelven) en belooft grote voordelen voor zowel het bedrijf als de klant. Echter, en ondanks de bestendige groei van coproductie, heeft bestaand wetenschappelijk onderzoek nog niet volledig ontrafeld hoe bedrijven best hun coproductie activiteiten ontwerpen en managen om deze win-win situatie te bereiken. Derhalve streeft dit doctoraatsonderzoek ernaar om bij te dragen aan de coproductie literatuur en praktijk door **meer inzicht te verschaffen in de determinanten van succesvolle coproductie doorheen de klantrelatie**. Meer bepaald helpt dit proefschrift bedrijven om drie belangrijke uitdagingen op hun weg naar wederzijds coproductiesucces te overwinnen: het aantrekken van klanten (Hoofdstuk 2), het bevorderen van effectieve klantenprestaties (Hoofdstuk 3 en Hoofdstuk 4) en het stimuleren van doorlopend coproductiegebruik (Hoofdstuk 4).

**Hoofdstuk 1** bevat eerst een diepgaande omschrijving van coproductie en zijn voornaamste kenmerken en onderscheidt coproductie van diverse gerelateerde constructen. Vervolgens wordt de opkomst van coproductie en het belang voor marketingonderzoek en de bedrijfswereld besproken. Tot slot ontwikkelt Hoofdstuk 1 een geïntegreerd coproductie onderzoeksmodel en wordt een overzicht gegeven van de verschillende onderzoeksprojecten.

**Hoofdstuk 2** onderzoekt uitvoerig de klantwaarde van coproductie, met name de afweging tussen de voordelen en de kosten van coproductie, om bedrijven te ondersteunen bij het ontwerpen en promoten van aantrekkelijke coproductie initiatieven. Daartoe wordt een omvattende conceptualisatie van coproductiewaarde ontwikkeld en empirisch getest in drie coproductiefases (i.e., de ontwerp, productie en distributiefase) via een literatuurstudie, klantinterviews en een grootschalige enquête. Volgens de resultaten coproduceren klanten enkel wanneer de verwachte voordelen (i.e., efficiëntie, excellentie, play en sociale voordelen) opwegen tegen de verwachte kosten (i.e., economisch risico, persoonlijke investeringen en sociaal risico) en coproductie meer waarde biedt

dan concurrerende alternatieven. Verrassend genoeg treedt er een vrij stabiele rangorde van waardedimensies op doorheen de coproductiefases. Ten eerste, in elke fase komt "play" naar voren als de invloedrijkste voorspeller van de coproductie intentie van de klant, gevolgd door economisch risico. Ten tweede, oefenen "efficiëntie", "excellentie" en "persoonlijke investering" een significant effect uit op de coproductiekeuze. Tot slot vormen "sociale voordelen" en "sociaal risico" de minst invloedrijke waardedimensies.

**Hoofdstuk 3** onderzoekt hoe bedrijven het doorlopend gebruik van coproductie kunnen stimuleren door een kwaliteitsvolle coproductie ervaring te verzekeren die de klanttevredenheid bevordert. Daartoe vat dit hoofdstuk de technische bijdragen (i.e., wat ze bijdragen) en functionele bijdragen (i.e., hoe ze bijdragen) van de klant, de werknemer en het bedrijf in één overkoepelende coproductie kwaliteitstypologie. De bevindingen ondersteunen deze voorgestelde kwaliteitstypologie: de technische kwaliteit van de klant, de werknemer evenals het bedrijf verhogen de klanttevredenheid met de coproductie uitkomst. Daarentegen verbeteren enkel de functionele kwaliteit van de werknemer en het bedrijf de procestevredenheid. Vervolgens beïnvloedt de procestevredenheid zowel de heraankoop intenties als de toekomstige coproductie intenties van de klant, terwijl uitkomsttevredenheid alleen invloed heeft op de toekomstige coproductie intenties.

**Hoofdstuk 3** toont daarnaast ook empirisch het belang aan van proactieve socialisatie voor het bevorderen van de coproductieprestaties van klanten. Een duidelijk inzicht in wat te doen (i.e., rolduidelijkheid), een sterk geloof in de eigen coproductiecapaciteiten (i.e., self-efficacy) en een grote bereidheid om te coproduceren (i.e., motivatie) verbeteren allemaal de technische kwaliteitsbijdragen van de klant. Echter, enkel de coproductiemotivatie van de klant verhoogt zijn/haar functionele kwaliteitsbijdragen.

**Hoofdstuk 4** ontwikkelt een Coproductie Eisen-Middelen model om verder te onderzoeken hoe bedrijven de klantprestaties kunnen verbeteren. De resultaten tonen een effect aan van coproductie taakeisen (i.e., kwantitatieve en kwalitatieve werkdruk) en middelen (i.e., gepercipieerde organisatorische



ondersteuning) op het welbevinden van klanten (i.e., ervaren stress en betrokkenheid bij de taak) en, vervolgens, op hun participatieve gedrag (i.e., "in-role" en "extra-role" gedrag). Echter, deze effecten vormen een zeer ingewikkeld web van relaties.

**Hoofdstuk 5** geeft tot slot een overzicht van de onderzoeksresultaten, biedt bedrijven een effectief stappenplan om hen te begeleiden op hun reis naar wederzijds coproductiesucces en bespreekt een aantal interessante mogelijkheden voor toekomstig onderzoek.



## TABLE OF CONTENTS

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<b>CHAPTER 1</b>	<b>1</b>
<b>CO-PRODUCTION: A THEORETICAL UNDERSTANDING AND RESEARCH FRAMEWORK</b>	
1.1 CO-PRODUCTION: WHAT IS IT?	5
1.2 THE ADVENT OF CO-PRODUCTION	15
1.3 WHY DOES CO-PRODUCTION MATTER?	17
1.4 THE ROAD TO CO-PRODUCTION SUCCESS	19
1.5 OVERVIEW OF STUDIES	22
1.5.1 Attracting customers	24
1.5.2 Fostering effective customer performance	25
1.5.3 Stimulating continued co-production use	27
<b>CHAPTER 2</b>	<b>31</b>
<b>TO CO-PRODUCE OR NOT TO CO-PRODUCE? AN INTEGRATIVE CONCEPTUALIZATION OF CO-PRODUCTION VALUE</b>	
2.1 INTRODUCTION	34
2.2 OVERALL RESEARCH DESIGN	36
2.3 LITERATURE REVIEW	38
2.3.1 Customer value	38
2.3.2 Co-production value	39
2.3.3 Co-production benefits	40
2.3.4 Co-production costs	45
2.3.5 Discussion	47
2.4 EXPLORATORY QUALITATIVE STUDY	47
2.4.1 A multi-stage perspective	47
2.4.2 Qualitative research design	48
2.4.3 Data collection and analysis	49

2.4.4	Qualitative results	52
2.4.5	Discussion	57
2.5	QUANTITATIVE STUDY	58
2.5.1	Research setting and data collection	58
2.5.2	Questionnaire design	58
2.5.3	Empirical derivation of a cost classification	60
2.5.4	Co-production value conceptualization	62
2.5.5	Analytical approach	64
2.5.6	Measurement model evaluation	65
2.5.7	Structural model evaluation	66
2.5.8	Discussion	68
2.6	CONCLUSION AND IMPLICATIONS	69
2.6.1	Theoretical implications	70
2.6.2	Managerial implications	72
2.7	DIRECTIONS FOR FURTHER RESEARCH	73
2.8	APPENDICES	76
2.8.1	Appendix A: Co-production benefit and cost explanations	76
2.8.2	Appendix B: Research scenarios	78
2.8.3	Appendix C: Measurement model evaluation	87
<b>CHAPTER 3</b>		<b>91</b>
<b>DRIVING CO-PRODUCTION SATISFACTION AND CONTINUED USE: THE ROLE OF CUSTOMER, FIRM AND EMPLOYEE QUALITY CONTRIBUTIONS</b>		
3.1	INTRODUCTION	94
3.2	THEORETICAL BACKGROUND	96
3.2.1	Co-production quality	97
3.2.2	Co-production satisfaction	100
3.2.3	Continued customer co-production	101
3.2.4	Managing customers' quality contributions	101
3.3	CONCEPTUAL FRAMEWORK AND HYPOTHESES DEVELOPMENT	103

3.3.1	Effects of co-production quality elements	105
3.3.2	Effects of customer socialization	109
3.4	RESEARCH METHODOLOGY	113
3.4.1	Research setting and data collection	113
3.4.2	Questionnaire design	114
3.4.3	Analytical approach	117
3.5	RESULTS	117
3.5.1	Measurement model evaluation	117
3.5.2	Structural model evaluation	118
3.5.3	Discussion	122
3.6	CONCLUSION AND IMPLICATIONS	124
3.6.1	Theoretical implications	124
3.6.2	Managerial implications	126
3.7	DIRECTIONS FOR FURTHER RESEARCH	129
3.8	APPENDICES	132
3.8.1	Appendix A: Measurement model evaluation	132
3.8.2	Appendix B: Relative importance and total effect estimates	137
<b>CHAPTER 4</b>		<b>139</b>
	<b>EFFECTIVELY MANAGING CUSTOMER PARTICIPATIVE BEHAVIOURS DURING CO-PRODUCTION: THE ROLE OF TASK DESIGN AND CUSTOMER WELLBEING</b>	
4.1	INTRODUCTION	142
4.2	THE JOB DEMANDS-RESOURCES MODEL	144
4.3	THE CO-PRODUCTION DEMANDS-RESOURCES MODEL	148
4.3.1	Customer participative behaviours	150
4.3.2	Customer wellbeing	151
4.3.3	Co-production demands and resources	151
4.4	HYPOTHESES DEVELOPMENT	152

4.4.1	The health impairment process	152
4.4.2	The motivational process	154
4.4.3	Health impairment and motivational process crosslinks	156
4.4.4	Demand-resource interaction: The buffer process	158
4.4.5	Demand-resource interaction: The resource activation process	159
4.5	RESEARCH METHODOLOGY	160
4.5.1	Research setting and data collection	160
4.5.2	Questionnaire design	161
4.5.3	Analytical approach	162
4.6	RESULTS	163
4.6.1	Measurement model evaluation	163
4.6.2	Structural model evaluation	164
4.7	DISCUSSION	171
4.8	CONCLUSION AND IMPLICATIONS	174
4.8.1	Theoretical implications	174
4.8.2	Managerial implications	176
4.9	DIRECTIONS FOR FURTHER RESEARCH	179
4.10	APPENDIX: MEASUREMENT MODEL EVALUATION	182
<b>CHAPTER 5</b>		<b>185</b>
	<b>CONCLUSION AND FUTURE RESEARCH</b>	
5.1	SYNOPSIS OF FINDINGS	188
5.1.1	Attracting customers	188
5.1.2	Fostering effective customer performance	189
5.1.3	Stimulating continued co-production use	191
5.2	A ROADMAP TO CO-PRODUCTION SUCCESS	192
5.2.1	Design to attract customers	192
5.2.2	Design to foster effective customer performance	195
5.2.3	Socialize to foster effective customer performance	197
5.2.4	Satisfy to stimulate continued co-production use	198

5.2.5 Conclusion	199
5.3 OPPORTUNITIES FOR FUTURE RESEARCH	199
5.3.1 The moderating role of customer characteristics	199
5.3.2 The financial consequences of fostering customer co-production performance	201
5.3.3 An employee perspective on co-production	202
5.3.4 Value co-creation opportunities in co-production	203
<b>REFERENCES</b>	<b>207</b>





**CHAPTER 1**

**CO-PRODUCTION:**

**A THEORETICAL UNDERSTANDING AND RESEARCH FRAMEWORK**

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## **CHAPTER 1**

### **CO-PRODUCTION:**

#### **A THEORETICAL UNDERSTANDING AND RESEARCH FRAMEWORK**

---

*"encouraging customers to be "co-producers" in this sense  
is the next frontier in competitive effectiveness"*

*(Bendapudi & Leone, 2003, p. 14)*

Though it is 13 years old, this statement is as true as ever (Dong, 2015; Yim, Chan, & Lam, 2012). As a result, the last decade has witnessed a tremendous growth of co-production initiatives. Realizing the possible competitive advantages (Chan, Yim, & Lam, 2010; Xia & Suri, 2014), firms have extended the opportunities for customers to actively participate in the production of the core offering. Accordingly, as a customer, you can now choose numerous co-production options in your daily activities. Consider, for instance, the case of grocery shopping for a dinner. In a not so distant past, you would go to a supermarket and list the things you need. The shop-owner would then collect them, bag them and proceed with the check-out. Today, you can self-scan your groceries and use a self check-out to pay for them. Or you can order all your groceries online (e.g., Colruyt's Collect&Go). You can even buy a do-it-yourself (DIY) food box containing recipes and necessary ingredients and then cook the meal yourself (e.g., HelloFresh). And if you need shelves to store your groceries, you can go to IKEA, collect the desired DIY kits from the warehouse and self-assemble the shelves. These are just a few examples of the countless co-production initiatives already available and their growth is only expected to continue (Dong, Evans, & Zou, 2008; Halbesleben & Buckley, 2004b; Jia, Wang, Ge, Shi, & Yao, 2012).

The recent proliferation of co-production options has drawn the attention of the academic world, resulting in an increasing interest in the topic (Etgar, 2008). Nonetheless, though co-production is gaining presence in marketing literature, the empirical investigations have not yet matched its extensive use in practice and many promising research avenues remain open (Haumann, Güntürkün, Schons, & Wieseke, 2015). This is well expressed by Peters, Bodkin and

Fitzgerald (2012): "*research has begun to flourish in the domain of co-production, yet ... marketers still have a lot to learn about how and why consumers engage in co-production*" (p. 124).

Though the sharp rise in co-production initiatives may suggest otherwise, developing a co-production option is no guarantee for success (Bendapudi & Leone, 2003; Meuter, Bitner, Ostrom, & Brown, 2005). Many introduced initiatives fail or not live up to firms' expectations (Curran & Meuter, 2007). Hence, on the one hand, co-production holds the potential for competitive advantage, on the other hand, considering its resource-intensive implementation, co-production brings with it substantial economic risks for firms (Greer, 2015; Halbesleben & Buckley, 2004b; Tax, Colgate, & Bowen, 2006). In light of this challenge, **this doctoral dissertation aims to extend co-production theory and practice by offering an enhanced understanding of what drives successful co-production throughout the customer relationship** (i.e., customer attraction, development and retention). Thereby it answers calls for increased research on the antecedents and consequences of effective co-production (Bowers & Martin, 2007; Etgar, 2008; Peters et al., 2012), which is needed to reap the strategic and financial benefits associated with successful co-production. Further, in line with the essence of (value-based) marketing, emphasizing mutually beneficial relationships (AMA, 2013; Grönroos & Ravald, 2011; Payne, Storbacka, & Frow, 2008), this doctoral research adopts a customer-oriented perspective in understanding co-production success, since positive customer evaluations and behaviours drive firms' business performance (Rust & Zahorik, 1993; Zeithaml, Berry, & Parasuraman, 1996).

The remainder of this chapter provides a theoretical understanding of co-production. First, the concept is elaborated on and distinguished from related constructs. Second, the emergence of co-production and its relevance for marketing research and practice are discussed. Next, the dissertation's overall objective and research framework are introduced. Finally, an overview of the different chapters and empirical studies in this dissertation is presented.

## 1.1 CO-PRODUCTION: WHAT IS IT?

In prior literature there prevails an unscrutinised and interchangeable use of multiple related but distinct terms. For instance, some studies employ the term co-production when actually examining customer participation (e.g., Büttgen, Schumann and Ates, 2012; Guo, Arnould, Gruen and Tang, 2013), while other investigations refer to co-creation when in fact evaluating a co-production setting (e.g., Xia & Suri, 2014). As this variety of co-production conceptualizations hinders coherent academic research (Groth, 2005), this section provides a detailed definition of co-production and, subsequently, compares co-production with customer participation, self-service, value co-creation, customer involvement and customer engagement.

An inspection of the existing literature reveals various co-production definitions (see Table 1).

**Table 1:** Co-production definitions

Authors	Definition
Atakan, Bagozzi and Yoon (2014)	[T]he active engagement in the creation of end products by consumers (p. 395).
Troye and Supphellen (2012)	Customers engage in self-production when they play an active role in the creation of end products, such as preparing a meal or assembling a piece of furniture (p. 33).
Grönroos and Ravald (2011)	[C]ustomers engage themselves with the production process and become participants in that process (p. 7).
Etgar (2008)	Co-production implies that consumers participate in the performance of the various activities performed in one or more of these stages [of the production activity chain] (p.98).
Lusch, Vargo and O'Brien (2007)	[C]o-production involves the participation in the creation of the core offering itself (p. 11).
Lengnick-Hall, Claycomb and Inks (2000)	Co-production means engaging customers as active participants in the organization's work (p. 364).

Further examining previous research also uncovers several defining co-production characteristics. First, as expressed in the above definitions, during co-production customers become participants in the firm's work and **actively involve themselves in the offering's production process** (Lengnick-Hall et

al., 2000; Lengnick-Hall, 1996). The production process covers a sequential chain of operational activity bundles, including the **design, manufacturing and distribution of offerings** (i.e., goods and services) for customer usage or consumption (Grönroos & Ravald, 2011; Grönroos & Voima, 2013). Customers can engage in co-production at each stage of this production activity chain (Etgar, 2008). Participation in the design stage covers, for instance, designing your own Nike shoes (i.e., NIKEiD) or planning your hike through the Andes. Manufacturing participation includes, for example, IKEA furniture assembly, Build-A-Bear workshops and DIY kits and activities. Finally, the distribution stage is characterized by self-service technologies (SSTs). SSTs are technology interfaces that facilitate customer service production independent of direct employee involvement (Meuter, Ostrom, Roundtree, & Bitner, 2000), such as supermarket self-scanning, online banking or airport self check-in.

Further, co-production indicates a transfer of work (Bolton & Saxena-Iyer, 2009) as **production tasks are shifted from a firm employee to the customer** (Campbell, Maglio, & Davis, 2011; Halbesleben & Buckley, 2004b). In other words, the customer fulfils one or more production tasks that were traditionally performed by firm employees (Groth, 2005; Hilton, Hughes, Little, & Marandi, 2013). As such, he/she takes on a new role of co-producer, comprising a set of new responsibilities, the learning of new behaviours and the performance of novel tasks (Etgar, 2008; Meuter et al., 2005; van Beuningen, de Ruyter, Wetzels, & Streukens, 2009).

However, as inherent to the term, co-production represents a **joint effort of the customer, the firm and (potentially) its employees** (Bendapudi & Leone, 2003; Bolton & Saxena-Iyer, 2009). Customer contributions to the production process include **physical efforts, mental inputs** (e.g., information and cognitive effort) **and emotional energy** (e.g., appropriate behaviour) (Atakan et al., 2014; Etgar, 2008; Rodie & Kleine, 2000). As customers primarily perform the co-production task, firms are limited to playing a facilitating role (Dong, Sivakumar, Evans, & Zou, 2015). They provide necessary inputs (e.g., materials, equipment and technology platforms) with which customers interact in co-producing the offering (Troye & Supphellen, 2012). In a

similar vein, if part of the co-production activity, employees take on a supportive role and act as coaches or consultants (Etgar, 2008; Hilton et al., 2013; Lengnick-Hall, 1996).

Through their productive inputs, customers become **partial employees** of the firm (Bendapudi & Leone, 2003; Bettencourt, Ostrom, Brown, & Roundtree, 2002). They are temporary participants in the organization's work (Bitner, Faranda, Hubbert, & Zeithaml, 1997) and represent human resources that should be managed (Bowers & Martin, 2007; Halbesleben & Buckley, 2004b). As partial employees, customers exert a **substantial influence on the outcome** of the co-production experience (Bettencourt et al., 2002). As such, they become partly responsible for the co-production outcome and their own satisfaction (Bendapudi & Leone, 2003; Meuter et al., 2005). Consequently, effective customer performance is essential for a satisfying co-production experience.

Finally, **co-production is (relatively) optional** and can vary from no production participation at all to extensive participation (Hilton et al., 2013; Jacob & Rettinger, 2011; Vargo & Lusch, 2008). By choosing between a co-production option and a full-service alternative, customers decide whether to engage in co-production or not (Bateson, 1985; Meuter et al., 2005). Consider, for instance, the case of buying a new wardrobe. Customers can buy a DIY kit at IKEA and self-assemble the wardrobe. They can also use the assembly service offered by IKEA. Additionally, they can buy a wardrobe at a full-service furniture store or hire a professional carpenter. However, we view co-production as *relatively* optional, since the choice between co-production and full-service is a rather drastic one in some cases (Reinders, Frambach, & Kleijnen, 2015). For example, if a particular supermarket chain only provides self check-outs, customers' only option is to switch to another supermarket chain if they do not want to co-produce.

Based on the above descriptions, we discern several key features of co-production (see Table 2).

**Table 2:** Defining characteristics of co-production

Co-production ...
1. entails customers' active participation in the production process.
2. can occur in the design, manufacturing and/or distribution stage.
3. implies a transfer of production tasks from employees to customers.
4. comprises a joint production effort by the firm, (its employees) and the customer.
5. requires customers' productive labour contributions (i.e., mental, physical and/or emotional inputs).
6. turns customers into partial employees of the firm that influence the co-production outcome.
7. is optional.

Considering these characteristics and the main elements of the cited co-production definitions, this doctoral dissertation defines co-production as follows:

***Co-production entails customers' active participation in the production (i.e., design, manufacturing and/or distribution) of the core offering (i.e., goods and services).***

Co-production is frequently mentioned in the same breath as customer participation and value co-creation. Further, confusion regarding the specific meaning of co-production, self-service, customer involvement and customer engagement often endures. However, as a clear distinction exists between these concepts, their interchangeable use in literature results in a lack of conceptual clarity (Dong et al., 2015). Therefore, the next paragraphs highlight the differences between co-production and these associated constructs.

### ***Self-service***

Self-service denotes serving yourself or carrying out the different aspects of a service encounter without employee assistance (Longman, 2003; Meuter & Bitner, 1998). Pumping your own petrol at gas stations and self-service restaurants, such as McDonald's, are popular instances of self-service options (Bateson, 1985). With the ongoing technological advances, the implementation of self-service technologies (SSTs) has been rapidly expanding in recent years (Haumann et al., 2015; Jia et al., 2012). SSTs represent technological interfaces



that enable customers to independently produce an offering (Meuter et al., 2000). Examples include ATMs, retail self check-outs, supermarket self-scanning, online investment trading and online booking.

In self-service, customers actively participate in the production of an offering by carrying out one or more production tasks traditionally done by an employee (Campbell et al., 2011). This demands customer labour contributions and turns customers into partial employees of the firm (Dabholkar, 1996; Hilton et al., 2013). Though self-service thus meets the key criteria of co-production, these two concepts are not equivalent. Self-service activities and technologies occur in the distribution stage as they are related to the flow and storage of offerings (Etgar, 2008). This is also evident in the definition of self-service, referring only to the collection of products and services (Cambridge Dictionaries Online, 2015).

Hence, co-production is more encompassing than self-service. Besides taking on an active role in the distribution stage, co-production also entails customers' participation in the design and manufacturing stages of production. Put differently, self-service is a specific type of co-production, related to the distribution of the offering.

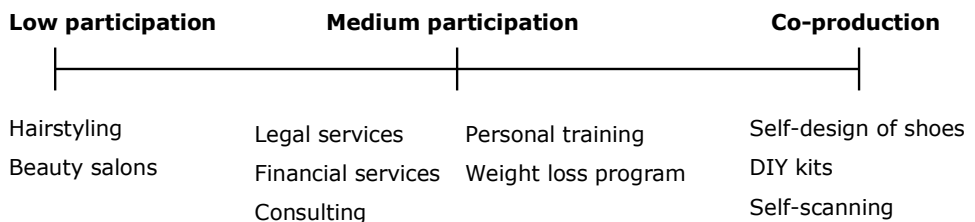
### ***Customer participation***

Customer participation describes the extent of customer involvement in services production and delivery, and includes the actions and resources contributed by the customer (e.g., Dabholkar, 1990; Yim et al., 2012). As indicated below, customer participation differs from co-production by the nature and scope of contributions. Customer participation covers a broader conceptual domain, capturing a variety of customer roles, including co-production (Dong et al., 2015).

Since customer participation entails the degree of customer involvement, it represents a continuum, ranging from low to high participation (see Figure 1) (Bitner et al., 1997). At low levels, only customers' physical presence and/or some basic information is required. Personal care services, such as a manicure or massage, fall under this heading. The service is almost entirely produced and

delivered by the firm and its employees (Dong et al., 2008). At medium levels of participation the customer collaborates with the firm in producing the service by providing necessary information and/or effort (Dong et al., 2015). For instance, in professional financial services customers must supply all required information, such that employees can fulfil their tasks (Chan et al., 2010; Yim et al., 2012). High participation levels form the arena of co-production. The customer takes on the primary production role, while the firm (and its employees) have a supporting and facilitating function (Dong et al., 2015).

**Figure 1:** Customer participation continuum



Hence, co-production represents a specific form of customer participation (Büttgen et al., 2012). Nonetheless, several important differences exist between co-production and the other levels of customer participation (referred to as low-medium customer participation in the remainder of this analysis). These differences are described below.

A main distinction concerns the transfer of production tasks (Halbesleben & Buckley, 2004b). In co-production, the customer performs productive work traditionally carried out by an employee. On the other hand, low-medium customer participation does not involve a shift of production tasks. Think, for example, about weight loss programs or personal fitness training. The customer has to contribute effort and information but no tasks are shifted from the employee to the customer.

Related, for low-medium customer participation physical customer presence and/or information provision is sufficient in many cases (Bitner et al., 1997; Gallan, Jarvis, Brown, & Bitner, 2013; Halbesleben & Buckley, 2004b). In

contrast, co-production requires productive labour contributions on the part of the customer. Though also part of the customer's production task, basic information provision (e.g., sharing of preferences and needs) alone is not sufficient for co-production as it does not entail the learning of new skills or the risk of low self-performance (Etgar, 2008).

Further, low-medium customer participation focuses on participation in the delivery of traditional services (e.g., health care, consulting and legal services), whereas co-production covers participation in the production process of both goods and services (Haumann et al., 2015). For instance, at IKEA the customer co-produces a wardrobe (i.e., a good), while at RyanAir the customer co-produces the transportation service via online booking and self check-in.

Finally, due to the inseparability of production and consumption in services (Bowers & Martin, 2007), low-medium customer participation is not optional. For example, considering the case of a hairstyling service, customer physical presence and provision of basic information (e.g., desired hair colour) is mandatory (Halbesleben & Stoutner, 2013). In contrast, co-production is a non-compulsory activity. Customers can decide to co-produce or they can choose a full-service alternative, either within the same firm or offered by another firm.

Although differences exist between low-medium customer participation and co-production, they share several similarities. Both require an active participation of the customer and demand some kind of customer contribution. This way, the customer has some influence over the outcome and becomes a partial employee of the firm (Bendapudi & Leone, 2003; Ennew & Binks, 1999). Due to these similarities, insights and theories from customer participation in services literature present an interesting starting point for research on co-production.

### ***Customer involvement***

In marketing literature, customer involvement pertains to the level of personal relevance or importance of an offering for a customer and describes how central an object is to a person's ego structure (Rodie & Kleine, 2000; Zaichkowsky, 1994). Customers are highly involved when a product, service or decision has

substantial effects on their own lives and/or they perceive it as a reflection of their inner self (Petty & Cacioppo, 1981).

Co-production, entailing an active production participation, is thus clearly distinct from the marketing concept of customer involvement. For instance, a high-involvement offering may provide few possibilities for co-production (e.g., the purchase of an expensive painting). Alternatively, a customer may co-produce substantially while remaining rather uninvolved (e.g., self-scanning groceries).

The confusion between customer involvement, co-production and customer participation may stem from involvement's general use in the English language. According to the Longman Dictionary of Contemporary English (2003), involvement is the act of taking part in an activity and is synonymous to the word "participation". Consequently, customer involvement is often used as a synonym for customer participation. This becomes apparent, for instance, in the definition of customer participation as the degree of customer involvement in services production and delivery (Yim et al., 2012).

### ***Customer engagement***

Customer engagement (CE) reflects customers' psychological state, characterized by differing degrees of cognitive, emotional and behavioural activity, depending on the context and engendered by interactive experiences with a focal object (e.g., a brand, product or firm) (Brodie, Hollebeek, Juric, & Ilic, 2011). Customer participation and involvement are necessary preconditions to the expression of a particular level of engagement (Vivek, Beatty, & Morgan, 2012).

In turn, customer engagement behaviour (CEB) is regarded as a behavioural manifestation of customer engagement towards a brand or firm that goes beyond mere transactions (Verhoef, Reinartz, & Krafft, 2010). CEB looks further than customer purchase and repurchase actions to non-transactional customer behaviours, such as word-of-mouth (WOM) activity, writing reviews and customer referrals (van Doorn et al., 2010). These behaviours augment the

value of a customer to the firm (Kumar et al., 2010).

Specific co-production experiences can generate customer engagement towards the co-production activity, outcome and/or firm and, subsequently, induce engagement behaviours. However, both concepts are distinct as co-production is related to the purchase of an offering, while customer engagement does not necessitate a purchase or planned purchase (Vivek et al., 2012). Further, co-production comprises customers' contributions for their own consumption, whereas CE has a firm focus, benefiting or harming the firm (Dong, 2015; Verleye, Gemmel, & Rangarajan, 2014). Moreover, CE does not fulfil the key criteria of co-production (see Table 2). Customer engagement behaviours, such as helping other customers, do not demand customers' active participation in the production of an offering. In addition, as in the provision of positive WOM, no production tasks are transferred from employees to customers. Also, no joint effort is required as customers can, for instance, independently provide ratings on a comparison website such as TripAdvisor (Verhoef et al., 2010).

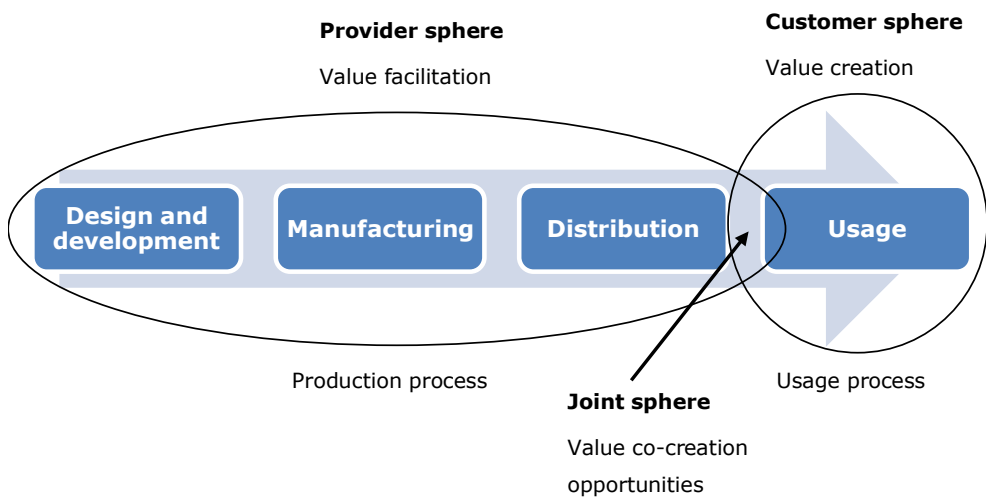
Similar to the discussion on customer involvement, the confusion with co-production may arise from the common English use of engagement as doing or becoming involved in an activity (Longman, 2003). For example, multiple co-production definitions cited in Table 1 employ the engagement concept in this way.

### ***Value co-creation***

To explain the difference between co-production and value co-creation, the so-called value spheres of Grönroos and Voima (2013) are used, as they clearly explain the roles of the provider and the customer (see Figure 2). The firm controls the provider sphere where it produces resources (i.e., goods and services) that have potential value for the customer. In this way, the firm facilitates the customer's value creation. In the customer sphere, which is closed to the provider, the customer independently transforms the potential value of these resources into real value or value-in-use. As such, the customer is the actual creator of value. In the joint sphere, the customer and firm are involved in each other's activities or processes via direct interactions. The firm therefore

"gets opportunities to influence the process of value creation, in the best case enhancing the level of value the customers create out of a service activity or a good" (Grönroos & Ravald, 2011, p. 10). Since interactions can take place in every phase of the customer-firm relationship, a joint sphere can arise in every stage of the relationship, even in the production process. Accordingly, Figure 2 is a simplification of the reality, as the production and value creation processes normally are not linear (Grönroos, 2011). Value facilitation, creation and co-creation activities can occur in various sequences.

**Figure 2:** Co-production and value co-creation (Based on Grönroos and Voima (2013))



In a single sentence Grönroos and Voima (2013) capture the difference between value creation and value co-creation as follows: "Value creation refers to customers' creation of value-in-use; co-creation is a function of interaction" (p. 133). Thus, firms can try to engage themselves in the customer's usage process by means of direct interactions (e.g., by adding installation or maintenance services) (Grönroos, 2011). Via these direct interactions, the firm enters the customer sphere and a joint sphere arises where the firm gets opportunities to affect the customer's value creation process (Grönroos & Voima, 2013). This way, the firm becomes a co-creator of value. For instance, some electronic providers offer their customers special workshops on the usage of sophisticated cameras. This way, they attempt to co-create value by increasing the value customers can create during their usage of the camera. Or, via the NIKE+

platform, Nike gets involved in customers' usage of their running equipment, thereby aiming to enhance customers' value-in-use and, thus, co-create value. Summarized, while customers are always the creators of value, during direct interactions, firms, in addition to being value facilitators, have the chance to become value co-creators in a process of joint value creation with their customers (Grönroos & Ravald, 2011).

Consequently, in co-creation the customer is in charge of the value creation process and the firm enters this process during direct interactions with its customers (Grönroos & Voima, 2013). In contrast, in co-production the firm manages the production process and the customer is invited to join this process (Grönroos, 2011). Nonetheless, when the customer participates in the firm's production process, direct customer-firm interactions can also take place and the joint sphere can widen to include one or more stages of the production process (Grönroos & Voima, 2013). As such, the firm can involve itself in the customer's value creation process and co-create value with the customer (Grönroos & Ravald, 2011). Hence, possibilities for co-creation of value can occur during co-production, however, this is not the focus of this doctoral dissertation.

Concluding, co-production entails the customer's active participation in the firm's production process, whereas value co-creation comprises the firm's active participation in the customer's value creation process through direct interactions.

## **1.2 THE ADVENT OF CO-PRODUCTION**

The multitude of co-production initiatives did not appear out of nowhere. A favourable societal climate, fostering co-production, first had to evolve.

According to Toffler (1980), three major waves of social and economic development occurred throughout history. During the first wave, the Agricultural Era, people were self-producers out of pure necessity. To survive, the vast majority of people had to grow their own food, make their own clothes, ... As such, production and consumption were joined in the same individual. The second wave, starting with the Industrial Revolution, was the age of

industrialization and marketization, and was characterized by the emergence of large corporations, specialization, standardization, mass production, mass media and mass consumption. Production and consumption became separated as most people spent their productive time at factories or offices to produce goods for exchange instead of use, and then bought the goods they needed with their earnings (Kotler, 1986).

In the post-industrial age, third wave societies moved towards de-massification and individuation, and consumers again started to produce more and more of their own products and services, blurring the line between producer and consumer. As argued by Toffler (1980), multiple economic and cultural changes paved the way for this new arise of co-production. First, the decline of the workweek provided people with added discretionary time, in which they can pursue co-production or leisure activities. Second, the rising costs of skilled labour (e.g., electricians and carpenters) encouraged people to perform some production activities themselves. Third, the huge technological progress and the rise of the Internet made many new co-production initiatives possible (e.g., self-check-outs and online banking) (Xie, Bagozzi, & Troye, 2008). Fourth, work in technologically advanced societies becomes increasingly mental. As a result, people seek ways to exert their physical energy, for instance, through co-production. Fifth, people who find high quality important, may feel that they can produce better goods than those available in the market. This is especially relevant when co-production provides the opportunity to customize the offering. Finally, in mature economies, where people's basic physiological and safety needs are met, individuals' search for self-actualization or self-expression drives them to produce their own products and/or services (Etgar, 2008).

From another perspective, the shift from a goods-dominant (G-D) paradigm to a service-dominant (S-D) logic (Vargo & Lusch, 2004) contributed to the creation of a favourable foundation for co-production. G-D logic focuses on tangible goods and value-in-exchange. Firms create and deliver value by embedding physical goods with value during production (Lusch et al., 2007). Then, during the exchange, the good and its inherent value are transferred to the customer, who is a passive recipient in the whole value creating process (Xie et al., 2008).



As such, similar to Toffler's (1980) second wave, G-D logic is characterized by a clear division between production and consumption or between producer and consumer (Vargo, Maglio, & Akaka, 2008).

However, this G-D perspective is giving way to a new paradigm which centres on intangibles, specialized skills and knowledge (i.e., service), and views goods as distribution mechanisms for service provision (Vargo & Lusch, 2008). In this new service-dominant logic the customer is always the creator of value while the firm is a value facilitator (Grönroos & Ravald, 2011). Firms produce resources, containing potential value, and offer value propositions (Grönroos & Voima, 2013). If the customer accepts the value proposition, he/she can create real value during use (i.e., value-in-use). Hence, the customer is no longer viewed as a passive responder but is considered an active participant in the process of value creation (Vargo & Lusch, 2004). Firms should collaborate with customers, who can actively take part in relational exchanges and co-production.

### **1.3 WHY DOES CO-PRODUCTION MATTER?**

Why is it important to spend time and resources on co-production research? And why do we expect the sharp growth of co-production formats to continue?

It all comes down to this: co-production is expected to result in a win-win situation (Bendapudi & Leone, 2003; Halbesleben & Buckley, 2004b) and benefit both the firm and the customer (Chan et al., 2010; Dong et al., 2008). From a firm perspective, co-production can be an effective marketing tool as prior research recognizes it as a source of competitive advantage (Xia & Suri, 2014; Xie et al., 2008; Yim et al., 2012) or describes it as "*the next frontier in competitive effectiveness*" (Bendapudi & Leone, 2003, p. 14). Mostly, co-production is praised for creating productivity gains and for generating cost savings, via substantial reductions in labour costs (Auh, Bell, McLeod, & Shih, 2007; Halbesleben & Buckley, 2004b). Further, co-production is thought to foster operational efficiency (Dong et al., 2008), heighten quality (Ennew & Binks, 1999; Gallan et al., 2013), enhance customer satisfaction and loyalty (Auh et al., 2007; Dellande, Gilly, & Graham, 2004), raise customers' willingness

to pay (Franke & Schreier, 2010; Mochon, Norton, & Ariely, 2012), increase the firm's market share (Shamdasani, Mukherjee, & Malhotra, 2008), improve access to new customer segments and fill market niches (Bolton & Saxena-Iyer, 2009; Rodie & Kleine, 2000).

Also for customers, co-production can create notable advantages as production inputs are often compensated by a price reduction, increased efficiency or added convenience (Auh et al., 2007; Etgar, 2008; Jia et al., 2012). Additionally, customers benefit from a higher perceived control and more opportunities for customization (Bitner, Brown, & Meuter, 2000; Collier & Sherrell, 2010; Dabholkar, 1996). Finally, engaging in co-production may be intrinsically attractive as customers find their participation enjoyable or fun (Dong et al., 2008; Yim et al., 2012).

Based on the above, developing co-production options appears to be a golden ticket to organizational success. The achievements of co-production businesses like IKEA, RyanAir and Booking.com evince that co-production can be a profitable business strategy. Unfortunately, not all that glitters is gold. Besides the success stories, co-production also knows multiple accounts of initiatives not living up to firms' expectations (Dong et al., 2015). Co-production often requires considerable time and effort on the part of the customer (Etgar, 2008; Xia & Suri, 2014), and brings with it multiple risks (Crespo, del Bosque, & de los Salmones Sánchez, 2009). Further, the new tasks and unfamiliar technologies in co-production may cause customer stress and anxiety (Collier & Sherrell, 2010; Curran, Meuter, & Surprenant, 2003), and regularly lead to co-production failures (Robertson, Mcquilken, & Kandampully, 2012). Combined, this can result in disappointing acceptance rates (Curran & Meuter, 2007; Jia et al., 2012; Weijters, Rangarajan, Falk, & Schillewaert, 2007) as customers avoid co-production options altogether or abandon them after a dissatisfactory experience (Wang, Harris, & Patterson, 2013). Today, customers still do not readily adopt co-production. For instance, in response to a survey indicating that 67% of its customers prefer staffed check-outs, super market chain Morrisons brought back staffed express check-outs (Smithers, 2015). Given the large organizational investments of time and money to develop and implement co-production

activities, the low adoption levels can give rise to considerable financial losses for firms (Curran et al., 2003; Weijters et al., 2007). Additionally, the shift of production work to customers holds risks, since customers often fail in their role as co-producer or participate inadequately (Gallan et al., 2013; Tax et al., 2006). The resulting customer-caused problems can also create substantial costs for firms.

Figure 3 clearly summarizes the preceding discussion. Co-production can lead to a mutually beneficial “sweet spot” where both the firm and the customer attain a high value. However, badly designed and managed co-production activities that disregard customer value will result in low usage rates and, ultimately, also deliver low value for the firm.

**Figure 3:** The customer/firm value matrix  
 (Thanks to M. Meuter for this insightful figure)

		<b>Customer value</b>	
		High	Low
<b>Firm value</b>	High	The mutually beneficial “sweet spot”	Focus is on cost savings; Internal efficiency is the driving force
	Low	Separation from the firm; Customers become self-sufficient and no longer need services	Difficult to use offering, bad information, “harm” to customers

### 1.4 THE ROAD TO CO-PRODUCTION SUCCESS

As the previous section indicates, co-production can create considerable advantages for customers and substantial competitive gains for firms but also brings with it notable risks and challenges. This raises an interesting question: What drives mutually advantageous and profitable co-production options? Despite the ongoing proliferation of co-production initiatives, extant academic research has not yet fully unravelled this question. Much remains to be learned on how to successfully develop, implement and manage co-production activities,

such that customers and firms can obtain its enticing advantages. Taken together, this highlights the relevance of this dissertation's central research goal, namely to **provide an enhanced understanding of the drivers of reciprocal co-production success.**

To address this overall aim and contribute to co-production theory and business practice, this doctoral dissertation empirically investigates how firms can overcome three key challenges on the road to joint co-production success: attracting customers, fostering effective customer co-production performance, and stimulating customers' continued use of co-production formats (see Figure 4). This way, this dissertation substantially advances theoretical knowledge on the determinants of co-production success from a customer perspective. Practically, it offers firms an effective roadmap to guide the development of mutually beneficial co-production initiatives.

**Figure 4:** The road to co-production success



The co-production challenges are broadly based on the innovation adoption process, since this process covers the relevant steps in implementing a successful new initiative: awareness, interest, evaluation, trial, repeated use and commitment (Rogers, 2003). This doctoral dissertation focuses on the trial and repeated use stages as inducing customer trial and ongoing usage form the two prime co-production implementation obstacles for firms (Meuter et al., 2005; Wang et al., 2013). This is also in line with the core management processes of the customer lifecycle, including customer acquisition, customer retention and customer development (Buttle, 2009). Both customer acquisition and retention are fundamental drivers of firm financial performance (Reinartz, Krafft, & Hoyer, 2004; Reinartz, Thomas, & Kumar, 2005; Rust, Lemon, & Zeithaml, 2004). As such, firms are encouraged to move beyond a mere emphasis on attracting

customers and also cover satisfying, retaining and enhancing their customers (Bitner, 2000).

First, convincing customers to try a co-production option forms a prominent challenge as initial usage often requires a substantial behaviour change on the part of the customer (Curran & Meuter, 2007; Meuter et al., 2005). The discouraging co-production adoption rates underscore the relevance of this challenge. Second, while attracting new customers is fundamental for success, it is continued use that drives firms' long-term viability (Wang et al., 2013). This notion is reflected by the last challenge in Figure 4. Third, to realize the transition from initial customer use to ongoing usage, ensuring high-quality customer performance is imperative (Tax et al., 2006). Effective customer performance, constituting the second challenge in achieving successful co-production, is particularly salient for co-production as customers, through their execution of production tasks, substantially affect the outcome of the offering (Bettencourt et al., 2002; Halbesleben & Stoutner, 2013). The criticality of adequate customer performance is further underlined by the finding that the quality and quantity of customer contributions often is not sufficient, reducing the potential value for both the customer and the firm (Greer, 2015; Halbesleben & Buckley, 2004b). In addition, customers, unlike employees, are not under the firm's direct control and, thus, are less easy to manage (Groth, 2005; Hilton et al., 2013).

The three challenges translate into three research questions that must be answered to arrive at the final destination of the co-production journey: mutually beneficial customer-firm relationships.

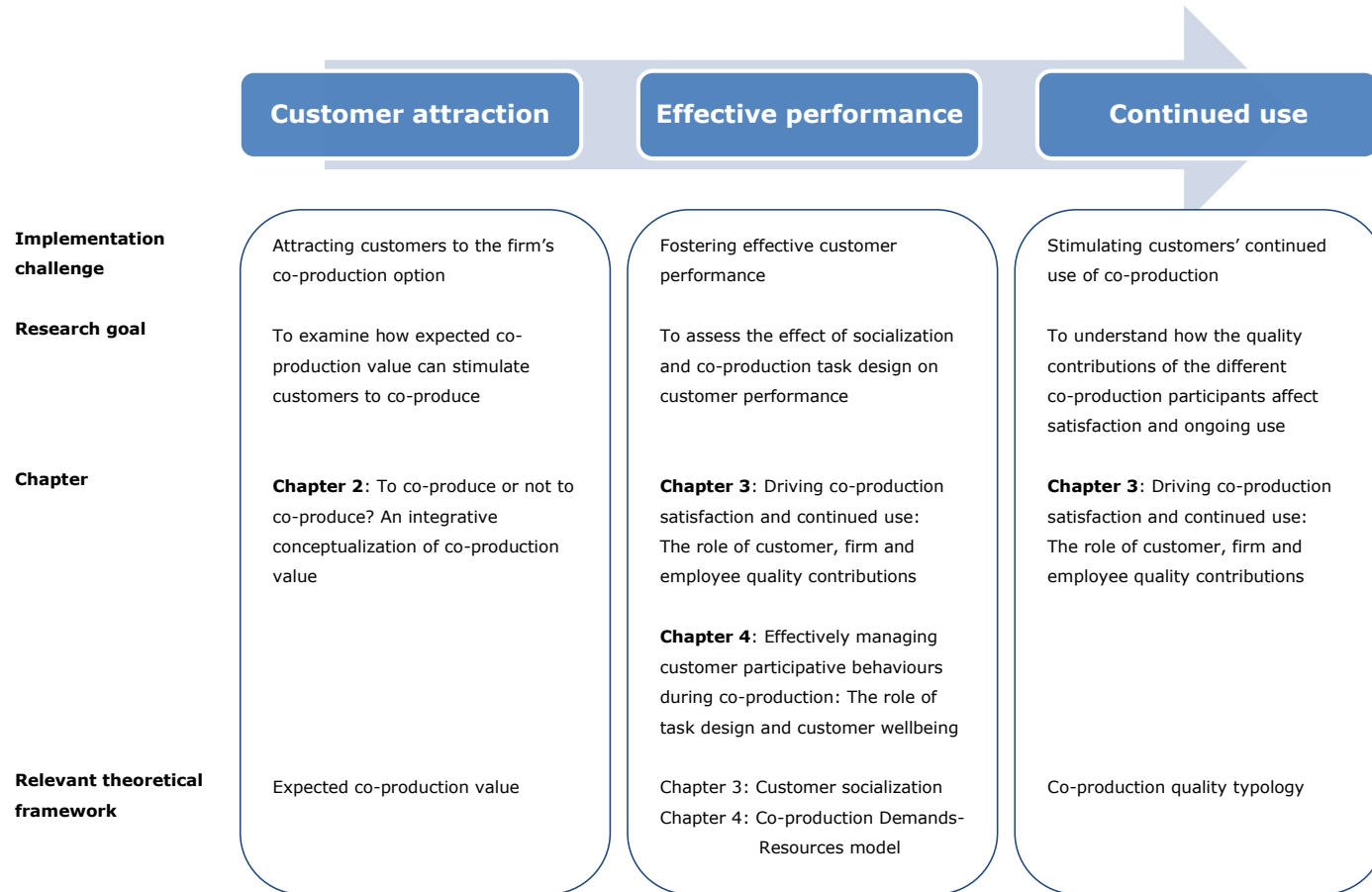
- First, how can firms attract customers to their co-production initiative?
- Second, how can firms foster customers' effective co-production performance?
- Third, how can firms stimulate customers' continued use of their co-production initiative?

The remainder of this doctoral dissertation empirically answers these three research questions in order to aid firms on their travel towards co-production success. Chapter 2 looks at expected co-production value to offer more insight in the customer usage decision. Next, Chapter 3 examines how the quality contributions of the different actors in co-production affect customer satisfaction and continued use. In addition, Chapter 3 offers a first insight into the management of customer performance by investigating the role of customer socialization. Chapter 4 then digs further into the issue of shaping customer performance by assessing the effect of co-production task design. Finally, Chapter 5 integrates the findings and offers several practical guidelines to manage co-production initiatives for success. Together, these chapters provide firms specific guidance on how to develop co-production initiatives that benefit them as well as their customers. A more detailed account of the different chapters is presented in the next section.

## **1.5 OVERVIEW OF STUDIES**

This section outlines the structure and content of the remainder of this dissertation, based on the three co-production challenges. Specifically, the next paragraphs describe the research contributions of the different chapters and explain how these chapters are linked to each other and to the dissertation's main goal. Figure 5 presents the overall structure of this doctoral dissertation.

**Figure 5:** Overall dissertation structure



### 1.5.1 Attracting customers

A primary challenge in the implementation of a successful co-production option is attracting customers (Meuter et al., 2005). Without sufficient customers, firms can never reap the enticing economic benefits of co-production. Regrettably, despite the claimed advantages for both the customer and the firm, many co-production initiatives experience disappointing adoption rates (Curran & Meuter, 2007; Weijters et al., 2007).

The value customers anticipate to receive plays a key role in their decision to co-produce (Etgar, 2008; Rodie & Kleine, 2000). Following Zeithaml's (1988) customer value definition, customers are only inclined to co-produce when the expected benefits of co-production exceed the foreseen costs. Further, given the competitive marketplace, the co-production initiative must provide more value than the full-service option as well as outperform competing co-production offers (Olsen, 2002). This requires an understanding of the co-production elements that foster customer value as well as the elements that detract from it.

Unfortunately, prior co-production research fails to take into account the full richness of the value concept (e.g., Yim et al., 2012), limits itself to a conceptual discussion (e.g., Etgar, 2008) or focuses on one specific co-production stage (e.g., Dabholkar and Bagozzi, 2002; Franke, Keinz and Steger, 2009). In response to this research gap, the first objective of this dissertation, elaborated in **Chapter 2**, is to **develop and empirically test an integrative conceptualization of customer co-production value**. First, an extensive review of the co-production literature uncovers potential customer benefits and costs. Second, in an exploratory qualitative study, customer interviews are conducted to enhance the co-production value model and provide an initial understanding of the salience of the uncovered co-production benefits and costs. Finally, a large-scale survey study quantitatively evaluates the developed co-production value conceptualization and unravels the distinct effects of the benefit and cost dimensions on customers' co-production choice. Since the stage of production participation determines the nature of the co-production task, the qualitative and quantitative investigation cover the different stages at which



customers can engage in co-production (i.e., the design, manufacturing and distribution stage) (Atakan et al., 2014; Etgar, 2008).

This way, Chapter 2 extends existing literature and managerial understanding by identifying the various co-production value dimensions relevant in the distinct stages of co-production activity. Additionally, the differential impact of these value dimensions on customers' intent to co-produce is revealed. Overall, this aids firms in effectively and efficiently designing and promoting attractive co-production experiences, thereby persuading customers to co-produce. As such, a first step towards profitable co-production initiatives is taken.

### **1.5.2 Fostering effective customer performance**

The second challenge in implementing beneficial co-production activities concerns the effective management of customer performance. By performing core production tasks, customers profoundly affect the co-production outcome, their own satisfaction and, eventually, the firm's bottom line (Bettencourt et al., 2002; Lengnick-Hall, 1996). Successful co-production experiences for the firm and the customer, thus, necessitate customer contributions of a minimum quantity and quality (Greer, 2015; Tax et al., 2006). Hence, it is absolutely vital for firms to gain insight in how they can proactively shape their customers' co-production contributions.

Nonetheless, while research consistently acknowledges the primary role of the customer (e.g., Bettencourt et al., 2002; Dong et al., 2014; Lengnick-Hall et al., 2000), studies on the determinants of effective customer performance are relatively scant (Ford & McColl-Kennedy, 2015). Responding to this gap in literature the second research objective includes **how to enhance customers' co-production performance**. Because customers engaged in co-production become partial employees of the firm, human resource management theories form promising avenues to examine the management of customers in co-production (Bowers & Martin, 2007; Halbesleben & Stoutner, 2013). Recognizing the criticality of adequate customer contributions, **both Chapter 3 and Chapter 4** build on this idea to investigate how firms can bring customer performance under managerial control.

Since Tax et al. (2006) suggest leveraging customer role readiness to avoid below par performance, **Chapter 3 covers the application of socialization theory** to the co-production domain. Socialization describes the process by which new employees acquire the necessary skills, knowledge and attitudes to function effectively (Tang, Liu, Oh, & Weitz, 2014). Similar to new employees, customers need to learn the new behaviours and competences that are required to effectively perform their novel co-production role (Groth, 2005; Halbesleben & Stoutner, 2013). Customers must possess a clear understanding of their role (i.e., role clarity), belief in their abilities (i.e., self-efficacy) and be highly motivated (i.e., motivation) to become proficient co-producers (Bettencourt et al., 2002; Lengnick-Hall, 1996). A notable advantage of these three socialization indicators is their actionability, meaning that they can be influenced by organizational programmes and tactics (Meuter et al., 2005).

Additionally, as Tax et al. (2006) also point towards the importance of service redesign for preventing customer failure, the subject of **Chapter 4 entails how to design the co-production task** to elicit effective customer participative behaviours during co-production. To achieve this, the Job Demands-Resources theory from organizational literature (Bakker & Demerouti, 2007) is adapted to the co-production context. The resulting Co-production Demands-Resources model specifies how both positive and negative task elements (i.e., perceived organizational support, quantitative and qualitative workload) interact to influence customers' wellbeing (i.e., experienced strain and task engagement) and, in turn, their in-role and extra-role participative behaviours. Interestingly, as task design falls under direct firm control, the empirical model investigation suggests several organizational actions to improve customer wellbeing and, subsequently, customer participative behaviours. Further, by incorporating customer wellbeing in the model, this chapter sheds light on the under researched psychological consequences of co-production for customers themselves (Guo et al., 2013).

Though both Chapter 3 and Chapter 4 touch on the issue of enhancing customer co-production performance, their contributions differ. Specifically, Chapter 4 digs deeper into certain relevant research topics. First, where Chapter 3 only focuses

on required task performance (i.e., in role-behaviour), the study in Chapter 4 includes, next to in-role behaviour, extra-role behaviour (i.e., discretionary customer behaviours). Though customers' in-role quality inputs are necessary for successful task completion (Yi & Gong, 2013), extra-role behaviours benefit the firm and support an effective organizational functioning (Groth, 2005). Second, customer socialization in Chapter 3 mainly takes place at the start of the co-production experience and focuses on customers who are relatively inexperienced with the co-production option (Mills & Morris, 1986). In contrast, Chapter 4 presents task design as an effective way to shape customer behaviours during the entire co-production process. Together, these chapters offer strategies to effectively manage customers throughout the different phases of the co-production experience. Third, Chapter 3 elaborates on the beneficial consequences of effective customer performance for the customer and the firm, thereby improving our understanding of the mutually beneficial nature of co-production. On the other hand, Chapter 4 enhances our knowledge on the psychological effects of firm actions on customers by including customer task engagement and experienced strain. Besides merely stimulating customer performance, Chapter 4 pays attention to customers' personal wellbeing, thereby making customer management tactics agreeable for the customer.

Summarized, Chapter 3 and Chapter 4 complement theoretical and practical knowledge by enhancing managerial control over customer co-production contributions. Both examine different but complementary organizational strategies to stimulate high performance. As customer behaviours strongly affect co-production outcomes, customer evaluations and, eventually, firm financial performance, these chapters contribute substantially to the development of viable and successful co-production options.

### **1.5.3 Stimulating continued co-production use**

Though attracting customers to the firm's co-production option is essential, it is not enough for sustained co-production success. Continued customer usage forms the key to long-term viability (Wang et al., 2013). Therefore, the third prominent challenge includes turning initial users into repeated users. Assuring a satisfying customer experience via high-quality participant contributions lies at

the heart of this transition (Ennew & Binks, 1999; Yim et al., 2012). Consequently, to develop profitable initiatives, co-production managers require insight in the various quality determinants of customer satisfaction and ongoing use.

However, despite its competitive salience, extant literature provides inconclusive evidence for the impact of co-production quality on customer evaluations. Previous studies only focused on the effects of customer technical inputs (e.g., Auh et al., 2007; Yim et al., 2012). In reaction to this research hiatus, **Chapter 3** comprises the deeper investigation of **what drives continued co-production use**. Specifically, besides examining the effect of socialization on customer performance, Chapter 3 builds on quality and co-production literature to put forward the quality inputs of the different co-production participants as antecedents of customer satisfaction (Bolton & Saxena-Iyer, 2009; Ennew & Binks, 1999).

Innate to the term co-production, co-production quality is dependent on the inputs from several parties (Bendapudi & Leone, 2003). First, by performing one or more production tasks, customers strongly affect the co-production outcome and subsequent co-production evaluations (Bitner et al., 1997; Lengnick-Hall, 1996). Second, employees can educate customers and assist them with their production tasks (Hilton et al., 2013). Third, the firm provides necessary production materials and equipment (Aggarwal & Basu, 2014). Hence, co-production includes the mutual effort of the customer, the firm and (often) its employees (Bolton & Saxena-Iyer, 2009; Ennew & Binks, 1999). Consequently, to gain a richer picture of the effects of co-production, the quality contributions of these three actors should be taken into account simultaneously (Halbesleben & Stoutner, 2013).

Moreover, customers, firms and employees affect quality in two different ways. Technical quality inputs cover *what* these parties provide during co-production (e.g., information and skills), while functional quality describes *how* they contribute (e.g., being friendly and respectful) (Grönroos, 1995; Kelley, Donnelly, & Skinner, 1990). Analogous, Chapter 3 makes a distinction between

process and outcome satisfaction, as both determine and differentially impact customers' further co-production evaluations (Bendapudi & Leone, 2003). Finally, taking into account that customers may have a relationship with multiple, competing firms, continued co-production use is studied in terms of future use of the firm's offering and general co-production use. The resulting, comprehensive conceptual model is quantitatively tested through a survey among customers of a Belgian DIY firm.

In summary, by combining the different actors' quality contributions, main satisfaction aspects and continued use intentions in an overarching framework, Chapter 3 captures a more complete picture of the co-production - satisfaction link. The findings contribute to theory and practice by offering a better understanding of when and how co-production affects customer evaluations. This way, they aid managers in developing co-production formats for sustained success, thereby earning a satisfactory return on their co-production investment.

Finally, **Chapter 5** summarizes the main findings of the empirical studies in this dissertation and presents a roadmap for the development of successful co-production initiatives. Further, this final chapter puts forward several ideas for future research in the field of co-production.

Combined, the five chapters bring us one step further in understanding co-production and the factors driving its success. Additionally, by evaluating constructs that are advantageous to customers (i.e., value, satisfaction and wellbeing) as well as firms (i.e., customer usage intent, repeated use and participative behaviours), this dissertation supports the idea of co-production as a mutually beneficial option.



**CHAPTER 2**  
**TO CO-PRODUCE OR NOT TO CO-PRODUCE?**  
**AN INTEGRATIVE CONCEPTUALIZATION OF CO-PRODUCTION VALUE**

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## **CHAPTER 2**

### **TO CO-PRODUCE OR NOT TO CO-PRODUCE?**

#### **AN INTEGRATIVE CONCEPTUALIZATION OF CO-PRODUCTION VALUE**

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##### **ABSTRACT**

Firms increasingly provide customers the opportunity to co-produce as this forms a potential source of competitive advantage. However, they can only reap the economic gains if customers actually choose the firm's co-production initiative. Essential in this decision is the value customers expect to create, which involves weighing the expected benefits against the anticipated costs. Customers only find co-production attractive if the resulting balance is positive and the firm's co-production option delivers more value than full-service alternatives and competing co-production initiatives. Unfortunately, comprehensive empirical research on co-production value is lacking. Therefore, we conducted an extensive literature review, customer interviews and a large-scale survey in three distinct co-production stages (i.e., design, manufacturing and distribution) to develop an integrative co-production value conceptualization and examine the relevance of the discovered value dimensions for customer attraction. According to the findings, both benefits (i.e., efficiency, excellence, play and social benefits) and costs (i.e., economic risk, personal investment and social risk) significantly affect customers' intention to co-produce. Interestingly, play, an intrinsic benefit, arises as the most prominent dimension of co-production value in each production stage. Besides increasing the benefits of co-production, reducing the costs for the customer - especially economic risk - proves to be essential in stimulating co-production.

## 2.1 INTRODUCTION

Today, you – as a customer – have the choice: to co-produce or not to co-produce? In more and more stores you can self check-out your products or proceed via the traditional staffed check-out. You can buy clothes, electronics and books online or go to a physical retailer. You can self-design your dress, shoes and bag or purchase a standard good. Want to install or build something in your home (e.g., a ventilation system or a garden shed)? You can purchase a construction kit and do it yourself or you can hire a professional. Why exactly would you select one option over the other? What drives your decision?

This is a strategic question for firms as co-production, indicating customers' active participation in the production of the core offering (Troye & Supphellen, 2012), entails the promise of considerable economic advantages, such as productivity gains, reduced labour costs and a higher market share (Auh et al., 2007; Shamdasani et al., 2008). However, co-production initiatives can only be successful if firms design them with customer co-production value in mind, rather than from a cost-cutting logic (Chan et al., 2010). Co-production value is the result of an evaluation of co-production benefits and costs by the customer and predominantly guides customers' decision-making (Etgar, 2008). When choosing an alternative, customers anticipate the value they expect to create and then consciously decide to opt for the co-production activity or not (Jia et al., 2012; Woodall, 2003). Specifically, they only find co-production attractive when the anticipated benefits outweigh the expected costs (Rodie & Kleine, 2000). As a result, facilitating positive value is essential for any co-production initiative to entice customers and, thus, to be profitable (Franke et al., 2009). More specifically, as customers in the competitive marketplace actively choose between different options, offering more value than full-service alternatives and competing co-production initiatives is key to attract customers and gain a return on co-production investment (Olsen, 2002).

Hence, insight in the composition of customer co-production value is not merely of theoretical interest; it represents a primary success factor. Nevertheless, an elaborate understanding of what creates or destroys value for the customer is

lacking. A review of extant literature reveals multiple unresolved issues. First, co-production studies that discern both customer benefits and costs are mostly conceptual in nature (e.g., Etgar, 2008). In line with the Return on Marketing notion (cf. Rust et al., 2004), this lack of empirical research severely hampers managers' ability to efficiently and effectively allocate their limited marketing resources to co-production development and promotion. Second, the empirical investigations that are available only cover particular customer benefits of co-production (e.g., Collier and Sherrell, 2010; Curran and Meuter, 2007; Dong et al., 2008). This is a critical omission as participation in co-production activities requires customers' time and effort (Bendapudi & Leone, 2003; Etgar, 2008), and, thus, is not costless. Third, most value inquiries are limited to a specific co-production stage, such as the design stage (e.g., Franke et al., 2009; Schreier, 2006), the manufacturing stage (e.g., Mochon et al., 2012; Troye and Supphellen, 2012) or the distribution stage (e.g., Dabholkar and Bagozzi, 2002; Meuter et al., 2005). This only provides a restricted picture as the different form and nature of these stages influence customer evaluations (Atakan et al., 2014) and, therefore, can affect the relevance of the co-production value dimensions.

In light of these research gaps, the current chapter aims to extend understanding of the sources of customer value expected from co-production. To achieve this, this study 1) develops a comprehensive co-production value conceptualization from the customer's perspective, 2) empirically assesses this conceptualization in light of customer attraction and 3) compares it across co-production stages. As such, this chapter contributes to extant marketing theory and practice in multiple ways.

First, to our best knowledge, this work is a first rigorous attempt to provide an integrative co-production value conceptualization, identifying both the benefits and costs that drive customers' co-production choice. As customer value and firm financial value represent the two sides of the value creation coin (Gupta & Lehman, 2005), insight in the various sources of customer co-production value is critical for developing successful co-production strategies.

Second, by empirically analyzing the proposed co-production value conceptualization in relation to customers' co-production decision, we shed light on the relevance of the uncovered benefit and cost dimensions for attracting customers. Consequently, we can guide managers in efficiently prioritizing co-production (re)design efforts to the most impactful value elements and aid them to develop effective value propositions in order to optimize customer attraction. Third, the quantitative examination provides the opportunity to develop a classification of co-production costs. While we can rely on Holbrook's (1999) extensive typology for the customer benefit classification, an integrative conceptualization of customer costs is lacking (Papista & Krystallis, 2013).

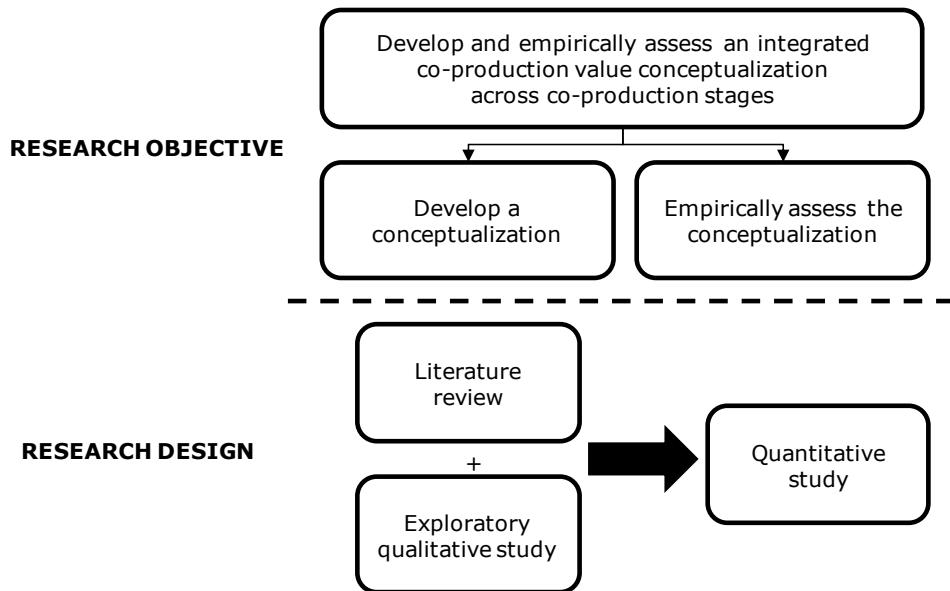
Fourth, we investigate and compare co-production value across three stages of the production activity chain, namely the design, manufacturing and distribution stage (Etgar, 2008). As the form of customers' co-production activities varies between these stages (Atakan et al., 2014), different value dimensions might affect customers' intention to co-produce and directions for developing attractive co-production experiences might depend on the specific co-production stage. Finally, from a practical perspective, firms can apply the developed value conceptualization as a diagnostic tool for evaluating their co-production activities, relative to the competition, and pinpointing areas for improvement.

The remainder of this paper is organized as follows. First, we introduce the study's research design. Second, we review co-production literature to uncover possible customer co-production drivers and barriers. Third, we discuss the exploratory qualitative study, conducted to further develop a co-production value conceptualization. Next, we outline the procedure and results of the quantitative survey research, designed to empirically test this conceptualization. The following section presents several implications for academics and practitioners. The paper concludes with some directions for further research.

## **2.2 OVERALL RESEARCH DESIGN**

To arrive at an integrative co-production value conceptualization, the current chapter follows a three-step research design (see Figure 6).

**Figure 6:** Co-production value research design



First, we undertake an extensive review of the existing co-production literature to identify potential co-production benefits and costs for customers. Additionally, we attempt to aggregate the uncovered benefits and costs in a validated conceptual framework (Ulaga & Eggert, 2006; Workman, Homburg, & Gruner, 1998).

Second, we carry out an exploratory qualitative study to verify and, where possible, supplement the list of co-production benefits and costs from the literature review. To this end, we conduct scenario-based customer interviews across three co-production stages (i.e., design, manufacturing and distribution). This sheds light on the nature of co-production value from the customer's perspective as it does not impose predefined value elements on the respondent (Woodruff & Gardial, 1996). Further, this qualitative step yields a preliminary understanding of the relevance of the observed value elements. Combining the findings of the literature review and the qualitative investigation leads to an initial co-production value conceptualization.

Third, we quantitatively assess the developed co-production value conceptualization across co-production stages by means of a large-scale

customer survey. This way, we can empirically deduce the dimensionality of co-production costs. In addition, by analyzing co-production value in a larger nomological network, the quantitative examination validates our co-production value conceptualization and determines, across the three stages, the relative importance of the different benefit and cost dimensions for attracting customers.

## **2.3 LITERATURE REVIEW**

While the success of co-production ventures like IKEA and Build-A-Bear underscore that co-production can be a profitable business strategy, introducing a co-production activity is no guarantee for success (Curran & Meuter, 2007; Weijters et al., 2007). The enticing competitive advantages can only be realized if customers actually choose the firm's co-production option. In this choice, the value customers expect from the co-production activity, relative to full-service and competing options, plays a fundamental role (Etgar, 2008). Hence, to develop attractive co-production activities, firms must gain an elaborate understanding of the value customers anticipate from a co-production initiative.

### **2.3.1 Customer value**

Customer value, entailing the trade-off between an offering's benefits and costs by the customer (Zeithaml, 1988), forms the cornerstone of all marketing activities (Gallarza, Gil-saura, & Holbrook, 2011; Holbrook, 1999). According to value theory, the value customers anticipate from market offerings strongly affects their attitudes and behaviours (Cronin, Brady, & Hult, 2000; Dodds, Monroe, & Grewal, 1991; Sheth, Newman, & Gross, 1991; Zeithaml, 1988).

Zeithaml's (1988) conceptualization of value as a trade-off between benefits and costs is consistent with Thaler's (1985) seminal work on mental accounting theory, which states that value equals net benefits, being the sum of multiple attributes. According to Cronin, Brady, Brand, Hightower and Shemwell (1997), customer value as an additive function of benefits and costs (i.e., net benefits) recognizes the integrative nature of benefits and costs and takes the compensatory trade-off between them into account. Additionally, multiple benefits may play a role in customer decision making (Thaler, 1985). This is

crucial as multidimensionality, referring to the existence of several interrelated components or dimensions, forms a key characteristic of customer value (Leroi-Werelds, Streukens, Brady, & Swinnen, 2014). This multidimensional nature concerns both the benefits and costs involved.

Further, a close inspection of the cost elements observed in previous value research (e.g., Leroi-Werelds et al., 2014; Ruiz, Gremler, Washburn and Carrion, 2008) reveals that costs, next to benefits, form a separate category in the value constellation. Put differently, benefits and costs are distinct constructs rather than opposite ends of a single continuum. This follows Kahneman and Tversky's (1979) work on prospect theory, which holds that individuals are more sensitive to negative information than to positive information, and suggests the need for so-called dual-factored constructs (Cenfetelli & Schwarz, 2011).

Dual-factored constructs are related in nature but opposite in valence. They exist as two independent, unipolar continua rather than a single, bipolar continuum with a unitary midpoint. Either construct can have different and potentially asymmetric effects on the same outcome. In a value context, this idea is in line with Kano's model (Khalifa, 2004). Including benefits and costs as dual-factored constructs has three implications. First, costs are not necessarily the opposite of benefits and can exist independently. Hence, customer evaluations of service initiatives can be diverse combinations of benefits and costs. Second, and related to the first implication, an individual can hold perceptions of both benefits and costs simultaneously. Third, from a modelling perspective, the use of dual-factored constructs acknowledges that related benefits and costs can have independent effects on an outcome variable.

### **2.3.2 Co-production value**

Also, in a co-production context, customers' preference for and choice of co-production offerings depend strongly on the value these options are believed to entail (Jia et al., 2012; Lee & Allaway, 2002; Overby & Lee, 2006). Congruent with Zeithaml's (1988) definition of customer value, Etgar (2008) states that:

*“consumers perform a cost-benefit analysis evaluating the benefits [...] they expect to accrue from co-production, and weighing them against the relevant costs of engaging in such activities. The end result of this analysis is a conscious decision either to move into and engage in co-production or else to avoid such involvement” (p. 103).*

Hence, facing the decision to co-produce, customers weigh the expected benefits against the expected costs and are only inclined to co-produce when the resulting balance is positive (Curran et al., 2003; Rodie & Kleine, 2000). Further, to choose a firm’s co-production option, this option must provide more value than the full-service alternative as well as outperform competing co-production initiatives (Olsen, 2002; Ulaga & Eggert, 2006).

So far, the literature has put forward a diversity of benefits and costs (potentially) relevant to customers in deciding whether to co-produce or not (e.g., Etgar, 2008; Jia et al., 2012). Following Ulaga and Eggert (2006) and Workman et al. (1998), we start our quest for an integrative coproduction value conceptualization by aggregating the co-production benefits and costs from extant literature in an existing conceptual model.

### **2.3.3 Co-production benefits**

Benefits that are often cited in co-production research include monetary benefits (e.g., Bendapudi & Leone, 2003), increased customization (e.g., Chan et al., 2010), higher perceived control (e.g., Auh et al., 2007) and enjoyment (e.g., Yim et al., 2012). In addition, previous literature (e.g., Etgar, 2008; Peters et al., 2012) refers to a variety of other benefits (e.g., improved quality, increased status and a feeling of accomplishment), albeit with less frequency.

To structure this multitude of benefits in a clear and manageable way, Holbrook's (1999) typology is extremely promising for three reasons. First, this typology explicitly acknowledges the multidimensional nature of customer benefits (Leroi-Werelds et al., 2014). Second, Holbrook’s approach offers the most extensive overview of customer benefits, thereby minimizing the risk of overlooking relevant benefit types (Sánchez-Fernández, Iniesta-Bonillo, &



Holbrook, 2009; Sánchez-Fernández & Iniesta-Bonillo, 2007). Third, Holbrook discerns between extrinsic and intrinsic benefits. Following studies on SSTs (e.g., Dabholkar and Bagozzi, 2002; Meuter et al., 2005; Overby and Lee, 2006) and customer participation (e.g., Yim et al., 2012), customers can create functional benefits (e.g., time savings) by co-producing as well as enjoy the co-production experience itself. This is in line with Etgar (2008) who acknowledges the suitability of Holbrook's typology for co-production settings.

According to Holbrook's (1999) typology, benefits can be structured along three key dimensions: (1) extrinsic versus intrinsic, (2) self-oriented versus other-oriented and (3) active versus reactive (Holbrook, 1996, 1999). First, the extrinsic – intrinsic dimension contrasts consumption as a means to an end with consumption as a self-justifying end in itself. Hence, extrinsic benefits appreciate an offering from a functional, utilitarian or instrumental perspective while intrinsic benefits are prized for their own sake. Second, the self-oriented versus other-oriented distinction compares the effect an offering has on yourself with the effect it has on others. Finally, the active-reactive difference discerns situations where the customer acts upon an object from instances where an object acts upon the customer. Active benefits flow from the mental or physical manipulation of an offering, whereas reactive benefits entail a more distant appreciation. Combining these three dimensions results in eight benefit types: efficiency, excellence, status, esteem, play, aesthetics, ethics and spirituality (see Figure 7). However, given the notable challenges in operationalizing some of these separately (Holbrook, 1999), we follow prior research and create the category of social benefits (combining status and esteem) as well as the category of altruistic benefits (combining ethics and spirituality) (Holbrook, 2006; Leroi-Werelds et al., 2014; Sánchez-Fernández et al., 2009).

**Figure 7:** Holbrook's (1999) benefit typology

		Extrinsic	Intrinsic
<b>Self-oriented</b>	<b>Active</b>	Efficiency	Play
	<b>Reactive</b>	Excellence	Aesthetics
<b>Other-oriented</b>	<b>Active</b>	Status	Ethics
	<b>Reactive</b>	Esteem	Spirituality

Social benefits	Altruistic benefits
-----------------	---------------------

Applying the resulting six benefit types to co-production leads to the following definitions. Efficiency concerns customers' active choice to co-produce in order to reach a self-oriented end, for example, saving money or time. Excellence involves customers' reactive appreciation of the co-production experience to achieve a self-oriented goal, such as quality improvements. Social benefits arise when customers use their own consumption behaviour (i.e., to co-produce) as a means to impress others or enhance their image in their own eyes. Turning to the intrinsic benefit types, play entails the active pursuit of self-oriented rewards such as fun or adventure. The reactive counterpart of play, aesthetics, represents the self-oriented enjoyment of the co-production experience, for instance, as a source of beauty. Finally, we speak of altruistic benefits when a customer cares about how his/her consumption behaviour influences others and regards this as a self-justifying end in itself.

**Classification of co-production benefits**

To investigate whether and how the co-production benefits fit Holbrook's (1999) value typology, we proceeded as follows. First, we examined extant literature for co-production benefits. To this end, we searched multiple academic databases, including EBSCOhost, Google Scholar and Web of Science using combinations of the following keywords: co-production, self-service, self-service technology, customer participation, value, benefit, advantage, driver and motivation. In total, this literature review uncovered 24 unique co-production benefits (see Table 3). Second, for each discovered benefit element, a definition was drawn from existing work (see appendix A). Next, based on these benefit definitions and the definitions of Holbrook's dimensions, three judges independently

classified each co-production benefit according to Holbrook's (1999) typology. The interjudge reliability, calculated by the percentage agreement measure, equalled 81.8 per cent, which is deemed satisfactory (Keaveney, 1995). Afterwards, every discrepancy in categorization was resolved through discussion, and the classification was iteratively amended until an agreement was reached among the authors.

**Table 3:** Co-production benefits from literature (classified via Holbrook's (1999) typology)

		Extrinsic	Intrinsic
Self-oriented	Active	<p><i>EFFICIENCY</i></p> <p><b>Monetary benefits</b> Auh et al. (2007); Bendapudi and Leone (2003); Etgar (2008)</p> <p><b>Time savings</b> Curran and Meuter (2007); Dabholkar (1996); Meuter et al. (2005)</p> <p><b>Higher perceived control</b> Auh et al. (2007); Chan et al. (2010); Etgar (2008)</p> <p><b>Learning benefit</b> Etgar (2008); Nambisan and Baron (2009)</p> <p><b>No personal contact</b> Bateson (1985); Curran et al. (2003); Rodie and Kleine (2000)</p> <p><b>Reduced risk</b> Etgar (2008); Chan et al. (2010); Lusch et al. (2007)</p>	<p><i>PLAY</i></p> <p><b>Fun/Enjoyment</b> Etgar (2008); Meuter et al. (2005); Yim et al. (2012)</p> <p><b>Freedom/Independence</b> Etgar (2008); Meuter et al. (2005); Rodie and Kleine (2000)</p> <p><b>Excitement/Adventure</b> Etgar (2008); To, Liao and Lin (2007)</p> <p><b>Personal challenge</b> Jia et al. (2012); Peters et al. (2012)</p> <p><b>Intellectual stimulation</b> Nambisan and Baron (2009); Peters et al. (2012)</p> <p><b>Variation/Deviation from routine</b> Etgar (2008)</p>
	Reactive	<p><i>EXCELLENCE</i></p> <p><b>Improved quality</b> Chan et al. (2010); Rodie and Kleine (2000); Xie et al. (2008)</p> <p><b>Increased customization</b> Auh et al. (2007); Chan et al. (2010); Etgar (2008)</p>	<p><i>AESTHETICS</i></p> <p><b>Aesthetics</b> Etgar (2008); Jia et al. (2012); Peters et al. (2012)</p>
Other-oriented	Active & reactive	<p><i>SOCIAL BENEFITS</i></p> <p><b>Social esteem and status</b> Etgar (2008); Meuter et al. (2005); Peters et al. (2012)</p> <p><b>Self-esteem (Self-image)</b> Jia et al. (2012); Peters et al. (2012); Xie et al. (2008)</p> <p><b>Self-confidence</b> Dong et al. (2008); Etgar (2008); Meuter et al. (2005)</p> <p><b>Sense of accomplishment</b> Dong et al. (2008); Meuter et al. (2005); Peters et al. (2012)</p> <p><b>Pride</b> Mochon et al. (2012); Peters et al. (2012); Xie et al. (2008)</p> <p><b>Self-fulfilment</b> Dong et al. (2008); Meuter et al. (2005); Peters et al. (2012)</p> <p><b>Self-expression</b> Etgar (2008); Peters et al. (2012); Xie et al. (2008)</p> <p><b>Uniqueness value</b> Etgar (2008); Mochon et al. (2012); Schreier (2006)</p>	<p><i>ALTRUISTIC BENEFITS</i></p> <p><b>Ethics and spirituality</b> Etgar (2008)</p>

Note: Maximum three references per benefit element.

#### **2.3.4 Co-production costs**

As inherent in its definition (Etgar, 2008), to capture co-production value in its entirety, we must also examine the cost side and recognize that co-production is not unequivocally positive (Auh et al., 2007). Prior studies acknowledge that participating in production involves certain costs for the customer (e.g., Bateson, 1985; Bendapudi and Leone, 2003; Etgar, 2006). More specifically, a literature review identified seven potential co-production costs (see Table 4).

Existing research typically mentions time costs (e.g., Etgar, 2008) and physical and mental effort (e.g., Xie et al., 2008). Nonetheless, an extensive literature search, following the same procedure as for the co-production benefits, unveiled several other (potential) co-production costs. For instance, some people see the loss of personal contact when using self-service technologies (SSTs) as a disadvantage (Dabholkar, Bobbitt, & Lee, 2003). For other individuals, co-production is associated with cognitive costs (Curran et al., 2003). They experience stress or anxiety from engaging in the new, unfamiliar co-production task. Further, engaging in co-production entails certain risks (Crespo et al., 2009; Etgar, 2008). For example, the outcome might not be as desired and therefore fail to provide the expected benefits. Customers might also risk social embarrassment when they are not able to successfully complete the co-production task. Appendix A provides a definition of each co-production cost element.

**Table 4:** Co-production costs from literature

<i>CO-PRODUCTION COSTS</i>
<b>Monetary costs</b> Etgar (2008)
<b>Increased performance, financial, physical and/or privacy risk</b> Bateson (1985); Etgar (2008); Crespo et al. (2007)
<b>No personal contact</b> Curran et al. (2003); Dabholkar (1996); Dabholkar et al. (2003)
<b>Time costs</b> Bendapudi and Leone (2003); Etgar (2008); Xie et al. (2008)
<b>Cognitive costs</b> Campbell et al. (2011); Curran et al. (2003); Van Beuningen et al. (2009)
<b>Physical effort</b> Dabholkar and Bagozzi (2002); Etgar (2008); Xie et al. (2008)
<b>Mental effort</b> Dabholkar and Bagozzi (2002); Etgar (2008); Xie et al, (2008)
<b>Increased sociopsychological risk</b> Bateson (1985); Etgar (2008); Crespo et al. (2007)

*Note:* Maximum three references per cost element.

### ***Classification of co-production costs***

In early work, Holbrook (1999) implicitly considered value as a cost-free benefit and his typology did not reflect the cost side of the value equation. As a result, some researchers interpreted his classification as a benefit typology and contrasted it with the relevant costs to arrive at a measurement of customer value (e.g., Gallarza and Gil Saura, 2006). However, in a more recent study, Holbrook and his co-authors (Sánchez-Fernández et al., 2009) integrated costs under efficiency, as this dimension represents the get-versus-give aspects of consumption. Nevertheless, this still leaves only one general category that comprises all costs. A further examination of the value literature also does not yield a commonly acknowledged or validated cost typology. Existing customer value research merely examines individual cost elements (e.g., time, effort or risk) (e.g., Gallarza, Arteaga and Gil-Saura, 2013; Gallarza and Gil Saura, 2006).

Thus, unlike for the benefits, a commonly acknowledged or validated cost typology is lacking (Papista & Krystallis, 2013). Nonetheless, the diversity of cost elements proposed in previous co-production research points towards the existence of multiple cost dimensions. Therefore, we empirically derive a framework that efficiently structures the customer costs associated with co-production. This helps firms focus their attention and limited resources on a manageable number of cost dimensions. To this end, we conduct a post-hoc analysis on the cost items in the customer survey data collected during the quantitative phase of our study.

### **2.3.5 Discussion**

In line with customer value as a trade-off between benefits and costs (Zeithaml, 1988), our review of the co-production literature finds a multitude of both customer co-production benefits and costs. Holbrook's (1999) typology provides a clear structure for the benefits and clarifies their multidimensional nature. Given the great diverseness of uncovered co-production cost elements, the literature hints at a multidimensional character of costs as well. However, since no validated typology is available to structure the variety of co-production costs, a classification must be empirically derived.

## **2.4 EXPLORATORY QUALITATIVE STUDY**

To validate and potentially extend the literature list of co-production costs and benefits as well as gain a first indication regarding the salience of these value elements, we proceed with an exploratory qualitative study. More specifically, we conducted a series of customer interviews across the three stages at which customers can engage in co-production (i.e., design, manufacturing and distribution).

### **2.4.1 A multi-stage perspective**

Co-production is defined as customers' active participation in the production of the end offering. As the production process consists of multiple stages (Grönroos, 2011; Van Raaij & Pruyn, 1998), customers can co-produce offerings

at several distinct stages (Etgar, 2008). According to Atakan et al. (2014), the nature of the co-production task varies depending on the stage of participation. First, the design stage entails the planning of a product's features and characteristics and as such determines the offering's visual and functional form (e.g., designing your vacation and designing your shoes via NIKEiD). Second, the manufacturing and assembly stage involves the physical creation of the offering via the processing of raw materials and/or assembly of diverse components. Most do-it-yourself (DIY) tasks fall under this heading (e.g., painting and laying laminate yourself). Third, in the distribution stage, the customer takes control of the flow and storage of products, services and information, thereby covering many SSTs (e.g., self check-out and online buying). Considering these distinctions and the notion that customer value is context-dependent (Holbrook, 1999), the relative significance of value dimensions may differ between co-production stages. Hence, by investigating co-production value across the design, manufacturing and distribution stage, we cover the extensive spectrum of co-production activities and explore the generalizability of our results.

#### **2.4.2 Qualitative research design**

To elicit the benefits and costs customers associate with co-production, we conducted a series of personal interviews. We opted for a scenario-based approach as this provides control over situational variables and reduces biases (Bateson, 1985; Dong et al., 2008; Roggeveen, Tsiros, & Grewal, 2012). Each scenario simulates the choice customers face between co-production or no co-production (i.e., full service), as in a competitive environment customers evaluate the value of an option relative to its alternatives (Babakus, Bienstock, & Van Scotter, 2004; Gale, 1994; Olsen, 2002). The three examined co-production stages are represented by three different settings: (1) planning a road trip (i.e., design stage), (2) assembling a wardrobe (i.e., manufacturing stage) and (3) checking in at an airport (i.e., distribution stage). Since lack of realism is a potential drawback of scenarios (Troye & Supphellen, 2012), we chose settings respondents can relate to and, therefore, readily judge.



The travel planning scenario simulates the planning of a two week road trip to the West Coast of the United States for the respondent and a friend. The respondent can choose one of the travel agent's four fully planned tours or he/she can plan the entire tour him/herself. Only the planning aspect differs between the two options. In the wardrobe assembly scenario, the customer decides to buy a particular wardrobe in a furniture store and finds out that the store offers two options for assembly: either the wardrobe is delivered and assembled by professional store employees or the store delivers a building kit and the customer is responsible for the assembly. This scenario controls for the design and the distribution aspect. The airport check-in scenario pictures the respondent arriving at the airport for a two-week trip to Croatia. Then, he/she is presented the choice between a traditional check-in at the desk or using one of the automated self check-in devices. The full scenarios can be found in Appendix B of this chapter.

The developed scenarios were thoroughly pretested by a small sample of doctoral students from the marketing department. Slight modifications were implemented according to their input. During the actual customer interviews, no participants reported any difficulties with the final scenarios.

### **2.4.3 Data collection and analysis**

The research took place in Belgium, where we recruited respondents from a convenience sample of adult volunteers from the first author's circle of colleagues and acquaintances. Recruitment continued until theoretical saturation occurred and additional interviews uncovered no new data (Strauss & Corbin, 1998). To ensure the identification of both positive and negative value elements, we proceeded with data collection until an adequate number of respondents preferring the co-production option as well as favouring the full-service option were reached. Each respondent was randomly presented with two scenarios. This resulted in 19 respondents for the travel planning scenario (i.e., design stage), 20 respondents for the wardrobe assembly scenario (i.e., manufacturing stage) and 18 respondents for the airport check-in scenario (i.e., distribution stage). The sample consisted of slightly more women (54.4%) than men (45.6%), and the participants' age ranged between 22 and 59 years, with an

average of 38.1 years. Also, a wide range of occupational categories were interviewed (e.g., student, blue-collar worker, psychologist and architect). Table 5 provides a summary of the interview respondents.

**Table 5:** Interview respondent characteristics

<b>Gender</b>	<b>Age</b>	<b>Profession</b>	<b>Scenario 1</b>	<b>Scenario 2</b>
Male	53	Architect	Design (C)	Manufacturing (N)
Female	58	Housewife	Design (C)	Manufacturing (C)
Male	27	Unemployed (Architect)	Design (C)	Manufacturing (C)
Female	23	Student	Design (C)	Manufacturing (C)
Female	54	Nurse	Design (C)	Manufacturing (C)
Female	23	Student	Design (C)	Manufacturing (N)
Female	51	Nurse	Design (C)	Manufacturing (N)
Female	24	Student	Design (C)	Manufacturing (C)
Female	47	Office clerk	Design (C)	Manufacturing (N)
Female	24	Student	Design (C)	Manufacturing (C)
Female	51	Housewife	Design (C)	Manufacturing (N)
Male	26	Factory worker	Design (C)	Manufacturing (C)
Male	57	Factory worker	Design (N)	Manufacturing (C)
Male	46	Factory worker	Design (N)	Manufacturing (C)
Male	31	Project manager construction	Design (N)	Manufacturing (C)
Male	54	Bank manager	Design (N)	Manufacturing (N)
Male	33	IT support	Design (N)	Manufacturing (C)
Female	29	Bank clerk	Design (N)	
Male	25	Project manager construction	Design (C)	Distribution (N)
Male	59	High school teacher	Manufacturing (C)	Distribution (N)
Female	26	PhD candidate	Manufacturing (C)	
Female	53	Bank clerk	Manufacturing (N)	
Male	26	PhD candidate	Distribution (C)	
Female	53	Hospital management	Distribution (C)	
Female	52	Lab technician	Distribution (C)	
Male	43	Editor	Distribution (C)	
Male	22	Student	Distribution (C)	
Male	30	Logistics planner	Distribution (C)	
Male	36	IT support	Distribution (C)	
Male	22	IT developer	Distribution (N)	
Female	49	Housewife	Distribution (N)	
Female	23	Student	Distribution (N)	
Female	25	Accountant	Distribution (N)	
Female	29	Social counsellor	Distribution (N)	
Female	27	Psychologist	Distribution (N)	
Female	23	High school teacher	Distribution (N)	
Female	26	PhD candidate	Distribution (N)	
Female	44	Housewife	Distribution (N)	

(C) The respondent preferred the co-production option.

(N) The respondent preferred the no co-production option.

*Note:* Originally our study consisted of four scenario's instead of three. As we removed one in the course of the research, the table indicates only one scenario for the respondents to who we presented this afterwards deleted scenario.

We collected data as follows. First, interviewees were instructed to read the scenario very carefully and picture themselves actually making the described choice between co-production and no co-production. Next, we posed them open-ended questions to arrive at the benefits and costs of co-production:

- Which option would you choose? Why would you choose this option? Why wouldn't you choose the other option? Are there other elements that could influence your choice?
- According to you, what are the differences between the two options? What are the similarities between them?
- According to you, what are the advantages of the first/second option? What are the disadvantages?

These open-ended questions shed light on the nature of co-production value from the customer's point of view without imposing predefined value elements on the respondent, thereby avoiding leaving out salient costs and benefits or including irrelevant ones (Woodruff & Gardial, 1996).

When necessary, we used various probing and clarifying questions (e.g., What exactly do you mean by that?) to prevent misinterpretations. On average, an interview lasted around 15 minutes. Each interview was audiotaped and transcribed verbatim for analysis. Subsequently, we content analyzed the data, whereby the value elements discovered during the literature review (e.g., time savings, pride, fun and mental effort) served as a template for the value category codes. When needed, a new category was created. For each co-production stage, this resulted in a list of benefits and costs associated with co-production.

#### **2.4.4 Qualitative results**

The customer interviews provided preliminary indications regarding the inter-stage (dis)similarities of both the co-production benefits and costs. These are discussed below.

##### ***Co-production benefits***

In each co-production stage, customers anticipated some kind of efficiency, excellence, play and social benefit to result from participating in production. In contrast, we did not find evidence of Holbrook's (1999) aesthetic or altruistic benefit types in any stage. Since extant literature also refers only superficially to these two benefit dimensions, they seem to be of little influence in the co-production value proposition. Further, though some benefits put forward in the literature were not reflected in the interviews (e.g., self-expression), the qualitative findings did not yield any benefits that do not fit the elements derived in our literature review. Thus, no additional benefit dimensions emerged compared to Holbrook's (1999) typology. Turning to the individual dimensions, our study offered the following results (see Table 6).

**Table 6:** Co-production benefits across stages

<i>LITERATURE REVIEW</i>	<i>QUALITATIVE RESEARCH</i>		
	<i>Design stage</i>	<i>Manufacturing stage</i>	<i>Distribution stage</i>
<b>EFFICIENCY</b>			
<b>Monetary benefits</b>	Monetary benefits	Monetary benefits	Monetary benefits
<b>Time savings</b>	/	/	Time savings
<b>Higher perceived control</b>	Higher perceived control	Higher perceived control	Higher perceived control
<b>Learning benefit</b>	Learning benefit	Learning benefit	/
<b>No personal contact</b>	/	/	No personal contact
<b>Reduced risk</b>	/	Reduced risk	/
<b>EXCELLENCE</b>			
<b>Increased customization</b>	Increased customization	Increased customization	Increased customization
<b>Improved quality</b>	/	Improved quality	/
<b>SOCIAL BENEFITS</b>			
<b>Social esteem and status</b>	Social esteem and status	Social esteem and status	/
<b>Self-esteem/ Self-image</b>	Self-esteem	Self-esteem	/
<b>Self-confidence</b>	/	/	/
<b>Sense of accomplishment</b>	Sense of accomplishment	Sense of accomplishment	/
<b>Pride</b>	Pride	Pride	Pride
<b>Self-fulfilment</b>	Self-fulfilment	/	/
<b>Self-expression</b>	/	/	/
<b>Uniqueness value</b>	Uniqueness value	/	/
<b>PLAY</b>			
<b>Fun/Enjoyment</b>	Fun/Enjoyment	Fun/Enjoyment	Fun/Enjoyment
<b>Freedom/ Independence</b>	Freedom/ Independence	/	/
<b>Excitement/Adventure</b>	Excitement/ Adventure	/	/
<b>Personal challenge</b>	Personal challenge	/	/
<b>Variation/Deviation from routine</b>	/	/	/
<b>Intellectual stimulation</b>	/	/	/
<b>AESTHETICS</b>			
<b>Aesthetics</b>	/	/	/
<b>ALTRUISTIC BENEFITS</b>			
<b>Ethics and spirituality</b>	/	/	/

First, the efficiency dimension appears to play a prominent role in the value equation as it was highly cited by respondents in each co-production stage. The efficiency elements "higher perceived control" and "monetary benefits" were observed in all three stages. Every respondent in the manufacturing stage expected "monetary benefits", while "higher perceived control" received less cites. On the other hand, "higher perceived control" occupied a more notable role in the design stage. In the distribution stage, both benefits were only scantily named. Interestingly, though SSTs do not normally award price reductions (e.g., self-scanning and self check-out), a few interviewees only found it fair to receive a discount for handling the airport check-in themselves. Further, in the design and manufacturing stage, some interviewees anticipated enhancing their skills so they can work more efficiently in the future. As one respondent noted: *"Your knowledge from assembling it. If you buy similar things in the future...Yeah, you always learn something from it"* (26y; M). This "learning benefit" was not reported by interviewees in the distribution stage. Additionally, even though several authors discuss the risk reduction abilities of co-producing (e.g., Etgar, 2008; Lusch et al., 2007), respondents perceived a "decrease of (privacy) risk" only in the manufacturing stage. Here, five out of 20 interviewees found it advantageous that, when self-assembling, no strangers (i.e., workmen) had to enter their home. Finally, two efficiency benefits only surfaced in the distribution stage. In this stage "time savings" form a main reason to co-produce and are brought forward by most respondents. Further, the "absence of personal contact" can drive customers to co-produce, as evidenced by the following quote: *"[Y]ou also get the possibility to upgrade here, but if a person asks you, I find it more annoying. Because it's like they want to pressure you"* (43y; M). Yet, not many interviewees stated this as a benefit.

Second, both excellence benefits described in the literature are observed in our interviews. However, "improved quality" was only distinguished in the manufacturing stage by a small number of interviewees. They told us: *"What you do yourself, you do better"* (31y; M). In contrast, we identified instances of "increased customization" in all stages, although large differences in relevance seem to exist between stages. In the distribution stage, only one respondent reported this benefit and there were several respondents in the manufacturing

stage but, in the design stage, almost every respondent indicated the opportunity to customize the offering as a salient advantage of co-production. As one interviewee expressed: *"Because then you can just really choose according to your preference and interest"* (24y; M).

Third, in the design and manufacturing stage, social benefits appear to exert some influence on customers' choice to co-produce. In both stages, although reported by a minority of respondents, several different social benefits were uncovered. Co-production was expected to increase social status and self-esteem, give a sense of accomplishment or make customers' feel proud of themselves. A female respondent verbalized it as follows: *"Yeah, I think you feel better ... So that you prove to yourself: Look, I can assemble a wardrobe"* (24y; F). Or as communicated by a male respondent about the planning of a trip: *"And then you think like: Yeah, look what I have accomplished and I have organized all that myself"* (27y; M). Notwithstanding, only one social element is discovered in the distribution stage. One interviewee expected a feeling of pride from engaging in co-production.

Finally, unlike in the distribution and manufacturing stage where play benefits were rarely observed, a majority of respondents in the design stage found co-production inherently attractive. It can give them a feeling of freedom or adventure, or it can pose a positive challenge. Or as one respondent explained: *"It is just incredibly fun to search all that stuff on the Internet"* (25y; M). As an interesting side note, mainly respondents indicating to choose the co-production alternative referred to the intrinsic advantages of this option. Customers preferring the no co-production option did not mention any play benefits.

### **Co-production costs**

Customers in every stage expected certain costs to arise from engaging in co-production. All costs found in the literature were also reflected in the interviews. Further, we uncovered two new cost elements (i.e., reduced quality and lower customization) not discussed in previous studies. Turning to the individual costs, the qualitative study yielded the following results (see Table 7).

**Table 7:** Co-production costs across stages

LITERATURE REVIEW	QUALITATIVE RESEARCH		
	Design stage	Manufacturing stage	Distribution stage
<b>Monetary costs</b>	Monetary costs	/	/
<b>Higher performance, financial, physical and/or privacy risk</b>	Performance risk	Performance risk	Performance risk
	/	Financial risk	Financial risk
	/	Physical risk	/
	/	/	Privacy risk
<b>No personal contact</b>	/	/	No personal contact
	Reduced quality	Reduced quality	Reduced quality
	/	/	Lower customization
<b>Time costs</b>	Time costs	Time costs	/
<b>Cognitive costs</b>	Cognitive costs	Cognitive costs	Cognitive costs
<b>Physical effort</b>	/	Physical effort	/
<b>Mental effort</b>	Mental effort	Mental effort	Mental effort
<b>Higher social and/or psychological risk</b>	/	/	Social risk
	/	/	Psychological risk

Four cost elements were observed in all three stages but not with equal importance: “performance risk”, “reduced quality”, “cognitive costs” and “mental effort”. “Performance risk” reflects that something may go wrong during co-production and, thus, the expected outcome is not attained. This risk factor was identified the most in the manufacturing and distribution stage but also fairly often in the design stage. Concerning “quality”, some customers believe that co-production improves quality (see benefit discussion), whereas others fear a reduction in quality from doing it themselves. As cited by a 58-year-old female respondent: “*They [i.e., professional mechanics] may do a better job*”. These quality concerns especially surfaced in the manufacturing and distribution stage. Further, “cognitive costs” such as stress, nervousness and anxiety can result as co-production enlarges customers’ responsibility by entrusting them with extra and potentially unfamiliar tasks. One woman expressed her feelings as follows: “*So, yeah, uncertain. Afraid you do something wrong*” (24y; F). This mostly came up in the distribution stage, yet several interviewees in the other stages of production also mentioned it. Interestingly, though cognitive costs reflect a significant source of negative value for customers in our interviews, this element received only scant attention in the literature. Finally, the shift of production tasks to customers requires significant “mental effort” as customers must make



decisions, search information and/or master new skills. Respondents mainly expected mental effort when participating in the design or distribution stage.

Our analysis further revealed several cost elements that are idiosyncratic to the different co-production stages. In the design and manufacturing stage, a majority of respondents cited "time costs" as a substantial barrier to co-produce. Further, in the distribution stage, several respondents indicated that they would miss the warmth of personal interaction, a disadvantage generally associated with SSTs. This was nicely illustrated by a 50-year-old female respondent: *"Yeah, the human contact is just missing...The warmth actually of people instead of those ice-cold machines"*. Also, according to several interviewees, the manufacturing of an offering can demand substantial "physical effort", and becoming involved in manufacturing or distribution can bring with it a "financial risk". One male interviewee phrased it as follows: *"If you break something, it's at your own expense"* (33y; M). Finally only very few respondents hinted at the following cost elements: "monetary cost" in the design stage, "physical risk" in the manufacturing stage and "privacy risk", "lower customization" and "sociopsychological risk" in the distribution stage. For instance, doing it yourself can create physical danger: *"You can hurt yourself by lifting something"* (27y; M). Or, since a machine (e.g., self check-in) cannot handle specific individual requests, lower customization opportunities exist. Further, customers struggling with the co-production task may experience a social pressure or loss of self-esteem, as evidenced by the following quote: *"You always have it when people are behind you, that you are more nervous"* (43y; M).

#### **2.4.5 Discussion**

Although exploratory in nature, we can draw some preliminary inferences from the qualitative data: 1) co-production benefits as well as costs are multidimensional in nature and both determine co-production value, 2) the various benefit and cost dimensions may differentially impact customers' co-production choice, and 3) depending on the production stage in which the customer participates, different benefit and cost dimensions might be important. For more definite conclusions, a quantitative investigation is required.

## **2.5 QUANTITATIVE STUDY**

Building on the literature and qualitative findings, this part of our research comprises a quantitative assessment of co-production value. In addition to validating the value elements discovered thus far, this phase addresses three other issues. First, in relation to the multidimensionality of co-production costs and the absence of an existing typology, we empirically derive a cost classification. Second, we assess the nomological validity of the co-production value construct by integrating it in a beliefs-attitude-intent framework (Fishbein & Ajzen, 1975). Third, we examine the differential impact of the various benefit and cost dimensions on customers' co-production intention across the distinct co-production stages.

### **2.5.1 Research setting and data collection**

Consistent with the qualitative study, we explored co-production value across three distinct co-production stages (i.e., design, manufacturing and distribution). These were again operationalized via the travel planning, wardrobe assembly and airport check-in setting. Upper-level undergraduate business students assisted with the data collection, following the procedure outlined by Bitner, Booms and Tetreault (1990). In total, 611 respondents participated in the survey. After removal of the respondents due to missing data, an effective sample size of 600 remained, which was distributed over the three stages as follows:  $n = 198$  for the design stage (46% women, 54% men; mean age  $M = 37.1$ , standard deviation of age  $SD = 15.7$ ),  $n = 202$  for the manufacturing stage (57.4% women, 42.6% men;  $M = 40.5$ ,  $SD = 14.6$ ) and  $n = 200$  for the distribution stage (50.5% women, 49.5% men;  $M = 38$ ,  $SD = 16.7$ ).

### **2.5.2 Questionnaire design**

To generate scale items for measuring co-production value, we built on the qualitative study results listed in Tables 6 and 7. Further, we measured co-production value in a relative sense by asking respondents to compare the co-production option with the no co-production option (e.g., "If I would choose the self check-in instead of the check-in at the desk, I would..."), since this is more compatible with a real-world choice task (Olsen, 2002; Ulaga & Eggert, 2006).

To measure each value element, we employed nine-point Likert scales. The customer evaluative judgments (i.e., attitude towards co-production and intention to co-produce) were measured using nine-point semantic differential scales adapted from Dabholkar and Bagozzi (2002). Furthermore, we included items from Dabholkar's (1996) realism scale and Bendapudi and Leone's (2003) believability scale to verify the realism of the scenario and options (i.e., co-production or no co-production) used. Each scenario was judged to be highly realistic. Table 8 offers a summary of the construct correlations for each co-production stage. An overview of all scale items is provided in Appendix C of this chapter.

**Table 8:** Construct correlations

<b>Design stage</b>	1	2	3	4	5	6	7	8	9
1. Attitude	1.00								
2. Economic Risk	-.62	1.00							
3. Efficiency	.44	-.39	1.00						
4. Excellence	.43	-.39	.51	1.00					
5. Intention	.83	-.63	.46	.51	1.00				
6. Personal Investment	-.53	.67	-.36	-.32	-.54	1.00			
7. Play	.76	-.63	.54	.43	.73	-.49	1.00		
8. Social Risk	-.48	.52	-.22	-.12	-.45	.30	-.39	1.00	
9. Social Benefits	.39	-.32	.25	.31	.40	-.15	.52	-.11	1.00
<b>Manufacturing stage</b>	1	2	3	4	5	6	7	8	9
1. Attitude	1.00								
2. Economic Risk	-.58	1.00							
3. Efficiency	.50	-.26	1.00						
4. Excellence	.60	-.48	.61	1.00					
5. Intention	.88	-.55	.50	.61	1.00				
6. Personal Investment	-.55	.51	-.32	-.41	-.51	1.00			
7. Play	.79	-.46	.51	.53	.71	-.46	1.00		
8. Social Risk	-.32	.42	-.10	-.21	-.30	.20	-.22	1.00	
9. Social Benefits	.52	-.33	.29	.38	.53	-.20	.47	-.23	1.00
<b>Distribution stage</b>	1	2	3	4	5	6	7	8	9
1. Attitude	1.00								
2. Economic Risk	-.66	1.00							
3. Efficiency	.58	-.43	1.00						
4. Excellence	.49	-.37	.51	1.00					
5. Intention	.76	-.60	.64	.44	1.00				
6. Personal Investment	-.65	.68	-.43	-.36	-.61	1.00			
7. Play	.73	-.60	.55	.48	.71	-.59	1.00		
8. Social Risk	-.26	.35	-.14	-.14	-.23	.28	-.25	1.00	
9. Social Benefits	.22	-.12	.20	.14	.26	-.05	.28	.03	1.00

### **2.5.3 Empirical derivation of a cost classification**

Existing literature does not offer an integrative framework to structure the various co-production costs (Papista & Krystallis, 2013). However, co-production research (e.g., Etgar, 2008) as well as our qualitative study suggest that different cost dimensions do exist. Therefore, we conducted a series of principal component analyses (PCA) to empirically derive the dimensionality of co-production costs. Inspection of Bartlett's test of sphericity (all  $p < 0.001$ ) and the Kaiser-Meyer-Olkin criterion (all  $> 0.75$ ) revealed that, for all three stages, the degree of inter-item correlation is sufficient to conduct a PCA. Based on the latent root criterion (i.e., eigenvalue  $> 1$ ), a solution with three components yielded the best results for each stage. The solutions are presented in Table 9 below.

The first component, observed in all three stages, is related to the social (e.g., status and social esteem) and psychological (e.g., pride, self-esteem and self-confidence) risks a customer opting for co-production may incur. Hence, this component is labelled "social risk". Another relevant component that is particularly clear in the manufacturing and design stage involves the increased time, effort and cognitive costs customers associate with co-production. A common theme among the cost items defining this component is that they are more personal or self-oriented. As such, this component is named "personal investments", following Smith and Colgate (2007).

**Table 9:** PCA of co-production costs (Rotated VARIMAX solutions)

Design stage				Manufacturing stage				Distribution stage			
	PC1	PC2	PC3		PC1	PC2	PC3		PC1	PC2	PC3
Pride	.90			Pride	.91			Pride	.95		
Self-esteem	.90			Self-esteem	.90			Self-esteem	.94		
Status	.90			Status	.81			Status	.95		
Self-confidence	.84			Self-confidence	.85			Self-confidence	.89		
Social esteem	.73			Social esteem	.78			Social esteem	.82		
<i>Cognitive costs 1</i>		.56		<i>Cognitive costs 1</i>		.77		<i>Cognitive costs 1</i>		.56	
<i>Cognitive costs 2</i>		.39		<i>Cognitive costs 2</i>		.78		<i>Cognitive costs 2</i>		.66	
<i>Time costs</i>		.62		<i>Time costs</i>		.68		<i>Time costs</i>		.39	
<i>Mental effort</i>		.78		<i>Mental effort</i>		.80		<i>Mental effort</i>		.57	
<i>Physical effort</i>		.65		<i>Physical effort</i>		.79		Privacy risk		.75	
Performance risk 1			.83	Performance risk 1			.88	Performance risk 1		.86	
Performance risk 2			.81	Performance risk 2			.79	Performance risk 2		.71	
Monetary costs			.52	Financial risk			.65	Financial risk		.81	
Reduced quality 1			.37	Reduced quality			.36	Reduced quality 1			.71
Reduced quality 2			.68	Physical risk			.67	Reduced quality 2			.79
				No personal contact			.34	No personal contact			.81
								Lower customization			.41
Eigenvalue	6.03	1.35	2.51	Eigenvalue	5.47	3.13	1.40	Eigenvalue	6.74	3.17	1.38
Variance explained (I)	40.02	8.97	16.76	Variance explained (I)	34.20	19.58	8.73	Variance explained (I)	39.65	18.66	8.13
Variance explained(R)	28.86	13.93	22.96	Variance explained (R)	25.30	21.70	15.51	Variance explained (R)	26.29	23.12	17.03

Variance explained (I) = the amount of variance explained by the principal components prior to rotation. Variance explained (R) = the amount of variance explained by the principal components after rotation.

*Note:* To enhance interpretability, common variable labels are used and the order of variables is kept constant. As a result, the eigenvalue and amount of variance extracted are not always listed in a descending order.

The third and final component typically includes items related to the co-production outcome and coincides to a large extent to what Etgar (2008) refers to as economic costs. As a result, this component is referred to as “economic risk”. While in the design and manufacturing stage performance and financial risk fall under the heading “economic risk”, in the distribution stage, these items are included in the “personal investment” dimension. Nonetheless, as this is an exploratory analysis, and to preserve comparability across stages, we decided to classify these items (i.e., performance, privacy and financial risk) under “economic risk” for our further analyses. In the subsequent partial least squares analysis, we check if this classification is warranted. The resulting cost classification is displayed in Table 10.

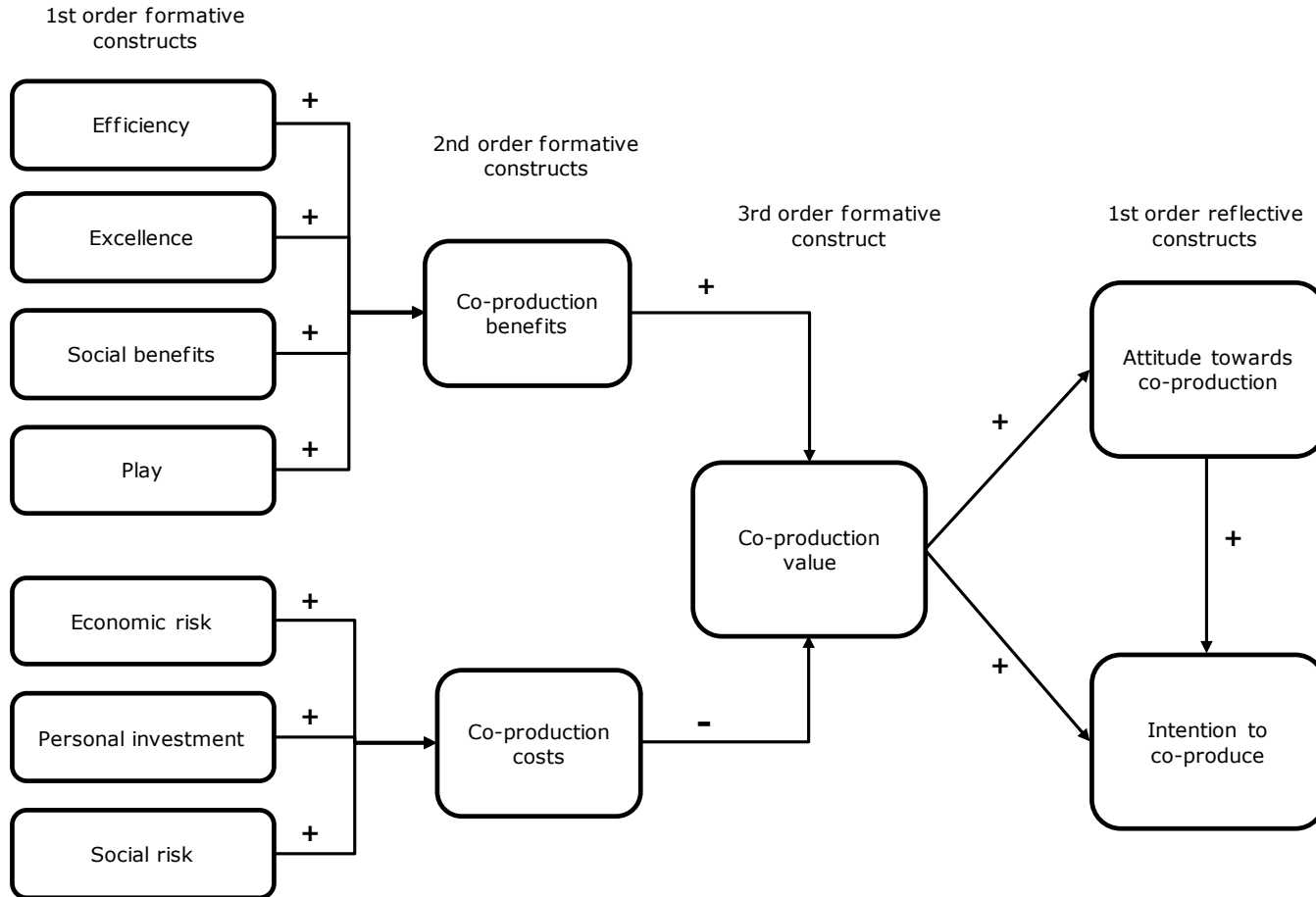
**Table 10:** Co-production costs classification

<b><i>SOCIAL RISK</i></b>
Higher social risk Higher psychological risk
<b><i>PERSONAL INVESTMENT</i></b>
Cognitive costs Time costs Mental effort Physical effort
<b><i>ECONOMIC RISK</i></b>
Monetary costs Higher performance, financial, physical and/or privacy risk Reduced quality Lower customization No personal contact

#### **2.5.4 Co-production value conceptualization**

The results of our research so far lead to the value conceptualization presented below in Figure 8. As aesthetic and altruistic benefits did not surface in our exploratory qualitative study and are only scantily cited in the literature, they are not included as part of co-production value. In the remainder of this paper we quantitatively validate this conceptualization as well as assess the relative importance of the different value drivers across co-production stages (i.e., design, manufacturing and distribution).

**Figure 8:** Co-production value conceptualization



### **2.5.5 Analytical approach**

We estimated the relationships put forward in our conceptual model by using a partial least squares approach to structural equation modelling (PLS-SEM) and, in particular, the SmartPLS 3 software package (Ringle, Wende, & Becker, 2015). The following reasons motivate this decision (Hair, Hult, Ringle, & Sarstedt, 2014; Hair, Sarstedt, Ringle, & Mena, 2012). First, next to reflective constructs, the PLS-SEM estimation procedure can easily accommodate the formative indicators that are present in our conceptualization. Second, our exploratory research objectives (i.e., developing a co-production value conceptualization and examining the relative impact of the co-production value dimensions) fit the PLS-SEM methodology extremely well. Third, we examine key drivers of customers' intention to co-produce.

Consistent with existing work (Ruiz et al., 2008; Ulaga & Eggert, 2006), we modelled co-production value as a higher-order construct. First, value forms the result of a trade-off between benefits and costs (e.g., Woodruff, 1997; Zeithaml, 1988). Second, as indicated by literature (e.g., Etgar, 2008; Ulaga and Eggert, 2006) and evidenced in our previous analyses, both the benefit and cost dimension consist of multiple components. As a result, we specified "Co-production value" as a third-order construct, composed of the second-order latent variables "Co-production benefits" and "Co-production costs". Building on the qualitative study results, the co-production benefits construct, in turn, was formed by the first-order dimensions of "Efficiency", "Excellence", "Social benefits" and "Play". Further, based on the principal components analysis, "Economic risk", "Personal investment" and "Social risk" represented the first-order co-production cost dimensions. Following the guidelines of Jarvis, Mackenzie and Podsakoff (2003), co-production value was conceptualized as formative at all three levels. The key customer evaluative judgments "Attitude towards co-production" and "Intention to co-produce" were modelled as first-order reflective constructs.

To model co-production value as a third-order construct, we used the two-stage estimation approach (Reinartz, Krafft, & Hoyer, 2004). For data analysis purposes, the default PLS algorithm settings (i.e., Path Weighting Scheme, 300



iterations and stop criterion is  $1 \times 10^{-7}$ ) were employed (Hair et al., 2014). To evaluate the statistical significance of the parameter estimates, we constructed percentile bootstrap confidence intervals based on 5000 samples (Hair, Ringle, & Sarstedt, 2011; Preacher & Hayes, 2008).

### **2.5.6 Measurement model evaluation**

The examination of the measurement model was conducted following the procedure proposed by Leroi-Werelds et al. (2014) and Hair et al. (2014).

**Reflective constructs** To determine the quality of the reflective constructs in our model (i.e., attitude towards co-production and intention to co-produce), we respectively examined unidimensionality, internal consistency reliability (composite reliability  $\rho_c$ ), indicator reliability (magnitude and statistical significance of construct indicators), convergent validity (average variance extracted AVE) and discriminant validity (HTMT<sub>90</sub> criterion of Henseler, Ringle and Sarstedt (2015)).

**Formative constructs** Relevant evaluation criteria for formative indices include multicollinearity ( $VIF < 5$ ), indicator reliability (statistical significance of construct indicators) and discriminant validity. In assessing indicator reliability, multicollinearity may create problems. From a statistical perspective, the deletion of highly correlated indicators is a feasible solution, yet in terms of content validity, it bears the risk of omitting a relevant part of the construct's domain (Diamantopoulos & Sigauw, 2006). Therefore, in addition to excluding indicators based on conceptual grounds, we tested whether indicator deletion has a significant effect on the amount of variance explained in a related target construct. Based on this procedure, several items were deleted from further analysis (see Appendix C). After treatment of multicollinearity, a few items of the social benefits construct were non-significant. However, since discarding insignificant formative indicators can substantially change the construct's domain and hardly impacts parameter estimates, we decided to retain these indicators for further analyses (Diamantopoulos & Winklhofer, 2001; Hair et al., 2011; Henseler, Ringle, & Sinkovics, 2009). Moreover, discriminant validity was substantiated as an absolute value of 1 does not fall within two

standard errors of the latent variable correlations, since, by nature, formative constructs may not be perfectly correlated with another model construct (Mackenzie, Podsakoff, & Jarvis, 2005).

Overall, as evidenced by the results presented in Appendix C, the reflective and formative scales demonstrated good psychometric properties in each co-production stage.

### **2.5.7 Structural model evaluation**

Our value conceptualization is supported by the data as evidenced by its predictive validity in terms of attitude and intention (see Table 11). The bootstrapped coefficient of determination ( $R^2$ ) is significantly larger than zero for both outcome variables in each co-production stage. Moreover, the nomological validity of the co-production value construct is evidenced by its significant relationship with customer attitude and intention to co-produce (see Path coefficients Table 11).

In addition, Table 11 shows that for all three stages the parameter estimates in our co-production value conceptualization are statistically significant and in the expected direction. The empirical results verified that customers weigh both the benefits and costs of co-production to form a value expectation. More specifically, all benefit (i.e., efficiency, excellence, social benefits and play) and cost (i.e., economic risk, personal investment and social risk) dimensions in our model play a significant role in customers' decision to engage in co-production. Furthermore, imposing and testing a linear constraint, hypothesizing an equal effect of the (combined) benefit and (combined) cost dimensions (i.e.,  $H_0 : |\beta_{benefits}| = |\beta_{costs}|$ ) indicated that, at the overall level, benefits exert a significantly larger influence on customers' co-production decision than costs in each stage (based on a 95% percentile bootstrap CI of the path coefficients).

**Table 11:** Quantitative model results

		Design stage		Manufacturing stage		Distribution stage	
<b>Predictive validity</b>							
		R <sup>2</sup>	95% CI	R <sup>2</sup>	95% CI	R <sup>2</sup>	95% CI <sup>a</sup>
	Attitude	.65	[.56;.73]	.73	[.66;.79]	.66	[.58;.74]
	Intention	.74	[.63;.83]	.78	[.69;.86]	.67	[.58;.76]
<b>Path coefficients</b>							
		$\beta$	95% CI	$\beta$	95% CI	$\beta$	95% CI
	Value - Attitude	.80	[.73;.86]	.86	[.81;.89]	.81	[.76;.86]
	Value - Intention	.38	[.21;.53]	.21	[.04;.38]	.52	[.38;.66]
	Attitude - Intention	.53	[.36;.68]	.70	[.52;.87]	.34	[.19;.49]
<b>Singular effects</b>							
		$\beta$	95% CI	$\beta$	95% CI	$\beta$	95% CI
2 <sup>nd</sup> order constructs	Benefits	.96	[.91;.98]	.97	[.94;.99]	.95	[.92;.98]
	Costs	-.84	[-.90;-.74]	-.77	[-.84;-.67]	-.85	[-.90;-.78]
1 <sup>st</sup> order benefit types	Efficiency	.59	[.41;.73]	.62	[.49;.74]	.80	[.69;.87]
	Excellence	.61	[.44;.75]	.75	[.66;.83]	.60	[.45;.72]
	Play	.98	[.94;.99]	.93	[.88;.97]	.94	[.89;.97]
	Social benefits	.52	[.34;.67]	.66	[.53;.76]	.31	[.14;.47]
1 <sup>st</sup> order cost types	Economic risk	.94	[.87;.98]	.89	[.77;.96]	.92	[.84;.96]
	Personal investment	.79	[.69;.88]	.83	[.69;.93]	.91	[.83;.97]
	Social risk	.70	[.55;.81]	.49	[.29;.66]	.36	[.17;.52]
<b>Total effect on co-production value</b>							
		$\beta$	95% CI	$\beta$	95% CI	$\beta$	95% CI
1 <sup>st</sup> order benefit types	Efficiency	.56	[.39;.69]	.60	[.47;.72]	.76	[.66;.84]
	Excellence	.59	[.42;.72]	.73	[.64;.80]	.58	[.44;.69]
	Play	.93	[.90;.95]	.91	[.85;.94]	.90	[.85;.93]
	Social benefits	.49	[.32;.64]	.63	[.51;.73]	.30	[.13;.45]
1 <sup>st</sup> order cost types	Economic risk	-.79	[-.82;-.73]	-.68	[-.73;-.59]	-.78	[-.82;-.71]
	Personal investment	-.66	[-.74;-.57]	-.64	[-.71;-.52]	-.78	[-.82;-.71]
	Social risk	-.58	[-.68;-.46]	-.37	[-.50;-.22]	-.30	[-.45;-.15]

<sup>a</sup> 95% percentile bootstrap confidence intervals based on 5000 bootstrap samples

Moreover, we calculated the total effects to understand the individual impact of the first-order benefit and cost dimensions on co-production value. To draw statistically valid conclusions about differences in relative importance, we performed pairwise comparisons between the various value dimensions (i.e., imposing linear constraints hypothesizing  $|\beta_i| = |\beta_j| (i \neq j)$ ) based on a

95% percentile bootstrap CI. The results of this analysis are presented in Table 12.

**Table 12:** Relative importance of value dimensions across stages

<b>Rank</b>	<b>Design stage</b>	<b>Manufacturing stage</b>	<b>Distribution stage</b>
<b>1</b>	Play	Play	Play
<b>2</b>	Economic risk	Economic risk, Efficiency, Excellence, Personal investment, Social benefits	Economic risk, Efficiency, Personal investment
<b>3</b>	Efficiency, Excellence, Personal investment, Social benefits, Social risk		Excellence
<b>4</b>		Social risk	Social benefits, Social risk

First, in the design stage, “play” affects customers’ co-production decision the most, followed by concerns of “economic risk”. Hereafter, the impact of the remaining value dimensions (i.e., efficiency, excellence, social value, personal investment and social risk) does not differ significantly. Second, in the manufacturing stage, “play” also exerts the largest influence on customers’ propensity to participate, and, again, “economic risk” comes next. Even so, the impact of “economic risk” equals that of “excellence”, “efficiency”, “personal investment” and “social benefits” in predicting co-production intention. “Social risk” contributes the least to customers’ choice. Third, in the distribution stage, “play” once again occupies the first place and “economic risk” holds the second rank. However, the impact of the dimensions “personal investment” and “efficiency” equals the influence of “economic risk”, while “excellence” has a significantly smaller effect on co-production evaluations. Lastly, the value impact of “social benefits” and “social risk” is the lowest.

### **2.5.8 Discussion**

From the quantitative examination of the co-production value conceptualization, several relevant points emerged: 1) co-production costs entail the dimensions economic risk, personal investment and social risk, 2) together with the benefit dimensions efficiency, excellence, social benefits and play, these cost

dimensions constitute co-production value, 3) the value customers expect to create significantly affects their attitude towards and their intention to co-produce, and 4) though the value dimensions differentially impact customer evaluations, a cross-stage (i.e., design, distribution and manufacturing) comparison uncovered a remarkably stable rank order of cost and benefit dimensions.

First, in each stage, play, an intrinsic benefit dimension, exhibited the greatest effect on customers' co-production intentions. Second, cost dimensions (i.e., economic risk and/or personal investment) consistently ranked second in influencing customers' decision to co-produce. Third, efficiency and excellence benefits exerted only a moderate influence on co-production intentions. Finally, social benefits and social risk displayed a limited impact on customers' propensity to co-produce.

## **2.6 CONCLUSION AND IMPLICATIONS**

Despite its fundamental role in encouraging customers to co-produce, a comprehensive and empirically grounded conceptualization of co-production value was essentially lacking. Therefore, this chapter aimed to provide an integrative understanding of the co-production value construct from the perspective of the customer. Specifically, we examined both benefits and costs and determined their differential impact on customers' intent to co-produce across co-production stages (i.e., design, manufacturing and distribution).

To this end, we identified potential co-production benefits and costs through an extensive literature review. Next, an exploratory qualitative investigation further helped to develop a co-production value conceptualization and provided preliminary insight into the relevance of value elements. Finally, we validated our conceptualization using a large-scale quantitative study. As such, this chapter enriches co-production literature and practice by integrating the scattered co-production value research into a single, comprehensive and theoretically grounded conceptualization. With this knowledge, firms can design and promote their co-production initiatives as to substantially enhance customer

attraction and, ultimately, the firm's financial performance (Gupta & Zeithaml, 2006).

### **2.6.1 Theoretical implications**

The findings contribute to extant literature in the following ways. First, they extend previous research by qualitatively and quantitatively supporting the - so far untested - premise that both benefits and costs play an essential role in customers' decision to co-produce. The results endorse Etgar 's (2008) idea and indicate how customers only co-produce when the trade-off between positive and negative co-production value elements is favourable, and more advantageous than the full-service option. Further, contrary to the "losses loom larger than gains" notion of prospect theory (Kahneman & Tversky, 1979), our study demonstrates that, in forming customer evaluations, the benefits expected from co-producing are more influential than the anticipated costs.

Second, the results enhance knowledge on customer co-production value by qualitatively and quantitatively unravelling the full dimensionality of both co-production benefits and costs. So far, co-production studies evaluated individual value motives or a limited number of benefit dimensions (e.g., Curran and Meuter, 2007; Dabholkar and Bagozzi, 2002; Dabholkar, 1996), necessitating a more thorough investigation of what creates value in co-production. Departing from Holbrook's (1999) typology, this study identified four salient benefit dimensions: efficiency (e.g., monetary benefits and higher perceived control), excellence (e.g., increased customization), social benefits (e.g., pride) and play (e.g., enjoyment). On the other hand, Holbrook's altruism and aesthetic dimensions do not appear relevant in co-production. Further, as no cost classification was available in the literature, we empirically derived one. According to the results, co-production costs comprise three dimensions: economic risk (e.g., reduced quality), personal investment (e.g., time and cognitive costs), and social risk (e.g., reduced self-esteem and social esteem). Though these same overarching value dimensions emerge in each co-production stage (i.e., design, manufacturing and distribution), their contents are not entirely equal. This coincides with Holbrook's (1999) definition of customer value as a context-specific evaluation.

Third, our research furthers academic insight in the relevance of the different benefit and cost dimensions for customer attraction in three co-production stages. As prior research is conceptual in nature, only explored a subset of value dimensions or focused on a single co-production stage, it was unable to provide an accurate picture of the dimensions' relative importance. Interestingly, our study revealed a remarkably consistent pattern in the rank order of value dimensions across co-production stages, despite the different nature of these stages (Atakan et al., 2014).

Regardless of the stage, the influence of intrinsic benefits on customer intentions surpasses the impact of extrinsic benefits. Since extant literature predominantly concentrated on extrinsic co-production motives, this finding advances theoretical insight by establishing intrinsic play benefits as key differentiators for attracting customers in co-production. Hence, in line with experiential consumption (Arnould & Thompson, 2005; Holbrook & Hirschman, 1982), the hedonic pursuit of pleasure in consumption experiences extends to co-production settings. Further, considering these extrinsic benefits are extensively cited in the literature and our customer interviews, efficiency and excellence's moderate influence on customer intentions is surprising and suggests that they are hygiene factors (Agustin & Singh, 2005). Failure to provide a certain base level deters customers, whereas increasing efficiency and excellence beyond this threshold does not greatly enhance customer attraction. Put otherwise, for customers to co-produce, these benefits must be present; however, their presence is not enough.

Further, considering the prevalence of cost dimensions, a number of customers, despite recognizing the benefits of co-production, will not co-produce because they find it too effortful or they fear that something will go wrong. This fits Cenfetelli and Schwarz's (2011) finding that inhibitors and enablers may independently determine behavioural intent. As prior empirical studies only covered co-production benefits (e.g., Chan et al., 2010; Dong et al., 2008; Yim et al., 2012), this reveals a serious gap in existing literature and offers first evidence of the critical role of co-production costs. Finally, co-production's ability to create social benefits but also result in social costs, is congruent with the

notion that the adoption of new (technological) consumption formats is often characterized by paradoxes (Johnson, Bardhi, & Dunn, 2008). Customers can simultaneously form conflicting, advantageous and disadvantageous social expectations that separately influence their evaluative judgments.

### **2.6.2 Managerial implications**

Considering the ongoing proliferation of co-production, co-production initiatives must not only compete for customers with full-service alternatives but, also, other co-production options. Our findings provide several actionable, value-based suggestions for co-production differentiation in order to optimize customer attraction and become viable.

***Consider both benefits and costs*** Co-production involves benefits as well as costs for the customer, and firms should take both aspects into account when designing new co-production options or evaluating existing ones. Managers who want to successfully involve customers in co-production should explore both the positive and negative facets of their co-production options and regularly assess the point beyond which the costs of co-production outweigh the benefits. Furthermore, they should take into account the relative impact of the different costs and benefits on customers' intention to co-produce in order to effectively and efficiently allocate firm resources.

***Enhance intrinsic co-production benefits*** Although extant literature predominantly concentrates on extrinsic motives and, according to our results, extrinsic benefits (i.e., efficiency, excellence and social benefits) indeed exhibit a significant impact on co-production intention, solely relying on them is unlikely to convince customers to opt for the firm's co-production option. Firms can differentiate their co-production initiatives by facilitating intrinsic play benefits, as these form the most influential predictors of customers' choice, independent of the production stage. Without the usual incentives of time savings and increased control, co-production can still be attractive to customers by providing an enjoyable, exciting and challenging experience. This can be achieved by providing customers training or coaching on their new co-production role (Yim et al., 2012). Additionally, a conducive servicescape (e.g., lay-out, atmosphere)



can lead to enhanced feelings of pleasure (Collier & Barnes, 2015). In summary, firms should think of ways to infuse some fun into their co-production activities. For instance, with new, interactive Pepsi vending machines, customers can win a drink by playing a game.

***Reduce co-production costs*** As customers face various costs when co-producing, firms should not merely focus on raising co-production benefits but, also, pay adequate attention to lowering the costs of co-production. The prominence of cost concerns urges managers to allocate considerable resources to the reduction of these co-production costs. Especially influential are economic risk and personal investment, reflecting customers' time and effort expenditures and their anxiety that something could go wrong. Firms could anticipate on this by providing detailed, step-by-step instructions that help customers accomplish the task successfully and with minimal effort. Furthermore, firms could set up a help-desk where customers can turn to when encountering problems during co-production.

Practically, firms have to differentiate their co-production initiatives through value-based (re)design and via attractive value propositions (Jia et al., 2012). First, they must actually design new co-production activities or redesign existing ones as to facilitate higher customer value. Second, they should proactively shape customers' value expectations via enticing value propositions that promote the value customers can create by choosing the firm's co-production option (Ballantyne, Frow, Varey, & Payne, 2011). Carefully developed communication strategies can effectively change customers' perceptions of a co-production experience (Haumann et al., 2015).

## **2.7 DIRECTIONS FOR FURTHER RESEARCH**

Although this study advances our insight in the value of co-production from the customer's perspective, several exciting directions for further research remain open.

First, it would be interesting to investigate real-life co-production settings and actual customer behaviour in the future. Nevertheless, the use of scenarios is supported as the interview respondents empathized rather effortlessly with the situations and given the overall high ratings on the realism checks in the quantitative study. Related, behavioural intention measures are very strong indicators of customer behaviour (Bell, Auh, & Smalley, 2005; Seiders, Voss, Grewal, & Godfrey, 2005).

Additionally, the developed conceptualization could be examined in a longitudinal study to test whether and how customers' perceptions of co-production value change over time. As customers become more familiar and experienced with a particular co-production initiative, their evaluations of the related benefits and costs might alter.

Further, not all customers necessarily value the same elements when deciding to co-produce or not. Since customers' distinct personal characteristics can affect their perceptions and evaluation processes, these individual traits could alter the relative impact of the different value dimensions (Dabholkar & Bagozzi, 2002; Yi & Gong, 2008). By examining the moderating influence of malleable customer characteristics (e.g., self-efficacy), researchers could offer managers more detailed advice on how to target a particular customer segment with a specifically adapted value proposition.

Another route for further research could be directed towards the antecedents of the different value dimensions. Since play is so important in customers' co-production decision, a deeper investigation into what exactly makes a co-production activity intrinsically attractive is an interesting future direction to explore. For instance, for technology-mediated environments, like the self check-in, Childers, Carr, Peck and Carson (2001) suggest that including images, video, colour, humour or music can create a more enjoyable experience.

Finally, complementary to our study, it could be intriguing to look at co-production value from the employee side. Employees can play a big role in the success of a co-production initiative by, for example, encouraging customers to

use the co-production option, providing positive recommendations and/or demonstrating how to use it. However, if employees perceive negative value for themselves, they will be less likely to exhibit these positive behaviours. If there is low (or negative) value, employees might even sink the implementation.

Summarized, our findings offer an important starting point to researchers and practitioners who embrace the idea that co-production forms a key source of competitive success.

## 2.8 APPENDICES

### 2.8.1 Appendix A: Co-production benefit and cost explanations

**Table A:** Conceptual explanation of co-production benefits

<b>Co-production benefits</b>	<b>Explanation</b>
<b><i>Efficiency</i></b>	
Monetary benefits	A lower purchase price or more value for money (Etgar, 2008).
Time savings	Gaining time (Bateson, 1985).
Higher perceived control	Being able to specify the service process and outcome (Lee & Allaway, 2002).
Learning benefit	Knowledge gains that allow you to work more efficiently in the future (Nambisan & Baron, 2009).
No personal contact	Purposive avoidance of human contact (Curran et al., 2003).
Reduced risk	Lower potential of performance problems, financial or privacy loss, physical or sociopsychological harm (Etgar, 2008).
<b><i>Excellence</i></b>	
Improved quality	Higher overall excellence of the offering (Dagger, Sweeney, & Johnson, 2007).
Increased customization	Enhanced adaptation of the offering to customers' personal wishes and preferences (Etgar, 2008).
<b><i>Social benefits</i></b>	
Social esteem/status	Social recognition gained from succeeding in an activity (Peters et al., 2012).
Self-esteem	Contentment with your own identity and capabilities (Longman, 2003).
Self-confidence	The belief that you can do things well and people like you (Longman, 2003).
Sense of accomplishment	Personal feeling of gratification from completing a project (Longman, 2003).
Pride	The belief that you respect yourself and deserve respect from others (Longman, 2003).
Self-fulfilment	Feeling content because you realize your own potential and use all your skills and abilities (Longman, 2003).
Self-expression	Being able to reveal your true identity to others (Etgar, 2008; Xie et al., 2008).
Uniqueness value	Impress others and stand out via an unique experience or physical outcome (Merle, Chandon, Roux, & Alizon, 2010; Schreier, 2006).

**Table A:** Conceptual explanation of co-production benefits (Continued)

<b>Play</b>	
Fun/Enjoyment	Intrinsically enjoying an experience (Yim et al., 2012).
Freedom/Independence	Intrinsic satisfaction from the ability to make your own decisions (Longman, 2003).
Adventure/Excitement	Joy of exploring a novel and enthralling activity (To et al., 2007).
Personal challenge	Intrinsic delight from tackling a difficult assignment and doing better than before (Peters et al., 2012).
Intellectual stimulation	Joy from learning new skills (Peters et al., 2012).
Deviation from routine	Pleasure from variation, as a welcome change from daily tasks (Etgar, 2008).
<b>Aesthetics</b>	
Aesthetics	The self-oriented appreciation of an experience as a source of beauty (Etgar, 2008).
<b>Altruistic benefits</b>	
Ethics and spirituality	Engaging in an activity for the beneficial influences on others, as an end in itself (Etgar, 2008).

**Table B:** Conceptual explanation of co-production costs

<b>Co-production costs</b>	<b>Explanation</b>
Monetary costs	A higher purchase price or less value for money.
Performance risk	The possibility that the offering does not perform as expected and, thus, not delivers the promised benefits (Crespo et al., 2009; Etgar, 2008; Papista & Krystallis, 2013).
Financial risk	The risk of financial losses due to required service recovery (e.g., when a customer messes up a self-assembly and the repair involves extra costs) (Etgar, 2008).
Physical risk	The danger of bodily harm (Etgar, 2008).
Privacy risk	Potential loss of control over personal information (Crespo et al., 2009).
No personal contact	Loss of the opportunity to deal with real people (Curran et al., 2003).
Time costs	Required amount of customers' time (Campbell et al., 2011).
Cognitive costs	Anxiety and stress related to the risks and uncertainties of an activity (Campbell et al., 2011; Etgar, 2008).
Physical effort	Manual labour required for service completion (Etgar, 2008).
Mental effort	Intellectual exertion to make decisions, learn new skills, ... (Etgar, 2008).
Sociopsychological risk	Risk of harm to the customer's self-esteem or how he/she is perceived by others (Crespo et al., 2009; Etgar, 2008).

## 2.8.2 Appendix B: Research scenarios

### **DESIGN STAGE: Road trip to the USA**

Imagine, you have participated in the annual lottery of travel agency OptiTravel. And, incredibly, you have won the grand prize: a travel voucher of € 4,000 for a 14-day trip to the West Coast of the United States. More specifically, you have won a voucher for a round trip by car for two (you and a companion of your choice). So you cannot use the travel voucher for a group tour.

The brochure of OptiTravel praises the West Coast as an excellent region for travelling by car. In addition, the brochure advises the West Coast because of its wide range of attractions. There are the big cities: cosy San Francisco, spectacular Las Vegas, historic San Diego, sizzling Los Angeles, ...



In addition, the West Coast offers wonderful National Parks full of natural beauty, such as the vast Yosemite, the desolate Death Valley, the stunning Grand Canyon, the volcanic Yellowstone, the mysterious Bryce Canyon, ...



When you go to travel agency OptiTravel to gain more information about their trips, their employee tells you that you have two options for planning your trip.

#### **Option 1: A car trip planned by the agency**

Through the agency you can book a fully organized car tour. Four of their travel packages cost just € 4,000 for two people. So with your travel voucher you can choose between these four tours, each with their own emphasis.

Each travel package contains a fixed itinerary, a mapped out day program with excursions, hotel accommodations with breakfast, flights, travel insurance and a

rental car. Not included in the package are other meals, entrance fees, tips and personal expenses.

You can find detailed information on the various travel packages (detailed day program, hotels, ...) on the OptiTravel website. Below you already find a brief description.

### **Package 1: Grand City Tour**

Be amazed by the grandeur of famous American cities. Fly from Brussels to San Francisco (1 day) and visit the city (3 days). Then drive via Las Vegas (3 days) and San Diego (2 days) to Los Angeles (4 days). Eventually you fly back from LA to Brussels (1day).

### **Package 2: The Wonders of Nature**

This is the perfect tour for exploring the stunning natural beauty in the western USA. Fly from Brussels to San Francisco (1 day). Then drive via Yosemite (2 days) and Death Valley (1 day) to Zion (2 days) and Bryce Canyon (1 day). Visit Monument Valley (1 day) and Lake Powell (2 days) next and end in the Grand Canyon (3 days). Finally you fly from Las Vegas to Brussels (1day).

### **Package 3: Highlights of the West**

Enjoy during this tour both the vibrant cities and stunning landscapes the West Coast has to offer. Fly from Brussels to Los Angeles (1 day) and drive, after a visit to the city (2 days), along the coast to San Francisco (2 days). Next visit the National Parks Yosemite (2 days), Death Valley (1 day) and Grand Canyon (2 days). Off course a visit to famous gambling city Las Vegas (2 days) is also on the itinerary. Through Palm Springs (1 day) you finally drive back to LA and fly to Brussels (1 day).

### **Package 4: Golden California**

Visit during this car trip a few highlights of California. Fly from Brussels to San Francisco (1 day) and start your journey with a visit to this "City by the Bay" (3 days). Then drive along the famous coastal road "Highway 1" to Los Angeles (4 days) and make stops along the way in Monterey (1 day), San Simeon (1 day)

and Santa Barbara (1 day). Finally, explore San Diego (2 days). Afterwards you fly back from LA to Brussels (1 day).

If you book one of these packages, you also receive a travel guide, including, for every day, a description of your itinerary, information about the sights and planned excursions and an overview of the booked hotels. So, all you have to do is book a travel package and OptiTravel arranges the rest.

### **Option 2: Self designed car trip**

The travel agency also offers the opportunity to completely design your own trip, so you can determine what you want to visit (cities, national parks, ...) and how long you want to stay there. For this you can use your travel voucher of € 4,000.

To help you plan your custom trip, you can find a lot of information on the website of the travel agency:

- Brochures of the various National Parks on the West Coast
- Brochures of the big cities and their sights
- A list of possible excursions
- An overview of potential accommodations (hotels, motels, campgrounds, ...)
- Examples of itineraries of other customers
- Practical tips on travelling in the USA (travel documents, finance, culture, ...)
- Links to websites with useful information on the West Coast and the USA
- Links to websites of airlines and car rental companies



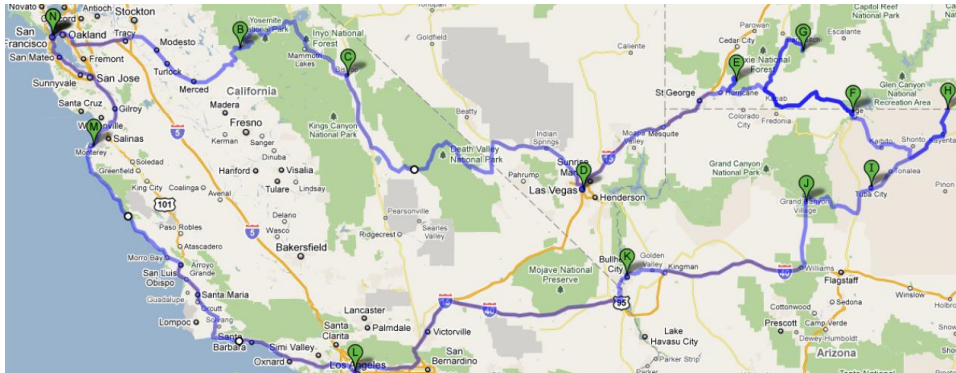
For all options you can also find an overview of the corresponding prices. Furthermore, you can look for additional information on the Internet.

Based on all this information, you then design your own itinerary and day schedule:

- Cities, National Parks, sights, ... you want to visit
- How long you want to stay everywhere
- Which excursions you want to join
- In which accommodations you want to stay overnight



## Example of an itinerary



Afterwards, you go with the self-designed itinerary to the travel agency. There, you go through your itinerary together with an experienced travel agent. He can help you adjust where necessary if something is not feasible.

When your itinerary is satisfactory, the travel agent books your chosen accommodation and excursions. Furthermore, a few weeks later you receive a travel guide from the travel agency (a daily description of your route, information about the sights, the hotels booked, ...). You can also arrange your flights, car hire and travel insurance via the travel agency.

## **MANUFACTURING STAGE: Wardrobe assembly**

Imagine, you want to buy a new wardrobe. More specifically, you are looking for a wardrobe with the following dimensions: 2m x 2m30 x 60cm. Consequently, you visit furniture store InterDesign and address a salesperson. After you inform him of your preferences, he takes you to the salesroom and shows you several wardrobes that fit your requirements. You discuss the different models with the salesperson and then select a particular wardrobe.

### **Selected wardrobe**



The salesperson subsequently writes down the wardrobe details and your personal information on an order form. Afterwards he informs you of the two options InterDesign offers to customers for installing and assembling their wardrobe:

### **Option 1: Installation by professional store personnel**

The first option entails the placing of the wardrobe by professional store installers at a charge. Within a month the installers come over to install your wardrobe. Afterwards you only have to put your clothes and other belongings in the wardrobe.

### **Option 2: DIY kit – Self-assembly of the wardrobe**

Or you can choose to assemble the entire wardrobe yourself. In this case, the various wardrobe components are delivered to your home within a month. At the

same time, you receive the design plan of the wardrobe and detailed assembly instructions. Then you can get started with the assembly. The required nails, screws, ... are included. You only need a hammer and an (electric) screwdriver.

After you have made your choice, the salesperson notes it on the order form and hands it to you. You can now go to the register and pay.





**Attention:**

- If you choose to assemble the wardrobe with help from others (family, friends or acquaintances), this is considered self-assembly.
- If you let others (family, friends or acquaintances) assemble the wardrobe completely, this is not considered self-assembly.

## ***DISTRIBUTION STAGE: Airport check-in***

Imagine, you booked a 14-day trip to Croatia for you and your partner. You booked the flights with Brussels Airlines. Last week you received the booking code and flight information via mail (date and time of the flights, flight numbers).

### **Flight information**

Vlucht	Van	naar	Datum			Duur	Klasse
 SN5501	Brussel (BRU) België	Zagreb (ZAG) Kroatië	ma 6/08	11:10	13:20	2h10	Economy
 SN5502	Zagreb (ZAG) Kroatië	Brussel (BRU) België	ma 20/08	08:10	10:30	2h20	Economy

Boekingscode: JSTEID

Today, it's time to depart. Your suitcases are packed and you are ready to leave. You have arranged transport and now you have arrived at the airport. You and your partner each have one large suitcase and piece of hand luggage, which comply with the size and weight rules. It is now time to check in.

You can choose one of two options to check in.

### **Option 1: Check-in at the desk**

You go to the check-in desk of Brussels Airlines. When it is your turn, the employee welcomes you and asks for your passport. After you hand over your passport, the employee retrieves your flight information and goes over the details with you. Next, he/she asks if you want to upgrade to a higher class at an extra charge (more legroom, more extensive menu choice, ...). If you decide to upgrade, the employee will ask for your credit card information.

Now the employee asks to put your luggage on the conveyor. He/she weighs your suitcases and prints out two labels for each piece of luggage. He/she attaches one label to your suitcase and the other to your boarding pass. Finally, the employee hands you your boarding pass and tells you at which gate your flight departs.



## **Option 2: Self check-in**



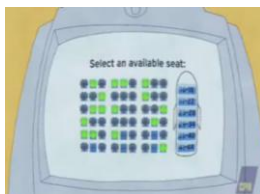
You take your luggage to a self check-in machine. When it's your turn, you check yourself in several steps in.

### **Step 1**



Select your airline by pressing the button with the name of your airline, namely Brussels Airlines. Next, select your language in the same way. Now identify yourself by entering your passport or your booking code. Your reservation and flight information appears on screen. Check these data carefully. Then confirm by pressing "OK".

### **Step 2**



A floor map of the plane appears on screen and you can select your desired seat. The seats that are still available are coloured green. Select a seat by pressing the desired place on the floor plan and, next, the "OK" button.

Furthermore, you have the option to upgrade to a higher class at an extra charge (more legroom, more extensive menu choice, ...). If you decide to upgrade, the machine will ask for your credit card information.

**Step 3**

Now check in your luggage. Select the number of suitcases to check in by pressing the "+" and "-" buttons and next the "OK" button. Put your suitcases on the scale. Since they are not too heavy, the machine automatically prints two labels for each piece of luggage. Attach one label to your suitcase and place it on the conveyor. Store the other label carefully until you have reached your destination and retrieved your luggage. Do this for all of your suitcases.

**Step 4**

The check-in is completed. The only thing you still have to do is to print your boarding pass. Press the button "Print boarding pass". The machine now prints it automatically. You can find the number of the gate where your flight departs on your boarding pass. You can now proceed to the security check.

### 2.8.3 Appendix C: Measurement model evaluation

Co-production value			
	Loadings		
	Design stage	Manufact. stage	Distr. stage
If I would choose the <u>self-planned roundtrip/DIY kit/self check-in</u> instead of the roundtrip planned by the travel agency/ assembly by professionals/check-in at the desk, ...			
<b>Efficiency</b>			
I would save money.	NA	.39***	NA <sup>a</sup>
this would offer me more value for my money.	.65***	NA	NA
I would save time.	NA	.31**	.70***
I would have more freedom to control my budget.	.45***	NA	NA
I would have more control over the check-in/ assembly/planning process.	.49***	.78***	.68***
I would gain knowledge that allows me to work more efficiently in the future.	.38**	.52***	NA
I would find the absence of personal contact with an employee agreeable.	NA	NA	.58***
this would offer me more convenience.	.89***	.76***	.92***
I would find it agreeable that no assemblers have to enter my home.	NA	.30**	NA
<b>Excellence</b>			
the service quality would be higher.	.63***	NA	.74***
the quality of the trip/finished wardrobe would be higher.	.99***	.92***	NA
I would have more opportunities to adapt the planning process/assembly/check-in to my personal wishes and preferences.	MC <sup>b</sup>	.51***	.85***
I would have more opportunities to adapt my trip/flight to my personal wishes and preferences.	.48***	NA	.82***
I would find it agreeable that I can assemble the wardrobe whenever I want.	NA	.70***	NA
I would have more freedom of choice.	NA	NA	.67***
<b>Social benefits</b>			
this could positively impact the opinion my family or friends have of me.	.66***	.57***	.39
this could positively affect my self-image.	.73***	.69***	MC <sup>b</sup>
this would provide me with feelings of accomplishment	.90***	.92***	.91**
this could positively affect my personal pride.	.74***	.75***	.49*
this could increase my status.	.44**	.35***	.27
this could increase my self-confidence.	.61***	.61***	.44*
this would offer me opportunities to further develop my personal skills.	.65***	.63***	NA
this would offer me opportunities for self-expression.	.66***	.41***	NA
this would offer me more opportunities to stand out.	.59***	.22	NA

<b>Play</b>			
I would find this more enjoyable.	.96***	.99***	.96***
this would give me a sense of freedom.	.75***	.77***	.79***
this would give me a sense of adventure.	.71***	.67***	.35***
this would be a positive challenge.	.74***	.77***	.45***
this would be a welcome change.	.74***	.74***	.73***
this would be pleasant, because it gives me the opportunity to learn something new.	.68***	.61***	.59***
<b>Economic risk</b>			
this would offer me less value for my money.	.43***	NA	NA
I would be more concerned that the trip isn't a success.	.88***	NA	NA
I would be more concerned that the trip isn't thought through.	.88***	NA	NA
I would be concerned that the DIY kit does not contain all necessary parts.	NA	.30**	NA
I would be concerned that the assembly instructions aren't clear.	NA	.58***	NA
I would be more concerned for technical failures.	NA	NA	.71***
I would be more concerned that I would miss my flight.	NA	NA	.68***
I would be concerned that damages I make to the wardrobe/missing my flight will cost me money.	NA	.52***	.61***
I would be concerned that I get injured.	NA	.51***	NA
I would be more concerned that my personal info (e.g., address and account info) is misused.	NA	NA	.53***
I would miss the personal contact with the professional assemblers/employee.	NA	.22*	.74***
I would mind that I can't ask questions.	NA	NA	.59***
the service quality would be lower.	.48***	NA	.78***
the quality of the trip/finished wardrobe would be lower.	.84***	.95***	NA
I would have less opportunities to adapt the check-in process to my personal wishes and preferences.	NA	NA	.58***
<b>Personal Investment</b>			
this would cost me more time.	.20*	.56***	.50***
this would cause me more stress.	.95***	.96***	.94***
I would be concerned that I make mistakes.	.85***	.92***	.82***
this would require a larger physical effort.	.51***	.52***	NA
this would require a larger mental effort.	.62***	.65***	.79***
<b>Social risk</b>			
this could negatively impact the opinion my family or friends have of me.	.79***	.82***	.91***
this could negatively affect my self-image.	.92***	.90***	MC
this could negatively affect my personal pride.	MC	MC	MC
this could lower my status.	.68***	.85***	MC
this could lower my self-confidence.	.82***	.84***	.89***

<sup>a</sup> NA = item not applicable to the setting at hand

<sup>b</sup> MC = item removed from analysis due to multicollinearity

\* $p < .10$ ; \*\* $p < .05$ ; \*\*\* $p < .01$



**Customer evaluative judgments**

<b>Attitude towards co-production</b>	<b>Loadings</b>		
	<b>Design stage</b>	<b>Manufact. stage</b>	<b>Distr. stage</b>
In general, how would you describe your feelings towards self-planning the roundtrip/the DIY kit/the self check-in?			
Bad – Good	.96***	.98***	.95***
Unpleasant – Pleasant	.96***	.98***	.96***
Negative – Positive	.97***	.98***	.96***
Unfavourable - Favourable	.96***	.98***	.95***
Design stage: $\lambda_1 = 3.71$ ; $\lambda_2 = .14$ ; $\rho_c = .98$ ; AVE = .93			
Manufacturing stage: $\lambda_1 = 3.83$ ; $\lambda_2 = .07$ ; $\rho_c = .99$ ; AVE = .96			
Distribution stage: $\lambda_1 = 3.66$ ; $\lambda_2 = .17$ ; $\rho_c = .98$ ; AVE = .91			
<b>Intention to co-produce</b>			
In the situation described, how likely is it that you would choose the self-planned roundtrip/DIY kit/self check-in?			
Very unlikely – Very likely	.97***	.98***	.96***
Impossible - Possible	.97***	.98***	.96***
Design stage: $\lambda_1 = 1.88$ ; $\lambda_2 = .12$ ; $\rho_c = .97$ ; AVE = .94			
Manufacturing stage: $\lambda_1 = 1.93$ ; $\lambda_2 = .07$ ; $\rho_c = .98$ ; AVE = .97			
Distribution stage: $\lambda_1 = 1.84$ ; $\lambda_2 = .16$ ; $\rho_c = .96$ ; AVE = .92			
$\rho_c$ = composite reliability * $p < .10$ ; ** $p < .05$ ; *** $p < .01$			

**Realism check**

	<b>Mean</b>		
	<b>Design stage</b>	<b>Manufact. stage</b>	<b>Distr. stage</b>
The situation described was realistic.	6.73***	7.45***	7.74***
I had no difficulty imagining myself in the situation.	7.02***	7.55***	7.80***
The situation described was believable.	6.70***	7.52***	7.85***
The options described were realistic.	6.99***	7.29***	7.55***
I had no difficulty imagining myself making the choice.	7.04***	7.47***	7.64***
The options described were believable.	7.03***	7.41***	7.69***

All scale items differed significantly from the midpoint  
\*  $p < .10$ ; \*\*  $p < .05$ ; \*\*\*  $p < .01$



**CHAPTER 3**

**DRIVING CO-PRODUCTION SATISFACTION AND CONTINUED USE: THE  
ROLE OF CUSTOMER, FIRM AND EMPLOYEE QUALITY CONTRIBUTIONS**

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## **CHAPTER 3**

### **DRIVING CO-PRODUCTION SATISFACTION AND CONTINUED USE: THE ROLE OF CUSTOMER, FIRM AND EMPLOYEE QUALITY CONTRIBUTIONS**

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#### **ABSTRACT**

Considering the proliferation of co-production options, combined with relatively high failure rates, firms require a deeper insight into the drivers of continued customer use, a key precondition for long-term success. Therefore, this chapter proposes a comprehensive co-production quality typology integrating customer, firm and employee technical as well as functional quality and investigates how these elements relate to co-production satisfaction and ultimately customers' future usage intentions. Further, this study examines how to enhance customers' quality contributions, the least controllable quality element, and turn customers into effective co-producers by means of customer socialization. The findings reveal a positive effect of customer, employee and firm technical quality on outcome satisfaction, thereby highlighting the relevance of each actor for success. On the other hand, only firm and employee functional quality influence process satisfaction. Interestingly, while process satisfaction increases both customer repurchase and future co-production intentions, outcome satisfaction only heightens future co-production intentions. Moreover, all three socialization indicators (i.e., customer role clarity, self-efficacy and motivation) predict customers' technical quality, whereas only motivation affects their functional inputs. Overall, the results help foster high customer performance and guide the management of co-production initiatives for ongoing success. This way, the study aids the development of mutually beneficial co-production initiatives as customers enjoy a satisfying experience and firms gain a better return on their investment.

### **3.1 INTRODUCTION**

Across industries, customers increasingly have the option to actively participate in the firm's production process, thereby co-producing the core offering (Etgar, 2008; Troye & Supphellen, 2012). Co-production can enhance firms' competitive effectiveness as it engenders productivity gains and labour cost reductions, and can result in more satisfied and loyal customers (Auh et al., 2007; Bendapudi & Leone, 2003; Chan et al., 2010). However, firms can only attain these notable economic advantages if their customers adopt and continue to use co-production formats (Meuter, Bitner, Ostrom, & Brown, 2005; Wang et al. 2013). Though attracting customers is a first prerequisite for viable co-production, continued use drives long-term profitability (Wang et al., 2013). Nonetheless, while initial customer adoption is examined in Chapter 2 of this dissertation, the transition to ongoing usage remains rather unexplored.

In this conversion of first-time users to loyal co-producers, the provision of a satisfactory co-production experience through participants' high-quality contributions is essential (Ennew & Binks, 1999; Yim et al., 2012; Yoo, Arnold, & Frankwick, 2012). This is particularly challenging as co-production quality is the result of not only firm and employee contributions but also the customer's own production inputs (Bolton & Saxena-Iyer, 2009; Troye & Supphellen, 2012). By taking on production tasks, the customer becomes a central influencer of co-production quality and, thus, his/her own satisfaction (Bettencourt et al., 2002; Lengnick-Hall, 1996). However, the customer is only partially responsible (Bendapudi & Leone, 2003). The firm and, in many cases, its employees also affect the co-production outcome (Grisseemann & Stokburger-Sauer, 2012; Halbesleben & Stoutner, 2013). Additionally, these three co-production participants can contribute to quality via both technical (i.e., what they do) and functional (i.e., how they do it) inputs (Grönroos, 1995).

Considering the key role of the customer in co-production, an additional complicating factor is that, relative to firm actions or employee behaviours, customer performance is difficult to control and forms the preeminent source of variability and operational inefficiency (Groth, 2005; Halbesleben & Buckley,

2004b). Since customers also often fail to adequately fulfil their co-production role (Tax et al., 2006), better understanding how to effectively manage customer quality contributions is vital to achieve long-term co-production success (Halbesleben & Stoutner, 2013; Kelley et al., 1990).

Given the intricate interplay of participant's contributions in providing a mutually satisfactory co-production experience, the following interrelated research goals guide this study: (1) To propose and empirically test a comprehensive typology of co-production quality, and investigate its elements' impact on key customer evaluations; (2) To assess how customers' contributions to co-production quality can be enhanced. By empirically examining these issues, this chapter contributes to marketing theory and practice in the following ways. First, it advances our understanding of how to create a loyal base of customers favouring co-production. Chapter 2 of this dissertation explored customers' value motives to select the firm's co-production option, thereby enhancing insight in how to attract customers, the initial stage of a customer-firm relationship. The current chapter adds to this knowledge by identifying the drivers of continued customer co-production, thereby enabling firms to take mutually beneficial co-production relationships to the next level. Specifically, the firm's chances of a profitable investment greatly increase, while the advantage for customers lies in the satisfying experience.

Second, by providing a comprehensive typology of co-production quality, capturing the different contributions of the customer, the firm and its employees, this study integrates the piecemeal (empirical) co-production quality literature. So far, customer participation studies have focused on a limited spectrum of co-production quality, namely customer's technical contributions (e.g., Auh et al., 2007; Chan et al., 2010; Dong et al., 2014; Guo et al., 2013). Failing to take into account the various quality contributions of all key players in the co-production experience creates an inaccurate picture of what actually drives co-production satisfaction and continued use.

Third, and synergistically with the second contribution, the development of a co-production quality typology yields a more profound understanding of the co-

production quality – satisfaction – continued use relationship. Building on the logic of the satisfaction - profit chain (cf. Anderson and Mittal, 2000), understanding the link between co-production quality and satisfaction represents a key step towards the financial accountability of co-production initiatives. In a similar vein, the typology's actionable and general applicable nature ensures its managerial relevance.

Fourth, the current study provides guidance on how firms can shape customer quality contributions and turn their customers into highly proficient co-producers. Specifically, capitalizing on the parallels between new employees learning their organizational role and customers taking up their role as co-producers (Bowers & Martin, 2007; Groth, 2005), we build on the theory of organizational socialization to offer firms an actionable set of factors to proactively manage customer quality inputs. In line with the Return on Marketing literature (Rust et al., 2004), this forms a strategic step, as bringing co-production quality under managerial control is imperative to unlock the economic advantages associated with successful co-production initiatives.

The remainder of this chapter is organized as follows. In the next section, we provide an overview of the relevant literature. Subsequently, we introduce our conceptual framework and develop a set of hypotheses regarding the effects of socialization and co-production quality on customer satisfaction and continued use. Thereafter, we describe our research methodology and present the study results. Finally, we discuss the research findings and conclude with several theoretical and managerial implications as well as some directions for future research.

### **3.2 THEORETICAL BACKGROUND**

Generally, existing marketing research agrees on a link between perceived quality, customer satisfaction and behavioural intentions (Anderson & Sullivan, 1993; Caruana, 2002; Cronin & Taylor, 1992). In line with the cognition - affect - conation relationship (Bagozzi, 1992), the more cognitively oriented quality construct is a causal antecedent of customer satisfaction, which represents a



primarily affective reaction (Brady & Robertson, 2001; Choi, Cho, Lee, Lee, & Kim, 2004; Gotlieb, Grewal, & Brown, 1994). In turn, customer satisfaction predicts customers' behavioural intentions (Dabholkar, Shepherd, & Thorpe, 2000; Dagger et al., 2007; Yi & Gong, 2008).

A similar chain of effects has been evidenced in co-production contexts. Ennew and Binks (1999) and Yoo et al. (2012) recognized quality as a prime antecedent of customer satisfaction. Further, co-production research empirically demonstrated the importance of a satisfactory co-production experience for customers' future co-production intentions (Dong et al., 2008; Yim et al., 2012). A detailed elaboration of the co-production quality – satisfaction – continued use chain in this study is presented below.

### **3.2.1 Co-production quality**

Perceived quality represents customers' perceptions of an entity's overall excellence or superiority, resulting from the cognitive comparison of expected and perceived performance (Dagger et al., 2007). The relevance of delivering excellent quality for a firm's long-term success and survival is undisputed (De Keyser & Lariviere, 2014).

In order to develop a comprehensive perspective, it is essential to realize that co-production quality depends on the joint effort of the customer, the firm and, in many cases, its employees (Aggarwal & Basu, 2014; Halbesleben & Stoutner, 2013). In addition, both what and how these actors contribute to the co-production experience is relevant (Halbesleben & Stoutner, 2013; Kelley et al., 1990). Consequently, these two considerations guide the development of our co-production quality typology. Further, to ensure we did not overlook any key constructs, we conducted interviews with several customers (n = 9) and an employee of the firm that forms the setting of our research (i.e., a Belgian do-it-yourself (DIY) firm).

Co-production entails an interdependency between the firm, its employees and the customer. As such, co-production quality is contingent on contributions from each of these actors (Ennew & Binks, 1999; Seiders, Flynn, Berry, & Haws,

2015). This joint influence is inherent to the term co-production, meaning joint production or producing the offering together (Bendapudi & Leone, 2003; Longman, 2003). As active participants in the firm's production process, customers become responsible for the outcome, thereby influencing the quality of co-production and thus their own satisfaction (Bitner et al., 1997; Lengnick-Hall et al., 2000; Meuter et al., 2005). While theoretically well substantiated, existing empirical research merely focuses on the information sharing role of the customer (e.g., Auh et al., 2007; Yim et al., 2012). However, in co-production customers contribute to quality more broadly by providing cognitive labour, physical efforts and emotional inputs (Rodie & Kleine, 2000).

Further, customers actively interact with employee inputs and firms' physical elements and procedures to produce the offering (Bolton & Saxena-Iyer, 2009). During co-production, employees adopt a supportive role and act as consultants (Etgar, 2008; Hilton et al., 2013). In their interactions with customers, employees can influence co-production quality and customer satisfaction depending on their level of competence, how they communicate and behave (Dagger et al., 2007; Ennew & Binks, 1999). Firms support the co-production experience by providing the necessary tools, platforms and structures (Aggarwal & Basu, 2014; Troye & Supphellen, 2012). Hence, viable co-production comprises more than the contributions of customers; firm and employee quality inputs must also be evaluated.

In practice there are abundant examples of co-production initiatives entailing contributions of the customer, the firm and the employee. For instance, travel agencies like Connections and Joker offer assisted travel planning where customers arrange their personal trip with assistance from an employee and info from the firm website and brochures. Further, Selfmatic, DIY Auto Repair Shops and Home Depot's DIY workshops form examples where the firm provides the necessary materials, the customer performs the actual installation and the employee gives tips and advice. Even in self-service technology (SST) environments, there is often an employee available to aid customers, be it face-to-face, by telephone or via an online channel, particularly during the initial implementation phase (Collier & Sherrell, 2010; Wang et al., 2013).

In addition to assessing the different actors contributing to co-production (i.e., customer, firm and employee), it is relevant to consider the different ways in which they contribute to quality as the co-production experience is a function of both process and outcome related factors (van Dolen, de Ruyter, & Streukens, 2008). Grönroos (1995) identified two main forms of quality: technical and functional quality. Technical quality pertains to what is provided and functional quality denotes how the offering is delivered. In other words, while technical quality relates to the quality of the core offering, functional quality describes the customer-firm interaction or the manner in which the core offering is delivered (Bell et al., 2005). Although Grönroos made his distinction with firm and employee quality inputs in mind, it can be extended to cover customer contributions to the quality of a co-production offering (Greer, 2015; Kelley et al., 1990). Firms should invest in improving customer interactions as well as technical quality inputs to create effective co-production initiatives (Lengnick-Hall, 1996). Though both technical and functional quality dimensions are generally positively related to firm evaluations, discerning between them adds value to our research as their relative impact on customer evaluative judgments can differ (Dagger & Sweeney, 2006; De Keyser & Lariviere, 2014).

Combining the above quality assessment approaches, we identify a typology consisting of six aspects of co-production quality (see Figure 9). First, customer technical quality (CTQ) describes what the customer contributes to the co-production offering, ranging from information provided to labour performed (Kelley et al., 1990; Kelley, Skinner, & Donnelly, 1992). In particular, CTQ comprises physical effort, the sharing of information and customers' knowledge and skills (Greer, 2015; Lengnick-Hall, 1996). Second, customer functional quality (CFQ) reflects how the customer acts while co-producing (Kelley et al., 1990). Specifically, it relates to the manner in which the customer interacts with the firm and its employees, such as showing respect and being polite (Kelley et al., 1992; Rodie & Kleine, 2000). Next, employee technical quality (ETQ) represents what the employee adds to the co-production experience (Kelley et al., 1990). This includes employees' level of competence, effort exerted and information shared with the customer (Bettencourt et al., 2002; Dagger & Sweeney, 2006; Kelley et al., 1992). Further, employee functional quality (EFQ)

refers to the way in which the offering is delivered by the employee (Kelley et al., 1990). It comprises the interpersonal elements of the co-production process (e.g., friendliness, responsiveness and honesty) and covers all interactions between the customer and the employee (e.g., face-to-face, via telephone and e-mail, ...). Fifth, firm technical quality (FTQ) encompasses the quality of the different inputs provided by the firm, resembling the “physical product” dimension of Lehtinen and Lehtinen (1991). However, in co-production, firms do not deliver a finished good, rather they act as facilitators by providing customers with necessary inputs (Troye & Supphellen, 2012). Firm technical contributions, for example, consist of necessary tools and materials (e.g., IKEA assembly kit), underlying technologies and interfaces (e.g., self-scanning device and self check-in kiosk) and instructions (e.g., IKEA instruction manual). Finally, firm functional quality (FFQ) entails the elements that facilitate the production of the end product, such as timely and complete deliveries, and clear and accurate invoices (Dagger et al., 2007). This parallels the “physical support” dimension discussed by Lehtinen and Lehtinen (1991). Since these support processes denote how the offering is delivered they describe the functional component of firm quality.

**Figure 9:** Co-production quality typology

Quality actor	Type of quality contribution	
	Technical	Functional
Customer	Customer technical quality (CTQ)	Customer functional quality (CFQ)
Employee	Employee technical quality (ETQ)	Employee functional quality (EFQ)
Firm	Firm technical quality (FTQ)	Firm functional quality (FFQ)

### 3.2.2 Co-production satisfaction

Satisfaction refers to customers’ overall affective reaction to their consumption experience (Cronin et al., 2000; Wang et al., 2013). Understanding how to manage customer satisfaction is vital for sustained co-production success (Eisingerich, Auh, & Merlo, 2014). This is underscored by Wang et al. (2013) who state that customers might disadopt co-production and return to a full-service alternative after a dissatisfying experience.

Satisfaction with the process as well as the outcome of a co-production experience are fundamental aspects for the evaluation of that experience and can differentially impact customers' further evaluative responses (Bendapudi & Leone, 2003). Similarly, Franke and Schreier (2010) argue that customer perceptions of both the co-production process and outcome must be included when evaluating customer behaviour. Consequently, we distinguish between customer satisfaction with the outcome and process of co-production. In parallel with Grönroos' (1995) technical and functional quality concepts, outcome satisfaction refers to satisfaction with the core outcome of co-production, whereas process satisfaction describes satisfaction with how the core co-production offering is delivered.

### **3.2.3 Continued customer co-production**

Two relevant indicators of ongoing co-production use are customers' intention to purchase or use the firm's offering again and customers' intent to co-produce in the future. Recent marketing literature recognizes firm repurchase intention as a prime indicator of customer loyalty and, ultimately, improved firm performance (Larivière et al., n.d.). To further understand the "continued use" concept, it is relevant to also consider future co-production intentions. Customers can not only switch to another firm but also to another service format (e.g., a full-service option). Additionally, the relevance of future co-production intent is salient given the general rise of co-production options.

### **3.2.4 Managing customers' quality contributions**

Since customers do not spontaneously contribute as good as experienced employees, firms should undertake actions to assure that their customers possess the necessary production competences at the start of the co-production task (Mills & Morris, 1986). In view of co-producing customers as partial employees of the firm, employee management models might prove extremely useful to shape customers' behaviours (Bowen, 1986).

Co-production requires customers to engage in new behaviours and brings with it new tasks and responsibilities (Meuter et al., 2005; Yim et al., 2012). Thus, customers must learn the necessary manners and skills to effectively fulfil their

role as a co-producer (Bettencourt et al., 2002; Lengnick-Hall, 1996). As this strongly resembles the process in which new employees must acquire the right attitudes and knowledge to effectively perform their job, anticipatory socialization might help customers adapt to and effectively function in a co-production environment (Bowers & Martin, 2007; Kelley et al., 1990). Nonetheless, as customers and actual employees remain notably different, research needs to empirically determine whether socialization theory is applicable for co-producing customers (Mills & Morris, 1986).

Organizational socialization is the process of gaining the skills, knowledge and attitudes required to become proficient firm members (Köhler, Rohm, de Ruyter, & Wetzels, 2011; Tang et al., 2014). Newcomers need to “learn the ropes”, meaning they must adjust to the organizational values and norms as well as learn the behavioural patterns expected of them (Jokisaari & Nurmi, 2009). Empirical organizational research firmly supports a link between employee socialization and heightened job performance (Bauer, Bodner, Erdogan, Truxillo, & Tucker, 2007; Saks & Ashforth, 1997; Saks, Uggerslev, & Fassina, 2007).

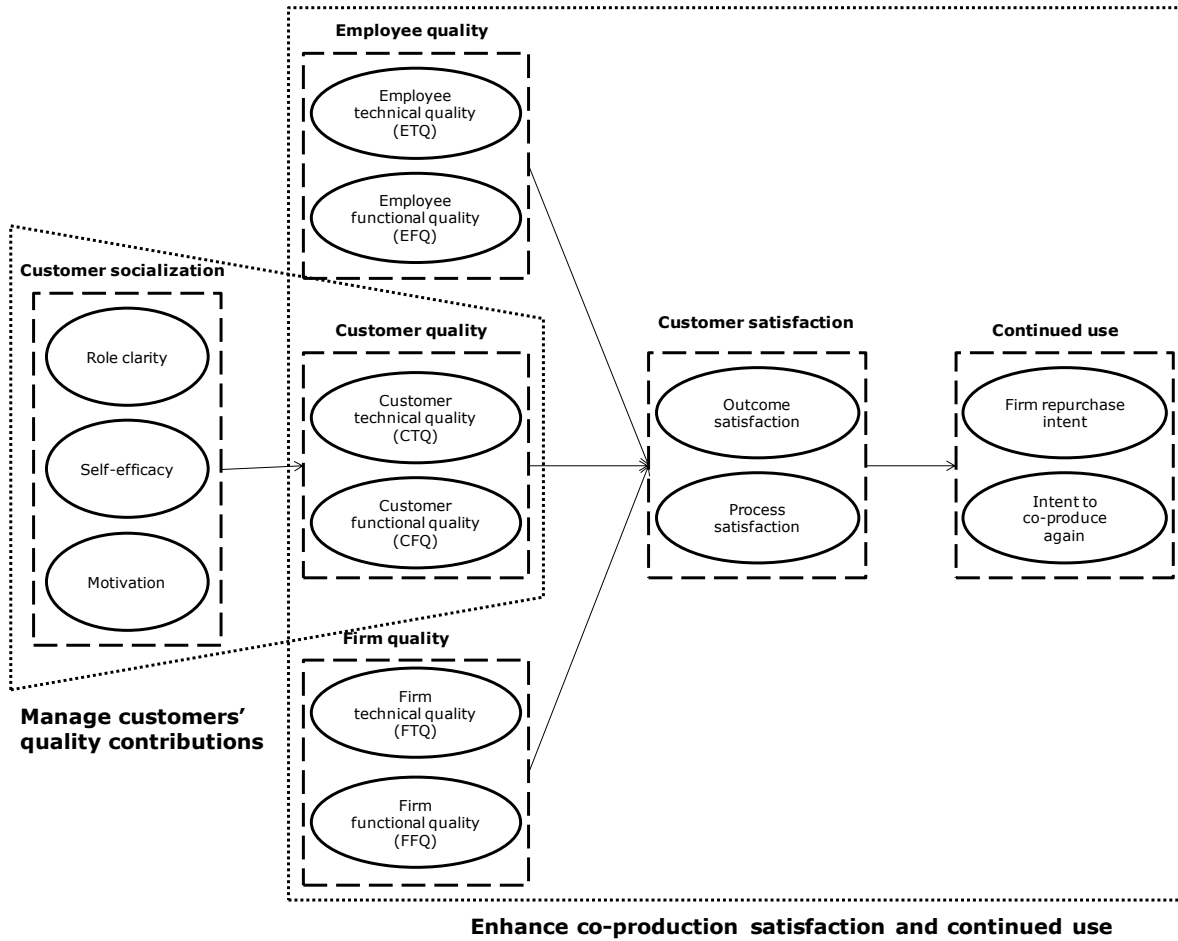
Compared to this myriad of employee research, empirical proof for a relationship between socialization and performance in a customer co-production arena only started emerging. Groth (2005), measuring socialization as one global, overarching process, observed a positive effect of socialization on the execution of relevant co-production tasks. However, a composite conceptualization, representing the distinct processes of customer socialization, provides a more detailed picture (Bauer et al., 2007; Köhler et al., 2011). Hence, by adapting the employee socialization model to a co-production context, we identify and assess three related but distinct processes of customer socialization: gaining an understanding of what to do and how to behave, acquiring confidence in your capabilities, and becoming willing to perform (Bettencourt et al., 2002; Meuter et al., 2005). These three processes are captured by the constructs role clarity, self-efficacy and motivation. Extant research emphasizes that these factors are crucial for effective co-production (Bowen, 1986; Lengnick-Hall et al., 2000).

First, socialization enhances customers' understanding of their responsibilities and how to perform their co-production role (Guo et al., 2013). Second, through socialization, customers gain confidence in their ability to successfully carry out the required co-production tasks (Köhler et al., 2011). Third, socialization motivates customers to execute their tasks well (Kelley et al., 1990). This way, the socialization of customers affects their co-production contributions, co-production quality and, eventually, co-production satisfaction (Groth, 2005). Together, the three processes reflect customer readiness to take on the co-production role, meaning the extent to which the customer feels prepared to effectively perform the co-production task (Meuter et al., 2005; Verleye et al., 2014). High role readiness promotes adequate contributions whereas a lack of role readiness may stimulate unsuitable customer behaviours and, thus, potentially harms co-production outcomes (Lengnick-Hall, 1996; Yoo et al., 2012).

### **3.3 CONCEPTUAL FRAMEWORK AND HYPOTHESES DEVELOPMENT**

Building on the literature discussed in the previous section, Figure 10 presents the conceptual model that underlies the current study. The model depicts how customer, employee and firm quality exert an influence on customer satisfaction and, subsequently, on continued use of the firm's offering as well as co-production in general. All three co-production quality elements consist of a technical and functional aspect. Finally, three customer socialization aspects – role clarity, self-efficacy and motivation – are proposed as antecedents of customer quality. These relationships are explained in further detail below.

**Figure 10:** Basic co-production quality framework





### **3.3.1 Effects of co-production quality elements**

As indicated by the co-production quality typology, developed in the theoretical background section, the quality of the co-production experience is influenced by contributions of the customer, the firm and the firm's employees.

***Customer quality contributions*** In their role as co-producers, customers actively perform one or more production tasks, thereby substantially influencing the quality of the experience and, thus, their own satisfaction (Lengnick-Hall, 1996; Meuter et al., 2005). Only if customer contributions are of sufficient quality and quantity, co-production can be advantageous (Greer, 2015; Halbesleben & Stoutner, 2013). In contrast, customers' failure to adequately contribute can severely hinder value creation, produce an unsatisfactory experience and have adverse financial consequences for the firm (Halbesleben & Buckley, 2004b; Tax et al., 2006).

Customers' technical quality inputs can promote outcome satisfaction in two ways. First, psychological responses to co-producing can improve customers' outcome evaluations. By contributing to the production of an offering, customers fulfil their fundamental need to signal a competent identity to themselves and others (Mochon et al., 2012). Subsequently, these feelings of competence lead to enhanced customer appraisals of the co-production outcome. In addition, Troye and Supphellen (2012) found co-production to positively bias customers' perceptions and evaluations of the outcome as a result of associative self-anchoring. Actively producing an offering forms powerful associations between the co-produced outcome and the self, through which positive affect is transferred from the self to the outcome. Similarly, according to Atakan et al. (2014), a co-produced offering becomes part of customers' extended self due to the invested time and production effort (i.e., physical and mental). Since individuals develop an affective attachment to and/or cognitive identification with objects connected to the self, customers' co-production quality contributions can heighten outcome judgments.

Second, customers' fulfilment of required tasks increases satisfaction via its positive influence on the attainment of desired outcomes (Dellande et al., 2004).

Customer quality contributions foster co-production satisfaction by enhancing *"the likelihood that needs are met and the benefits the customer seeks are actually attained"* (Zeithaml, Bitner, & Gremler, 2006, p. 397). As specified by Aggarwal and Basu (2014), the effort customers expend improves the service outcome and, in turn, increases their satisfaction. Halbesleben and Stoutner (2013) further described how customer performance - in the sense of sharing useful information - engenders a more beneficial outcome and higher customer satisfaction. Also, Chan et al. (2010) discovered that participating by providing information and being involved in decision-making leads to satisfaction when the co-production offering provides economic and relational advantages to the customer. In contrast, customers withholding relevant resources (e.g., effort or information) impede a satisfactory outcome (Greer, 2015). Meuter et al. (2000) report customers' own deficient actions as a determinant of a dissatisfying co-production event. Seiders et al. (2015) share this view by arguing that not following firm guidelines can have adverse consequences and lead to suboptimal outcomes. Consequently, customer technical quality inputs likely improve outcome satisfaction.

Besides providing useful information, effort and skills, customers contribute to quality by their functional behaviour (Kelley et al., 1990, 1992). Amiable and responsive customer conduct facilitates a pleasant and positive interaction environment. Further, customers' display of positive emotions during the co-production experience might directly induce their own positive evaluations (Mattila & Enz, 2002). According to Kellogg, Youngdahl and Bowen (1997), customer relationship building efforts, such as being kind and friendly, are frequently related to satisfying encounters. From the opposite perspective, poor customer functional quality leads to negative employee - customer interactions and hinders smooth operations (Kelley et al., 1990). Greer (2015) argues that customers' interpersonal misbehaviour obstructs value creation and, thus, impedes a successful participative experience. Similarly, Stock and Bednarek (2014) linked negative and unpleasant customers behaviours to reduced customer satisfaction. Therefore, customers who are friendly and respectful likely are more satisfied with the co-production process.

This results in the following hypotheses:

H1: Customer technical quality (CTQ) positively influences outcome satisfaction.

H2: Customer functional quality (CFQ) positively influences process satisfaction.

***Employee quality contributions***

Due to employees' boundary-spanning function, employee attitudes and conducts strongly affect customer quality perceptions, customer satisfaction and, ultimately, firm performance (Babakus, Yavas, & Ashill, 2009; Dagger et al., 2007). Similar to full-service delivery modes, employee technical and functional quality inputs, such as knowledge, responsiveness and friendliness, can play a salient role in a co-production context. For instance, when performing home improvement tasks, working together with a skilled and honest professional probably leads to a more satisfactory co-production experience.

Since effective technical contributions from employees (e.g., relevant expertise and correct information) facilitate a superior co-production outcome, they improve customers' satisfaction with the outcome. Ennew and Binks (1999) empirically established a positive relationship between bank managers' participative behaviours and customer satisfaction. Further, Gallan et al. (2013) observed a positive impact of employee expertise and capability on customer satisfaction with the experience. Thus, whether or not customer participation creates a pleasant experience depends on customers' perceptions of employee ability (Yim et al., 2012). For example, in a study by Dong et al. (2014), one respondent noted that she is less satisfied with her participation when employees lack the necessary skills.

Besides possessing the necessary technical capabilities, employees involved in co-production should also display several functional qualities (Bettencourt et al., 2002). A courteous and respectful treatment by employees can heighten customer satisfaction (Gallan et al., 2013). An emotional contagion process provides a potential theoretical explanation for this relationship (Hatfield, Cacioppo, & Rapson, 1994). Employees' positive attitudes during interactions are

unconsciously 'caught' and mimicked by customers and induce positive affect or a favourable mood (Barger & Grandey, 2006; Pugh, 2001). This positive affect then increases customers' satisfaction, since individuals use their affective state as an evaluative cue (Forgas, 1995). In a similar vein, when a contact employee demonstrates superb functional quality behaviours, this will infect customers and create positive feelings that, in turn, will enhance process satisfaction. Moreover, if there is too little employee support when using a co-production option, customers can experience a lack of control, causing frustration and abandonment of the option (Collier & Sherrell, 2010).

A capable employee making an effort to offer relevant information and advice affects the co-production outcome whereas a friendly and helpful attitude contributes to an enjoyable process. Hence, employee technical quality likely improves customer outcome satisfaction, while their functional quality likely promotes process satisfaction.

Therefore, we hypothesize that:

H3: Employee technical quality (ETQ) positively influences outcome satisfaction.

H4: Employee functional quality (EFQ) positively influences process satisfaction.

### ***Firm quality contributions***

Finally, the quality of the firm's tangible products (i.e., technical quality) and business processes (i.e., functional quality) form components of co-production quality. Firms providing high-quality materials, helpful websites and brochures or handy self-service devices increase the likelihood of a favourable outcome and, consequently, heighten customers' outcome satisfaction. Further, smooth firm operations, such as efficient order and invoicing procedures, can make the co-production process more agreeable.

In a study on self-service technologies, Meuter et al. (2000) discovered that clear instructions and a straightforward process contribute to a satisfying experience, whereas both technology design and process design problems and failures cause a dissatisfying encounter. Several other studies in a SST setting

relate how easy to use and effective a self-service technology is to customer evaluations (Dabholkar & Bagozzi, 2002; Dabholkar, 1996; Lin & Hsieh, 2011). Additionally, in a DIY environment, Troye and Supphellen (2012) mention the importance of DIY kits for customers to produce outcomes for themselves.

Accordingly, higher quality of input components should lead to a better outcome and, thus, higher outcome satisfaction, while trouble-free business operations likely enhance process satisfaction.

This leads to the following hypotheses:

H5: Firm technical quality (FTQ) positively influences outcome satisfaction.

H6: Firm functional quality (FFQ) positively influences process satisfaction.

***Customer satisfaction and continued use*** We also consider the effect of co-production quality, via customer satisfaction, on two prime performance outcomes: firm repurchase intent and intent to co-produce again. Consistent with prior research on customer participation, we expect customer (outcome and process) satisfaction to positively influence customer intent to reuse the firm's offering and to engage in co-production again (Ennew & Binks, 1999; Wang et al., 2013; Yim et al., 2012).

Consequently, we hypothesize that:

H7: Outcome satisfaction positively influences a) firm repurchase intent and b) intent to co-produce again.

H8: Process satisfaction positively influences a) firm repurchase intent and b) intent to co-produce again.

### **3.3.2 Effects of customer socialization**

Next, we dig deeper into how firms can manage customer performance by examining the effect of three related socialization indicators on customer quality contributions: role clarity, self-efficacy and motivation. These are recognized as key drivers of effective co-production (Bettencourt et al., 2002; Bowen, 1986; Lengnick-Hall, 1996).

**Role clarity** First of all, to contribute effectively, customers must know what is expected of them in their role as a co-producer (Köhler et al., 2011). They need to understand the organizational rules and policies and which tasks to carry out. According to role theory, individuals' degree of role clarity guides their behaviour and affects their performance (Guo et al., 2013; Jokisaari & Nurmi, 2009). Customers with high role clarity have a good idea of their co-production responsibilities and the actions required to achieve their goals. As such, they are more likely to do what is needed (Lengnick-Hall et al., 2000) and, thus, more likely to share the necessary information, exert the right amount of effort and perform the tasks correctly. On the other hand, contributions to quality should be lower for customers lacking role clarity due to their poor knowledge of the necessary production activities (Jokisaari & Nurmi, 2009).

Furthermore, socialization includes not only what customers should do, but also how they should behave. Besides acquiring insight in the tasks to be performed, customers learn the values and norms of the organization as well as how to interact with employees (Kelley et al., 1990). They acquire the social knowledge to become proficient members of the organization (Van Maanen & Schein, 1979). Overall, clearer role perceptions promote customer contributions that lead to better outcomes (Auh et al., 2007).

Therefore, as customers become more clear about their role in the co-production experience, their technical and functional quality is expected to increase.

**Self-efficacy** Next to being clear on what to do, customers must believe they possess the necessary skills to participate effectively (Bettencourt et al., 2002; Köhler et al., 2011). Consistent with social cognitive theory, self-efficacy determines an individual's persistence in the face of obstacles as well as the amount of effort spent on a task (Bandura, 1986). Thus, high self-efficacy leads to a greater allocation of resources to a task, whereas the perceived inability to fulfil the task reduces the effort devoted to it (Bandura, 1997). Through these effects, self-efficacy is a key driver of human behaviour and a robust predictor of individual performance (Stajkovic & Luthans, 1998). According to psychology literature, self-efficacy improves people's achievement

of tasks for which they need to acquire new skills (van Beuningen et al., 2009). As it marks an individual's adjustment to a new role (Bandura, 1977; T. N. Bauer et al., 2007), self-efficacy is also relevant for customers to effectively adapt to their new role as a co-producer. Thus, as partial employees in co-production (Bendapudi & Leone, 2003), customers' beliefs in their abilities to successfully fulfil the co-production task should heighten their effective contributions. For example, self-efficacy heightens customer perceived performance in using an investment trading SST (van Beuningen et al., 2009). Following this reasoning, we anticipate a positive relationship between customer self-efficacy and customer technical quality.

**Motivation** Finally, customer quality contributions depend on their motivation to participate (Bettencourt et al., 2002; Lengnick-Hall, 1996). Motivation reflects customers' desire to acquire the benefits and rewards of co-production and conveys their willingness to perform the necessary tasks (Meuter et al., 2005). According to Büttgen et al. (2012), customers' motivation to co-produce predicts their actual contributions. Motivated customers will perform the expected co-production activities and exert more effort to reach their goal. Kelley et al. (1992), for example, posit that customers' motivational direction heightens their technical quality. Further, Auh et al. (2007) suggest that motivation increases customers' cooperative efforts. As a result, customer motivation is expected to enhance customer technical as well as functional quality.

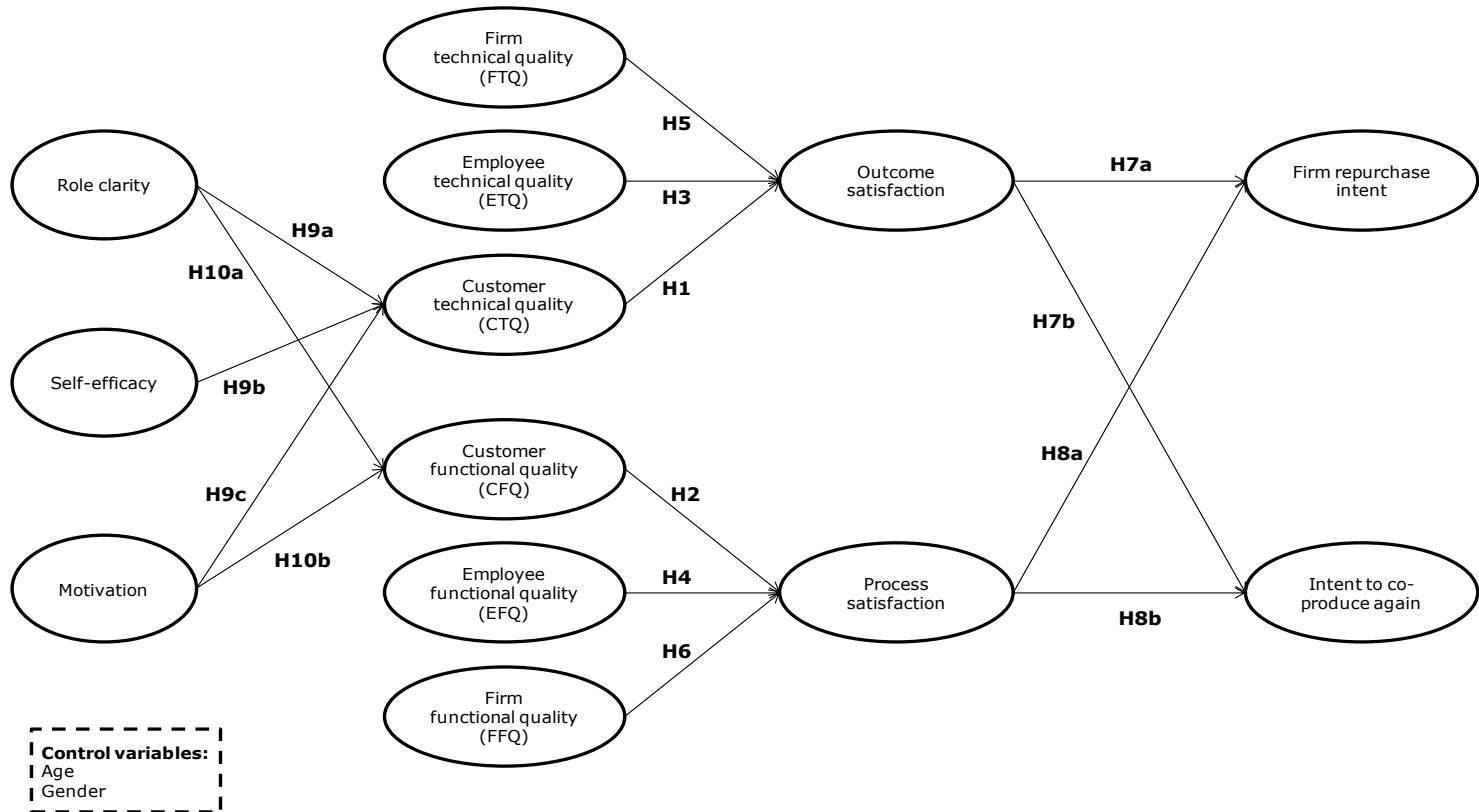
Based on the above reasoning, we hypothesize the following:

H9: Customer a) role clarity, b) self-efficacy and c) motivation positively influence customer technical quality (CTQ).

H10: Customer a) role clarity and b) motivation positively influence customer functional quality (CFQ).

Combined, these hypotheses result in the detailed conceptual framework depicted below (see Figure 11).

**Figure 11: Detailed co-production quality framework**





## **3.4 RESEARCH METHODOLOGY**

### **3.4.1 Research setting and data collection**

To test our hypotheses, we chose a do-it-yourself setting. The otherwise very labour-intensive production process makes co-production in a DIY context extremely relevant due to the potentially large economic benefits for firms (i.e., cost savings and productivity gains) (Auh et al., 2007).

A Belgian DIY firm was contacted in order to collect data for our study. The firm specialises in the guided installation of heating, plumbing and ventilation systems in new and existing houses. The customer has to carry out the actual installation of the system. However, he or she receives assistance from the firm and its employees. The firm provides the necessary installation materials as well as the required specialised equipment and gives general instruction guides. The firm's employees go through the installation plan together with the customer, are available for questions, can do occasional installation checks and handle the final inspection of the installation before its commissioning. Several firms in Belgium already offer a similar DIY concept.

This specific setting forms an appropriate study context as the co-production experience demands contributions from the customer (e.g., physical effort and a detailed plan of the house), the firm (e.g., proper materials and accurate installation plans) and the employees (e.g., installation advice and problem assistance). Additionally, as customers take on installation tasks, they must learn new skills and knowledge, making socialization relevant.

We obtained a list of customers who finished a DIY installation project in the last three and a half years ( $n = 484$ ). We only sampled these customers, so there is an increased likelihood that they can recall their experiences and comment on the quality of the offering. All customers received a letter, in which the firm requested them to participate in a customer survey, conducted to improve the firm's do-it-yourself concept. Shortly after, we sent an e-mail with the link to the online questionnaire. Both the letter and the e-mail emphasized that participation was voluntary and assured the full confidentiality of customers'

responses. The letter and e-mail further mentioned that respondents would receive a reward in the form of a gift certificate for a Belgian DIY chain. Two weeks after the initial distribution, a reminder mail was directed to the customers who had not yet completed the questionnaire. In total, we received 158 responses, representing a satisfactory response rate of 32.6 percent. After cleaning of the data, 149 usable questionnaires remained, indicating a response rate of 30.8 percent. The mean age of the respondents was 36 years ( $SD = 9.3$ ) and the majority of them were men ( $n = 129$ ; 86.6%). Due to the specific DIY research setting this skewed gender division is not regarded abnormal.

### **3.4.2 Questionnaire design**

To measure the constructs, we used existing scales where possible and adapted their wording to fit the setting at hand. Unless otherwise indicated, all constructs were measured on a 9-point Likert-type scale with the anchors "Strongly disagree" (1) and "Strongly agree" (9). For the customer socialization indicators, we used 4 items measuring role clarity from Köhler et al. (2011), 5 items measuring self-efficacy from Meuter et al. (2005) and 5 items measuring motivation from Dellande et al. (2004).

Regarding technical quality, we evaluated employee and customer expertise by adjusting the scale of Stock and Hoyer (2005), employee and customer effort by a 5-item scale drawn from Mohr and Bitner (1995), and employee and customer information sharing using a 4-item scale developed by Yi and Gong (2013). Employee functional quality was assessed using 7 items from the reliability, assurance, responsiveness and empathy dimensions of the SERVQUAL scale (Parasuraman, Zeithaml, & Berry, 1988), and 2 items developed from the customer interviews. For customer functional quality, we adapted 5 items from the reliability, assurance, responsiveness and empathy dimensions of SERVQUAL (Parasuraman et al., 1988), and used the anchors "Never" and "Always" to reduce the risk of social desirability bias (Büttgen et al., 2012). For firm technical quality (i.e., materials, equipment and installation plans) as well as firm functional quality (i.e., invoicing operations, and ordering and delivery procedures), we used the interviews with the firm's customers and employee to select items that suit the study's specific DIY context.

To assess customer evaluative judgments, we employed 9-point semantic differential scales. Following Bendapudi and Leone (2003), the customer satisfaction scales (i.e., process and outcome) consisted of one item with the endpoints "Very dissatisfied - Very satisfied". To capture both reuse intentions, we employed two items with the endpoints "Very unlikely - Very likely" and "Definitely not - Definitely yes" (Hui, Zhao, Fan, & Au, 2004). Table 13 presents the correlations between the model constructs. A detailed overview of all scale items can be found in this chapter's Appendix A.

Finally, we controlled for respondents' gender and age as prior research indicated that these can influence the relationship between customer satisfaction and loyalty (Auh et al., 2007; Mittal & Kamakura, 2001).

**Table 13:** Construct correlations

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
1. Customer effort	1.00																
2. Customer expertise	.17	1.00															
3. CFQ	.31	.32	1.00														
4. Customer info sharing	.32	.51	.60	1.00													
5. Employee effort	.28	.20	.22	.17	1.00												
6. Employee expertise	.13	.25	.17	.12	.80	1.00											
7. EFQ	.19	.28	.25	.18	.81	.77	1.00										
8. Employee info sharing	.29	.31	.21	.18	.79	.71	.74	1.00									
9. FFQ	.11	.36	.19	.19	.47	.59	.56	.45	1.00								
10. FTQ	.37	.24	.37	.41	.40	.33	.36	.38	.36	1.00							
11. Intent to co-produce again	.25	.40	.28	.29	.26	.26	.23	.34	.13	.27	1.00						
12. Motivation	.26	.49	.43	.49	.15	.16	.14	.17	.09	.27	.33	1.00					
13. Outcome satisfaction	.31	.47	.28	.45	.38	.38	.37	.30	.32	.48	.36	.39	1.00				
14. Process satisfaction	.16	.40	.19	.17	.57	.59	.61	.66	.52	.32	.43	.27	.40	1.00			
15. Repurchase intent	.22	.22	.22	.14	.71	.75	.66	.66	.63	.40	.37	.19	.35	.69	1.00		
16. Role clarity	.23	.42	.24	.22	.45	.44	.42	.54	.38	.33	.36	.34	.24	.55	.46	1.00	
17. Self-efficacy	.07	.69	.23	.33	.20	.25	.23	.26	.27	.25	.36	.48	.35	.31	.22	.43	1.00

### **3.4.3 Analytical approach**

We tested our hypotheses using a partial least squares approach to structural equation modelling (PLS-SEM) and, more specifically, the SmartPLS 3 software package (Ringle et al., 2015). The reasons for this decision are as follows (Hair et al., 2012). First, next to reflective constructs, the PLS-SEM methodology is well suited to estimate formative constructs, which are present in our theoretical framework (e.g., technical and functional firm quality). Second, the PLS-SEM estimation procedure suits our exploratory study goal extremely well (i.e., investigate the drivers of co-production satisfaction and continued use).

In line with extant research, we modelled employee and customer technical quality as higher-order constructs. Based on the decision criteria of Jarvis et al. (2003), they are operationalized as formative second-order constructs with expertise, effort and information sharing as reflective first-order components. Likewise, the customer evaluative judgments (i.e., satisfaction and behavioural intentions) and the socialization factors (i.e., role clarity, self-efficacy and motivation) are modelled as reflective first-order constructs. In contrast, technical and functional firm quality represent first-order formative constructs.

To operationalize our second-order model constructs, we used the two-stage estimation approach proposed by Reinartz et al. (2004). For data analysis purposes, we employed the default PLS algorithm settings (i.e., path weighting scheme, 300 iterations and stop criterion of  $1 \times 10^{-7}$ ) (Hair et al., 2014). To assess the statistical significance of the parameter estimates, we composed percentile bootstrap confidence intervals based on 5000 samples (Hair et al., 2011; Preacher & Hayes, 2008).

## **3.5 RESULTS**

### **3.5.1 Measurement model evaluation**

The assessment of the constructs' psychometric properties was based on the directives of Leroi-Werelds et al. (2014) and Hair et al. (2014) and is outlined below.

**Reflective constructs** First of all, we determined the unidimensionality of the latent variables in our framework by verifying that a single construct underlies their respective set of items. Subsequently, as each construct's composite reliability exceeded the 0.708 threshold, internal consistency reliability was demonstrated. Next, we established indicator reliability by evaluating the magnitude of the measurement items (loadings > .708) and confirming that they all load significantly on their respective latent variables. Furthermore, we assessed convergent validity using the average variance extracted (AVE). Each reflective model construct displayed desirable values (i.e., AVE > .50). Finally, discriminant validity for every latent variable was supported by means of the HTMT<sub>90</sub> criterion (Henseler et al., 2015).

**Formative constructs** First, as affirmed by low variance inflation factors (VIF < 5), multicollinearity was no issue for any of the four formative constructs in our framework (i.e., FTQ, FFQ and the second-order latent variables CTQ and ETQ). Second, all construct indicators were deemed statistically significant, thereby providing evidence for indicator reliability. Finally, we demonstrated discriminant validity by ascertaining that an absolute value of 1 does not fall within two standard errors of the latent variable correlations.

Overall, our data exhibit excellent psychometric properties. A more detailed overview of the data characteristics is provided in Appendix A to this chapter.

### **3.5.2 Structural model evaluation**

Now we have verified both the reliability and validity of the measurement scales, an evaluation of the structural model relationships is warranted. Our co-production quality framework is well able to predict customer satisfaction and future usage intentions (see Table 14). The accompanying confidence intervals reveal that the coefficient of determination ( $R^2$ ) of each endogenous construct is significantly different from zero. The socialization factors account for 51% of the variance in customer technical quality and 19% of the variance in customer functional quality. Turning to customer evaluative judgments, the co-production quality elements explain respectively 43% and 41% of the variance in outcome and process satisfaction. Finally, customer satisfaction describes 50% of the

variance in customers' intentions to reuse the firm's offering and 23% of the variance in their intent to co-produce in the future.

**Table 14:** Predictive validity of the socialization and co-production quality framework

Predictive validity		
	R <sup>2</sup>	95% CI <sup>a</sup>
Customer technical quality	.51	[.41;.64]
Customer functional quality	.19	[.09;.36]
Outcome satisfaction	.43	[.32;.62]
Process satisfaction	.41	[.30;.58]
Repurchase intent	.50	[.38;.64]
Intent to co-produce again	.23	[.11;.41]

<sup>a</sup> 95% percentile bootstrap confidence interval based on 5000 bootstrap samples

As the predictive validity of our research framework is adequate, we can assess our study hypotheses by looking at the structural relationships of the model (see Table 15).

**Table 15:** Overview of structural model relationships

Hypothesized relationship	Path coefficient $\beta$	Confidence interval <sup>a</sup>	Supported?
H1 CTQ → Outcome satisfaction (+)	.41	[.20;.63]***	Yes
H2 CFQ → Process satisfaction (+)	.02	[-.09;.14]	No
H3 ETQ → Outcome satisfaction (+)	.22	[.01;.41]***	Yes
H4 EFQ → Process satisfaction (+)	.45	[.20;.68]***	Yes
H5 FTQ → Outcome satisfaction (+)	.28	[.01;.51]**	Yes
H6 FFQ → Process satisfaction (+)	.25	[.01;.49]***	Yes
H7a Outcome satisfaction → Repurchase intent (+)	.08	[-.07;.21]	No
H7b Outcome satisfaction → Intent to co-produce again (+)	.22	[.03;.44]**	Yes
H8a Process satisfaction → Repurchase intent (+)	.64	[.45;.80]***	Yes
H8b Process satisfaction → Intent to co-produce again (+)	.33	[.04;.59]***	Yes
H9a Role clarity → CTQ (+)	.13	[.001;.27]**	Yes
H9b Self-efficacy → CTQ (+)	.45	[.20;.65]***	Yes
H9c Motivation → CTQ (+)	.29	[.07;.54]***	Yes
H10a Role clarity → CFQ (+)	.10	[-.02;.26]	No
H10b Motivation → CFQ (+)	.39	[.18;.59]***	Yes

<sup>a</sup> Percentile bootstrap confidence interval based on 5000 bootstrap samples

\* CI 90%; \*\* CI 95%; \*\*\* CI 99%

The majority of research hypotheses is affirmed by the data. Customer technical quality ( $\beta = .41$ ,  $CI_{99\%} = [.20;.63]$ ), employee technical ( $\beta = .22$ ,  $CI_{99\%} = [.01;.41]$ ) as well as firm technical quality ( $\beta = .28$ ,  $CI_{95\%} = [.01;.51]$ ) exerted

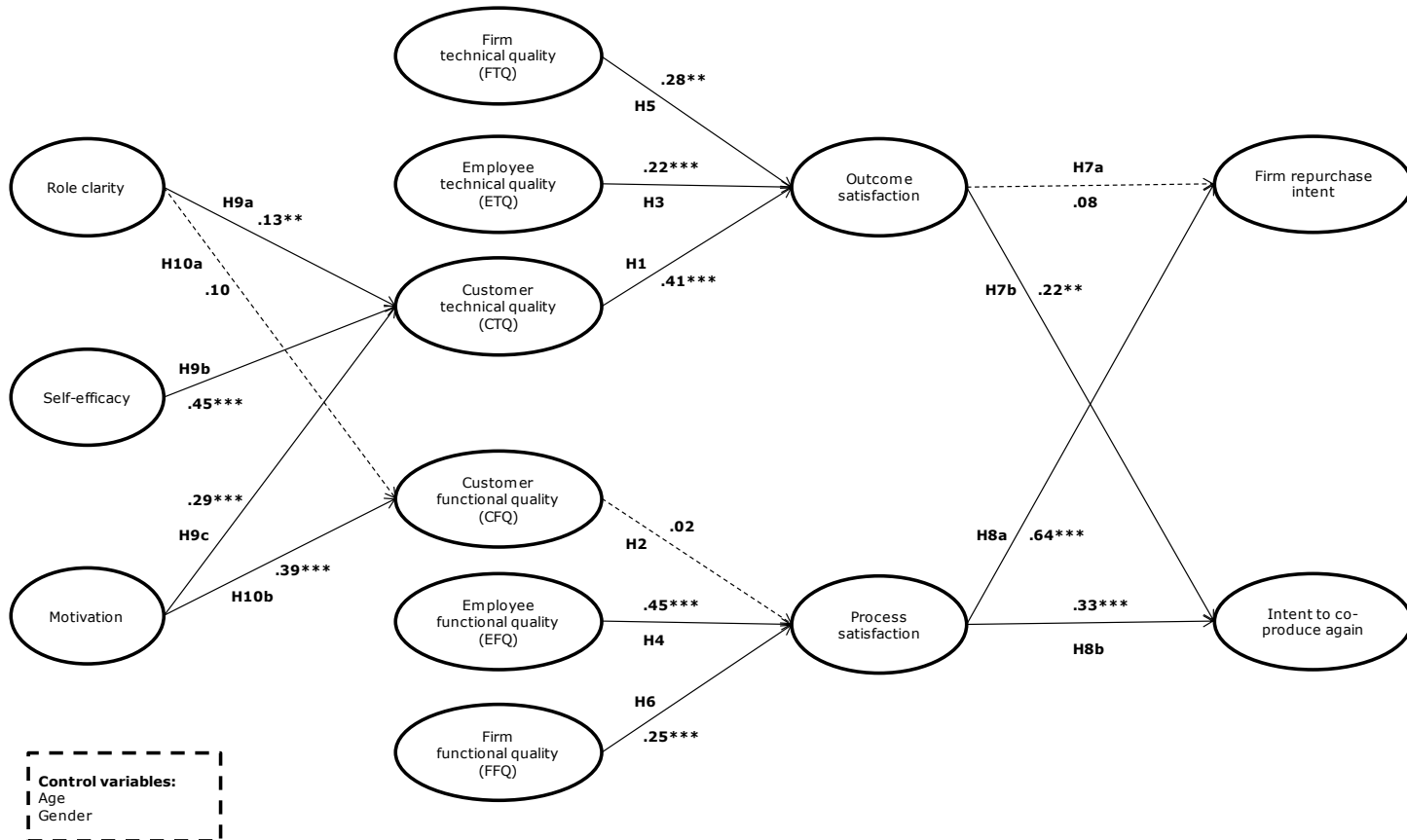
a significant positive influence on customers' satisfaction with the co-production outcome, thereby providing support for hypotheses H1, H3 and H5. On the other hand, only employee functional quality ( $\beta = .45$ ,  $CI_{99\%} = [.20;.68]$ ) and firm functional quality ( $\beta = .25$ ,  $CI_{99\%} = [.01;.49]$ ) substantially heightened customer process satisfaction, whereas customer functional quality ( $\beta = .02$ ,  $CI_{90\%} = [-.09;.14]$ ) did not affect process satisfaction. Thus, the data support hypotheses H4 and H6, but not hypothesis H2. Next, hypothesis H7b is substantiated as we detected a positive link between the level of outcome satisfaction and customer willingness to again execute similar tasks themselves ( $\beta = .22$ ,  $CI_{95\%} = [.03;.44]$ ). However, outcome satisfaction did not promote customers' intention to work with the firm in the future ( $\beta = .08$ ,  $CI_{90\%} = [-.07;.21]$ ). Hence, we can not verify hypothesis H7a. Contrary to the effects of outcome satisfaction, customer satisfaction with the co-production process was observed to affect both firm repurchase intent ( $\beta = .64$ ,  $CI_{99\%} = [.45;.80]$ ) and intent to co-produce again ( $\beta = .33$ ,  $CI_{99\%} = [.04;.59]$ ), thus validating hypotheses H8a and H8b. Turning our attention to the antecedents of customer quality, we find strong support for a positive effect of socialization on customer technical quality. Role clarity ( $\beta = .13$ ,  $CI_{95\%} = [.001;.27]$ ), self-efficacy ( $\beta = .45$ ,  $CI_{99\%} = [.20;.65]$ ) and motivation ( $\beta = .29$ ,  $CI_{99\%} = [.07;.54]$ ) all increased technical inputs by the customer, as such supporting hypotheses H9a, H9b and H9c. Finally, only partial evidence is found for hypothesis H10, concerning the impact of socialization indicators on customer functional inputs. Customers' motivation to co-produce substantially improved their functional quality contributions ( $\beta = .39$ ,  $CI_{99\%} = [.18;.59]$ ). In contrast, role clarity did not promote customer functional quality ( $\beta = .10$ ,  $CI_{90\%} = [-.02;.26]$ ). The structural model results are visually represented in Figure 12.

### **Control variables**

Regarding our two control variables (i.e., gender and age), the data only revealed a significant impact of customers' age on repurchase intent ( $\beta = .11$ ,  $CI_{95\%} = [.03;.21]$ ). Older customers are more likely to work with the firm again. We also estimated our conceptual framework without control variables, but this affected nor the significance nor the direction of the hypothesized relationships.



**Figure 12:** Estimated co-production quality framework



\* CI 90%; \*\* CI 95%; \*\*\* CI 99%

Note: Statistically insignificant relationships are indicated by dotted lines.

### 3.5.3 Discussion

Overall, the results substantiate our conceptual framework and underline the salience of high co-production quality for fostering customer satisfaction and, in turn, continued use. Starting with the satisfaction – behavioural intent relationship, we find evidence for a differential impact of satisfaction on customer continued use intentions. Customers' process satisfaction displayed a significant effect on both firm reuse and future co-production intent, while outcome satisfaction only affected customers' future co-production plans. Hence, co-production process satisfaction appears especially relevant for creating a loyal customer base.

However, despite the lack of a significant relationship with firm repurchase intent, outcome satisfaction might still be salient for engendering customer loyalty. Outcome satisfaction possibly represents a qualifying factor or 'dissatisfier', meaning that low outcome satisfaction strongly reduces firm repurchase intent, but high outcome satisfaction does not increase it (Johnston, 1995). This effect is well accepted in regular service contexts (Hui et al., 2004) but, also in a co-production context, some studies already suggested beneficial outcome elements as necessary but not sufficient for creating a favourable experience (Franke & Schreier, 2010; van Dolen et al., 2008). Alternatively, the insignificant influence of outcome satisfaction on customers' repurchase intentions may be due to the generally high outcome satisfaction in our sample ( $M = 7.72$ ,  $SD = 1.07$ ). According to attribution theory (Folkes, 1988; Weiner, 1986), how individuals judge the cause of an event and assign the blame has extensive consequences for their evaluations and behaviour. A persons' causal attributions of a favourable or unfavourable co-production outcome form the basis for his/her decisions about how to act (Meuter et al., 2000). Specifically, following the self-serving bias (Bendapudi & Leone, 2003), co-producing customers claim the responsibility for a successful outcome and do not give their production partner enough credit. In contrast, in case of a suboptimal outcome they assign part of the blame to the firm. As a result, only low outcome satisfaction displays a significant effect on customers' repurchase intent. When outcome satisfaction is high, no substantial influence is uncovered. Hence,

regardless of the insignificant effect in our study, we strongly believe a satisfactory outcome is required for gaining loyal customers.

Turning to the co-production quality – satisfaction link, the findings strongly support our co-production quality typology as they evinced that customer satisfaction depends on the quality inputs of all co-production participants: the customer, the firm and its employees. Based on a post-hoc examination (see Appendix B), customer, employee and firm technical quality play an equally important role in predicting outcome satisfaction. Thus, in addition to high firm technical quality (e.g., good materials and equipment), an effective co-production outcome requires adequate technical quality on the part of the customer and the employee (i.e., expertise, effort and information). On the other hand, process satisfaction is evenly driven by employee (e.g., being friendly and responsive) and firm (e.g., smooth procedures) functional behaviour, whereas customers' functional attitudes exert no influence on their contentment with the process.

To gain a deeper insight in their influence, we consider the quality element's total effects on customer continued use intentions (see Appendix B). Interestingly, besides customer functional behaviour, all quality elements significantly and equally affect customers' future co-production intentions. In contrast, reusing the firm's co-production option is only affected by employee and firm functional quality. This sounds promising, since, opposed to customer performance, these quality elements fall under strict managerial control. Nevertheless, considering the real opportunity of outcome satisfaction being a 'dissatisfier', firms should not neglect the management of their customers.

Finally, assessing the drivers of customer quality, the results clearly affirm the value of socializing customers to their co-production role. Though role clarity, self-efficacy and motivation to co-produce all are significant predictors of customer technical quality, a post-hoc evaluation points out self-efficacy as a dominant driver (see Appendix B). Firms must ensure that their customers have a clear understanding of the required activities and responsibilities, belief they possess the necessary skills and be motivated to successfully fulfil their tasks. In

contrast, a strong co-production motivation is the only significant determinant of customer functional quality.

### **3.6 CONCLUSION AND IMPLICATIONS**

This chapter expanded our knowledge on the successful management of co-production endeavours throughout the various stages in the customer relationship. As evidenced in Chapter 2, relationship initiation depends on the trade-off between customer's expected co-production benefits and costs. The present chapter, in turn, reveals that relationship continuance requires a satisfying co-production experience through the provision of high quality. Therefore, the current chapter introduced an extensive co-production quality typology consisting of: customer, employee and firm technical as well as functional quality. In addition, this chapter advanced the proactive management of three socialization indicators – role clarity, self-efficacy and motivation – to effectively shape customers' quality contributions. Practically, the findings help firms turn first-time customers into regular users, as well as identify approaches to leverage customer quality. This way, they aid firms in the development of long-term successful co-production options.

#### **3.6.1 Theoretical implications**

While actively involving customers in the production of the core offering affects outcomes and evaluations, exactly how co-production influences evaluative judgments remained unclear. Building on perceived quality theory, we argued that the quality of the contributions of the different partners in production is what matters. This way, we complement extant theory in several ways.

First, we adapted and extended the quality conceptualization to the growing reality of co-production options by including customers' contributions in addition to those of the firm and its employees. Since traditional quality literature focuses solely on firm and employee inputs (e.g., Brady and Cronin, 2001; Dagger et al., 2007; Parasuraman et al., 1988), they do not embrace an essential characteristic of co-production, namely customers' production inputs. In contrast, customer participation and co-production studies centre on technical

customer contributions (e.g., Auh et al., 2007; Chan et al., 2010; Dong et al., 2014), thereby also neglecting crucial quality elements. We merge both perspectives and simultaneously analyze the quality provisions of all three actors. In addition to who participates in co-production, we investigate the ways in which these parties contribute by integrating Grönroos' (1995) technical-functional distinction with general quality frameworks. This way, we arrive at a comprehensive typology of co-production quality which provides a much richer picture of the effect of co-production on customers' evaluations and intentions.

Second, despite its foundation in an employee-assisted context, our co-production quality model is adaptable to a wide range of settings. It offers managers a general framework and strongly encourages them to reflect on the different parties involved as well as the ways in which these actors contribute to the co-production experience. For example, in the case of purchasing IKEA furniture there may be no employee assistance, rendering employee quality superfluous. However, the physical environment or servicescape (e.g., store layout, lighting and temperature) plays a role, requiring its inclusion in the co-production quality model.

Third, by distinguishing between outcome and process satisfaction as well as repurchase and future co-production intentions, a more elaborate understanding of the network of customer evaluations develops. While repurchase intent's role as a prominent indicator of customer loyalty is relatively well understood, customer intent to perform similar co-production tasks in the future is under researched. Nonetheless, this represents a salient customer behaviour as the number of co-production initiatives keeps growing (Wang et al., 2013; Xia & Suri, 2014). And indeed, our research results revealed a differential impact of process and outcome satisfaction on the different usage intentions. Customers' perceived outcome satisfaction influences their intentions to co-produce again, whereas their process satisfaction predicts continued use of the same firm option and of other, similar co-production formats. This is in line with Bateson's (1985) idea that propensity to co-produce might transfer from one co-production option to another.

Finally, this study extends co-production theory by deepening insight in the drivers of customer co-production performance. Since prior organizational and marketing literature emphasizes methods to cultivate firm and employee performance, this is an area lacking investigation (Ford & McColl-Kennedy, 2015; Halbesleben & Stoutner, 2013). Specifically, we proposed anticipatory socialization as a mechanism for managing customers' co-production contributions. Unlike the unidimensional approach of previous studies (e.g., Büttgen et al., 2012; Groth, 2005), we adopted a more detailed view and assessed the varying impact of three distinct socialization indicators on two customer quality inputs (i.e., technical and functional). Following the results, proactive socialization plays a key role in developing among customers the level of role clarity, self-efficacy and motivation needed for effective co-production contributions. This validates the perspective of co-producing customers as partial employees and confirms the applicability of human resource management models.

### **3.6.2 Managerial implications**

The current chapter offers managerial directives for enhancing customer satisfaction and loyalty, two prime indicators of business performance. Additionally, it proposes proactive socialization as an actionable organizational strategy to effectively shape customer quality, an essential but relatively difficult to control quality factor. This way, several guidelines for successfully managing co-production options emerge.

To build a loyal customer base, firms should focus on stimulating both outcome and process satisfaction. Providing a satisfying co-production process is key to retain customers and differentiate the firm's offering from competitors' initiatives. Nevertheless, firms should be wary of neglecting outcome satisfaction, as an adequate outcome likely forms a basic prerequisite for considering the firm's co-production option again. Further, customers' future co-production intent depends significantly on both outcome and process satisfaction. Though not immediately relevant, future co-production intentions may indirectly impact firm prosperity. With the proliferation of co-production options, general customer acceptance is capital as it increases the business

opportunities for co-production firms. Also, firms providing various co-production options (e.g., airlines offering online booking and self check-in) might benefit from heightened future co-production intent to “cross sell” their initiatives, as such attracting customers to other firm co-production options. Our research offers several actionable insights on how to promote customer satisfaction:

***Enhance outcome satisfaction***

Outcome satisfaction is driven by the technical quality inputs of the customer, the employee as well as the firm. Thus, what each party contributes to co-production is crucial for a satisfactory outcome. Customers and employees must exert sufficient effort, share required information, and possess the skills and knowledge to fulfil the co-production task. In addition, the firm is responsible for providing physical co-production inputs and tools of adequate quality.

***Improve process satisfaction***

Process satisfaction depends evenly on the functional performance of the firm and its employees. Hence, not what these two actors provide but how they contribute creates a satisfying co-production process. The firm has to ensure smooth procedures and efficient operational practices to support the co-production process. Additionally, in their interactions with customers, employees need to display responsive behaviours and a friendly attitude. Exhibiting these required actions demands emotional labour on the part of the employee (Hennig-Thurau, Groth, Paul, & Gremler, 2006). Following research on emotional labour, explicitly defining rules regarding proper conduct can regulate employees’ emotional labour and, in turn, foster their authentic display of the desired emotions and manners (Diefendorff, Croyle, & Gosserand, 2005). Task autonomy and support from supervisors and co-workers may also elicit favourable functional behaviour from employees (Grandey, 2000).

Hence, managers must understand and monitor not only the different actors that participate in co-production (i.e., customer, firm and employee) but also the distinct ways in which these contribute to the co-production experience (i.e., via technical and functional inputs). This helps firms in pinpointing areas that

demand management attention and action to enhance or maintain high co-production quality and satisfaction.

Knowing this, the next step in gaining a return on co-production investment is bringing these quality contributions under managerial control. Firm quality is directly controllable through stringent quality control systems and firms can exert control over employee inputs via careful recruitment and selection, extensive training, and adequate appraisal and compensation systems. In contrast, getting customers to effectively cooperate forms the real challenge. An actionable approach to leverage customers' quality resources and prevent them from failing in their co-production role is socializing them prior to the co-production task. This entails ensuring good role clarity, high self-efficacy and strong motivation. Firms can actively manage these malleable socialization indicators via organizational programmes and tactics (Groth, 2005; Guo et al., 2013). Building on extant research, we describe several specific techniques below.

***Enhance role clarity*** Firms must direct managerial actions at increasing role clarity, since this improves technical quality inputs of customers. A clearer role understanding can be accomplished through the provision of detailed information on the particular co-production option and the customer's role herein (Büttgen et al., 2012). This can be via an info session or the firm website, through brochures or in-store signs (Groth, 2005). Offering customers a realistic preview of the co-production task creates accurate expectations and further raises customers' comprehension of role requirements (Groth, 2005; Halbesleben & Buckley, 2004b; Rodie & Kleine, 2000).

***Heighten self-efficacy*** As self-efficacy is an especially strong driver of customers' technical contributions, firms should formulate strategies to enhance customers' beliefs in their co-production skills and ability. Firms can cultivate efficacy beliefs through enactive mastery, meaning learning through experience. This can be accomplished by providing customers the opportunity to try out the co-production task or parts of it (Ford & Dickson, 2012; Meuter et al., 2005). For instance, DIY firms can organize training sessions where



customers can practice some essential techniques. Furthermore, customer-friendly training and education via elaborate instruction manuals, video tutorials or detailed how-to guides foster self-efficacy (Wang et al., 2013; Yim et al., 2012). Additionally, competence beliefs are stimulated by positive verbal persuasion (e.g., You can do it!) from employees or via posters and signs (Ford & Dickson, 2012; Yim et al., 2012).

***Increase motivation*** Customers' co-production motivation predicts not only what they contribute but also how they behave in their interactions with the firm and, thus, also requires firms' attention. Firm can strengthen customer motivation by clearly stating the benefits of participation (e.g., reduced price and increased control) and explicitly communicating the gravity of customers' own contributions for co-producing a successful offering (Büttgen et al., 2012; Meuter et al., 2005).

In addition to cultivating these socialization characteristics among customers, firms can monitor customers and target them based on their readiness. They can opt to only select customers displaying adequate role clarity, self-efficacy and motivation or they can adapt their socialization program to the differing customer readiness levels (Dellande et al., 2004; Dong et al., 2015).

### **3.7 DIRECTIONS FOR FURTHER RESEARCH**

Though our study offers a deeper insight into the process of enhancing customer quality contributions, thereby improving co-production satisfaction and driving future usage, various interesting avenues for future research remain open.

First, since the sample was drawn from a single firm and included only one co-production option (i.e., installing heating, plumbing and/or ventilation), the present findings could be replicated in different co-production settings to enhance the generalizability of our theoretical framework.

Second, as we employed a cross-sectional survey design containing self-report measures, future studies could combine self-reports with measures of actual

performance and behaviour. To diminish the potential impact of common method bias in this study, we employed several procedural remedies: proximally separating predictor and criterion measures, basing construct measures on existing measurement scales, applying different scale formats (Likert and semantic differential) and different scale anchors (Strongly agree – Strongly disagree; Never – Always; Very dissatisfied – Very satisfied) (Podsakoff, Mackenzie, Lee, & Podsakoff, 2003). Further, we urged our respondents to answer as honestly and accurately as possible with the assurance that their responses are completely confidential.

Third, though perceived quality is recognized as a prime determinant of customer satisfaction, customer perceived value may also be important in predicting customer satisfaction. Specifically, value could play the role of partial mediator between co-production quality and satisfaction (Chan et al., 2010; Choi et al., 2004; Cronin et al., 2000). Consequently, further research can incorporate perceived co-production value in this study's conceptual model in order to get a grasp on the bigger picture of how co-production quality affects customer evaluations.

Moreover, in this study we investigated customer contributions that are required for a successful co-production outcome (Yi & Gong, 2013). However, customers can also display other, discretionary behaviours that are not directly required for effective co-production but are nonetheless valuable to the firm (Groth, 2005). They can, for example, recommend the firm or provide feedback and suggestions that help the firm improve its co-production initiative. Studies on how firms can manage these so called extra-role behaviours present another interesting road for future research.

In addition, given the centrality of customer contributions in co-production, further research on how to effectively manage customers' co-production behaviour would be valuable. As our findings confirm the suitability of organizational theories for co-production research, other employee theories represent a potentially fruitful area of future study. Since socialization activities are mainly directed at novel customers and occur at the start of the co-

production process, it might be worthwhile to further examine how firms can shape customer performance during co-production. For instance, next to being affected by individual characteristics (e.g., role clarity, self-efficacy and motivation), customer contributions may be impacted by institutional factors (Ennew & Binks, 1999).

Finally, future studies might conduct longitudinal studies as the relative importance of quality dimensions might shift with time. For instance, employee support might become less relevant as customers gain experience (Collier & Sherrell, 2010). Or the salience of technical and functional quality contributions might alter as customers get more familiar with the co-production option.

To conclude, this research offers an actionable process model for firms seeking to heighten co-production quality, improve customer satisfaction and ultimately instigate continued use. Further, this study recommends socialization as an effective way to manage uncertain customer quality contributions. As the number of co-production options is only expected to increase, a clearer insight into the drivers of effective co-production is of strategic value to firms.

## 3.8 APPENDICES

### 3.8.1 Appendix A: Measurement model evaluation

#### REFLECTIVE CONSTRUCTS

**Table A:** Loadings, unidimensionality, composite reliability and AVE

Constructs and indicators	Loadings
<b>Role clarity</b>	
When I started installing, I knew clearly	
... what I as a customer needed to do for the FIRM's DIY concept.	.92***
... what was expected of me when choosing the DIY concept.	.89***
... what I was obliged to do when choosing the DIY concept.	.88***
... what my role was as a customer of FIRM when choosing the DIY concept.	.87***
$\lambda_1 = 3.19; \lambda_2 = .37; \rho_c = .94; AVE = .80$	
<b>Self-efficacy</b>	
When I started installing,	
... I felt fully capable to place the installation(s).	.92***
... I was confident in my capabilities to place the installation(s).	.96***
... I believed that placing the installation(s) is well within the scope of my abilities.	.94***
... I felt qualified to place the installation(s).	.93***
... I was convinced that I would be able to successfully place the installation(s).	.92***
$\lambda_1 = 4.34; \lambda_2 = .29; \rho_c = .97; AVE = .87$	
<b>Motivation</b>	
When I started installing, I was really motivated to	
... place the installation(s) myself.	.70***
... successfully place the installation(s).	.91***
... place the installation(s) flawlessly.	.87***
... finish the installation(s) in detail.	.88***
... execute the placing of the installation(s) to the best of my ability.	.86***
$\lambda_1 = 3.60; \lambda_2 = .68; \rho_c = .93; AVE = .72$	
<b>Customer effort</b>	
I exerted a lot of energy to place my installation(s).	.86***
I spent much time on placing my installation(s).	.91***
I worked very hard to place my installation(s).	.93***
I made a lot of effort in placing my installation(s).	.95***
$\lambda_1 = 3.33; \lambda_2 = .35; \rho_c = .95; AVE = .83$	
<b>Customer expertise</b>	
I was typically able to find an adequate solution.	.89***
I had the expertise that is needed to understand the information provided by the employees.	.81***
I was very well organized.	.81***
I hardly made mistakes when placing the installation(s).	.81***
$\lambda_1 = 2.76; \lambda_2 = .53; \rho_c = .90; AVE = .69$	
<b>Customer information sharing</b>	
I clearly explained FIRM what I wanted them to do.	.90***
I gave FIRM the proper information.	.94***
I provided FIRM the necessary information to perform their duties.	.93***
I answered all the FIRM's work-related questions.	.87***
$\lambda_1 = 3.31; \lambda_2 = .33; \rho_c = .95; AVE = .83$	

<b>Customer functional quality</b>	
I was polite and friendly to the FIRM's employees.	.72***
I responded promptly to requests for information.	.82***
I was always fair to the FIRM's employees.	.90***
I was open to the advice of the FIRM's employees.	.89***
I treated the FIRM's employees with respect.	.91***
$\lambda_1 = 3.60; \lambda_2 = .61; \rho_c = .93; AVE = .72$	
<b>Employee effort</b>	
The FIRM's employees	
... exert a lot of effort for your project.	.95***
... spent much time on your project.	.96***
... work very hard.	.96***
... make a lot of effort to help you.	.91***
$\lambda_1 = 3.57; \lambda_2 = .26; \rho_c = .97; AVE = .89$	
<b>Employee expertise</b>	
The FIRM's employees	
... are typically able to find an adequate solution.	.86***
... offer solutions that are very well thought through.	.91***
... have the necessary expertise.	.89***
... are very well organized.	.84***
... know the FIRM's product range very well.	.86***
... are typically very well informed.	.90***
... are very knowledgeable.	.92***
... hardly make mistakes.	.87***
... know about new developments (e.g., new products and new technologies).	.73***
$\lambda_1 = 6.76; \lambda_2 = .61; \rho_c = .96; AVE = .75$	
<b>Employee information sharing</b>	
The FIRM's employees	
... clearly explain what they want you to do.	.93***
... give you the proper information.	.94***
... provide you the necessary information to perform your duties.	.92***
... answer all your work-related questions.	.84***
$\lambda_1 = 3.29; \lambda_2 = .39; \rho_c = .95; AVE = .82$	
<b>Employee functional quality</b>	
The FIRM's employees	
... are polite and friendly.	.73***
... respond promptly to your requests.	.81***
... are dependable.	.90***
... are always willing to help you.	.92***
... give you individual attention.	.91***
... have your best interests at heart.	.88***
... are sympathetic and reassuring, when you have a problem.	.86***
... are flexible when dealing with questions and problems.	.90***
... are always easy to reach (when you have a problem or a question).	.80***
$\lambda_1 = 6.62; \lambda_2 = .66; \rho_c = .96; AVE = .74$	
<b>Outcome satisfaction</b>	
How satisfied are you with the finished installation?	
<b>Process satisfaction</b>	
How satisfied are you with the DIY process?	
<b>Firm repurchase intent</b>	
Suppose that in the future you need to place this type of installation again, would you choose to do it with FIRM?	
Very unlikely – Very likely	.99***
Definitely not – Definitely yes	.99***
$\lambda_1 = 1.97; \lambda_2 = .03; \rho_c = .99; AVE = .99$	

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**Intent to co-produce again**

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Suppose that in the future you need to place this type of installation again, would you do it yourself?

Very unlikely – Very likely

.99\*\*\*

Definitely not – Definitely yes

.99\*\*\*

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$\lambda_1 = 1.95$ ;  $\lambda_2 = .05$ ;  $\rho_c = .99$ ; AVE = .98

$\rho_c$  = composite reliability

\* $p < .10$ ; \*\* $p < .05$ ; \*\*\* $p < .01$

**Table B:** Discriminant validity – 1<sup>st</sup> stage HTMT criterion

	<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>	<b>5</b>	<b>6</b>
1. Customer effort						
2. Customer expertise	.19					
3. Customer info sharing	.34	.57				
4. Employee effort	.29	.22	.17			
5. Employee expertise	.15	.27	.12	.84		
6. Employee info sharing	.31	.35	.19	.84	.75	

**Table C:** Discriminant validity – 2nd stage HTMT criterion

	<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>	<b>5</b>	<b>6</b>	<b>7</b>	<b>8</b>	<b>9</b>
1. CFQ									
2. EFQ	.28								
3. Intent to co-produce again	.29	.24							
4. Motivation	.46	.15	.35						
5. Outcome satisfaction	.29	.38	.36	.41					
6. Process satisfaction	.20	.62	.43	.29	.40				
7. Repurchase intent	.24	.68	.38	.20	.35	.70			
8. Role clarity	.26	.44	.38	.37	.25	.57	.48		
9. Self-efficacy	.25	.23	.37	.52	.35	.31	.23	.46	

## FORMATIVE CONSTRUCTS

**Table D:** Variance inflation factor (VIF)

	<b>VIF</b>		<b>VIF</b>
LV Customer effort	1.11	Firm technical quality_1	1.55
LV Customer expertise	1.34	Firm technical quality_2	1.71
LV Customer info sharing	1.45	Firm technical quality_3	1.23
LV Employee effort	3.87	Firm functional quality_1	1.30
LV Employee expertise	2.92	Firm functional quality_2	1.30
LV Employee info sharing	2.75		

**Table E:** Indicator loadings

	<b>Loading</b>
<b>Firm technical quality</b>	
The quality of the products and materials is ...	.95***
The quality of the tools that you can lend is ...	.82***
The quality of the installation plans and schemas is ...	.38***
<b>Firm functional quality</b>	
The quality of the ordering and delivery process is ...	.96***
The quality of invoicing is ...	.70***
<b>Customer technical quality</b>	
LV Customer effort	.38**
LV Customer expertise	.95***
LV Customer information sharing	.70***
<b>Employee technical quality</b>	
LV Employee effort	.95***
LV Employee expertise	.95***
LV Employee information sharing	.75***

\* $p < .10$ ; \*\* $p < .05$ ; \*\*\* $p < .01$

**Table F:** Discriminant validity for formative constructs

	<b>LVC</b>	<b>LVC - 2SE</b>	<b>LVC + 2SE</b>		<b>LVC</b>	<b>LVC - 2SE</b>	<b>LVC + 2SE</b>
CTQ - Self-efficacy	.65	.52	.77	FFQ - Self-efficacy	.27	.11	.43
CTQ - CFQ	.46	.31	.60	FFQ - CFQ	.19	.03	.35
CTQ - EFQ	.30	.15	.46	FFQ - CTQ	.35	.20	.51
CTQ - ETQ	.25	.09	.41	FFQ - EFQ	.56	.43	.70
CTQ - Motivation	.56	.42	.69	FFQ - ETQ	.56	.42	.69
CTQ - FFQ	.35	.20	.51	FFQ - Motivation	.09	-.08	.25
CTQ - FTQ	.35	.20	.51	FFQ - FTQ	.36	.21	.51
CTQ - Outcome satisfaction	.54	.40	.68	FFQ - Outcome satisfaction	.32	.16	.48
CTQ - Process satisfaction	.39	.24	.54	FFQ - Process satisfaction	.51	.37	.66
CTQ - Intent to co-produce again	.43	.28	.58	FFQ - Intent to co-produce again	.13	-.03	.30
CTQ - Repurchase intent	.24	.08	.40	FFQ - Repurchase intent	.63	.51	.76
CTQ - Role clarity	.42	.28	.57	FFQ - Role clarity	.38	.23	.53
ETQ - Self-efficacy	.23	.07	.39	FTQ - Self-efficacy	.25	.09	.41
ETQ - CFQ	.20	.04	.36	FTQ - CFQ	.37	.22	.52
ETQ - CTQ	.25	.09	.41	FTQ - CTQ	.35	.20	.51
ETQ - EFQ	.82	.73	.92	FTQ - EFQ	.36	.20	.51
ETQ - Motivation	.16	-.01	.32	FTQ - ETQ	.38	.22	.53
ETQ - FFQ	.56	.42	.69	FTQ - Motivation	.27	.11	.43
ETQ - FTQ	.38	.22	.53	FTQ - FFQ	.36	.21	.51
ETQ - Outcome satisfaction	.40	.25	.55	FTQ - Outcome satisfaction	.48	.34	.63
ETQ - Process satisfaction	.59	.46	.72	FTQ - Process satisfaction	.32	.16	.48
ETQ - Intent to co-produce again	.26	.10	.42	FTQ - Intent to co-produce again	.27	.11	.43
ETQ - Repurchase intent	.76	.65	.87	FTQ - Repurchase intent	.40	.25	.55
ETQ - Role clarity	.45	.30	.59	FTQ - Role clarity	.33	.17	.48

$$SE = \frac{\sqrt{1-LVC^2}}{n-2}$$

n = Sample size = 149



### 3.8.2 Appendix B: Relative importance and total effect estimates

**Table A:** Relative importance of co-production quality dimensions

	Difference of path coefficients	Confidence interval <sup>a</sup>	Different?
CTQ - ETQ	.19	[-.03;.40]	No
CTQ - FTQ	.13	[-.19;.47]	No
FTQ - ETQ	.06	[-.22;.30]	No
EFQ - FFQ	.20	[-.09;.47]	No
EFQ - CFQ	.43	[.08;.64]***	Yes
FFQ - CFQ	.23	[.02;.37]*	Yes

<sup>a</sup> Percentile bootstrap confidence intervals based on 5000 bootstrap samples.

\* CI 90%; \*\* CI 95%; \*\*\* CI 99%

**Table B:** Total effect estimates of co-production quality dimensions

	CTQ	CFQ	Outcome satisf.	Process satisf.	Firm repurchase intent	Intent to co-produce again
Role clarity	.13**	.10	.05**	.00	.01	.01*
Self-efficacy	.45***		.18***		.01	.04**
Motivation	.29***	.39***	.12***	.01	.01	.03**
CTQ			.41***		.03	.09**
CFQ				.02	.01	.01
ETQ			.22***		.02	.05**
EFQ				.45***	.29***	.15***
FTQ			.28***		.02	.06*
FFQ				.25***	.16***	.08**
Outcome satisfaction					.08	.22**
Process satisfaction					.64***	.33***

\*  $p < .10$ ; \*\*  $p < .05$ ; \*\*\*  $p < .01$

**Table C:** Relative importance of socialization indicators

	Difference of path coefficients	Confidence interval <sup>a</sup>	Different?
Self-efficacy - Motivation → CTQ	.16	[-.16;.42]	No
Self-efficacy - Role clarity → CTQ	.32	[.05;.54]**	Yes
Motivation - Role clarity → CTQ	.16	[-.05;.38]	No
Motivation - Role clarity → CFQ	.29	[.05;.47]*	Yes

<sup>a</sup> Percentile bootstrap confidence intervals based on 5000 bootstrap samples.

\* CI 90%; \*\* CI 95%; \*\*\* CI 99%



**CHAPTER 4**

**EFFECTIVELY MANAGING CUSTOMER PARTICIPATIVE BEHAVIOURS  
DURING CO-PRODUCTION: THE ROLE OF TASK DESIGN AND CUSTOMER  
WELLBEING**

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## **CHAPTER 4**

# **EFFECTIVELY MANAGING CUSTOMER PARTICIPATIVE BEHAVIOURS DURING CO-PRODUCTION: THE ROLE OF TASK DESIGN AND CUSTOMER WELLBEING**

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### **ABSTRACT**

Co-production has increased substantially over the years and is recognized as a source of competitive effectiveness. However, as customer behaviour drives co-production quality, satisfaction and eventually the firm's financial performance, eliciting high-quality participation is a critical factor for success. Unfortunately, research on how firms can effectively manage customer co-production performance is scant. Therefore, building on the Job Demands-Resources model, this study examines the mechanisms via which co-production task design influences customer participative behaviours. Specifically, this chapter investigates how co-production task demands (i.e., quantitative and qualitative workload) and resources (i.e., perceived organizational support) affect customers' wellbeing (i.e., experienced strain and task engagement) and, in turn, their participative behaviours (i.e., in-role and extra-role). According to the results, demands increase customers' experienced strain, while resources lower it. Subsequently, strain affects customers' word-of-mouth actions. On the other hand, customers' task engagement affects in-role behaviour and the provision of feedback to the firm. Interestingly, organizational support displays no significant impact on customers' task engagement, while quantitative workload exerts a negative and qualitative workload a positive influence. Quantitative workload therefore is a hindrance demand whereas qualitative workload represents a challenge demand. Further, instead of buffering the effect of quantitative workload on strain, organizational support enhances its impact. Overall, the findings help firms design successful co-production initiatives and effectively manage their customers' performance, a salient source of strategic advantage.

## 4.1 INTRODUCTION

The recent proliferation of co-production options (e.g., self-scanning, self check-in and DIY kits) and the substantial co-production investments by firms warrant research on the drivers of successful co-production. Understanding these drivers is a precondition for realizing the economic advantages of co-production and gaining a satisfactory return on investment.

As co-producers, customers actively participate in the firm's production process and perform certain production tasks previously executed by firm employees (Groth, 2005; Troye & Supphellen, 2012). Consider, for example, customers assembling furniture themselves or scanning their groceries. In their role as co-producer, the way customers perform and behave not only affects their own co-production evaluations but, eventually, also the organization's bottom line (Bettencourt et al., 2002; Yoo et al., 2012). As a result, fostering effective participative behaviours is imperative for successful co-production from a customer as well as a firm perspective (Halbesleben & Stoutner, 2013; Lengnick-Hall, 1996). It may even form the basis for a firm's long-term competitive advantage, since high-performing customers represent unique and difficult to copy resources (Tax et al., 2006). Additionally, customers regularly contribute inadequately to co-production, thereby severely impeding the value created for both the customer and the firm (Greer, 2015). Specifically, not displaying the necessary behaviours reduces customers' chances of a desired outcome and generates additional business costs (Gallan et al., 2013; Halbesleben & Buckley, 2004b). For instance, if a customer does not make the effort to sufficiently grease the couplings when installing plumbing, the chance of leakages greatly increases.

Two customer participative behaviours that firms should proactively manage are in-role and extra-role behaviour (Yi, Natarajan, & Gong, 2011). In-role behaviour includes actions essential for an effective outcome, whereas extra-role behaviour refers to discretionary conduct that is not explicitly required for co-production completion but is nonetheless valuable to the firm (e.g., positive word-of-mouth) (Bove, Pervan, Beatty, & Shiu, 2009). Despite their relevance

for profitable co-production (Groth, 2005), knowledge on the actionable antecedents of these strategic customer participative behaviours is scant. Previous studies have assessed customer role readiness *prior* to co-production (e.g., Dellande et al., 2004) or focused on the determinants of in-role behaviour (e.g., Büttgen et al., 2012). However, a dearth of empirical research exists on how to ensure both adequate in-role and extra-role performance *during* the co-production experience.

One promising avenue to shape customers' behaviour and prevent them from failing is by redesigning customers' co-production activities (Tax et al., 2006). Understanding how to effectively design co-production tasks is particularly appealing as it falls under direct firm control and, thus, can be actively managed. Therefore, the current study investigates the influence of co-production task design on customer participative behaviours. In light of co-producing customers as partial employees of the firm, job design theories from organizational literature might be extremely suited to address this theoretically and managerially relevant issue (Bowers & Martin, 2007; Halbesleben & Buckley, 2004b). Specifically, we draw on the Job Demands-Resources (J D-R) theory (Demerouti, Bakker, Nachreiner, & Schaufeli, 2001) to explore whether and how co-production task design affects customer behaviour. J D-R theory offers an overarching framework that clarifies the effect of task characteristics (i.e., demands and resources) on an individual's wellbeing and, in turn, his/her conduct and performance (Bakker & Demerouti, 2007).

By building on the J D-R model to manage customer behaviour, our research intends to make the following contributions to marketing literature and practice. First, to our best knowledge, this study represents a first empirical endeavour to examine how design tactics can shape customer participative behaviours during the co-production experience. Despite awareness of the necessity of effective customer performance for co-production success and the extensive implementation of co-production initiatives, empirical research on this topic is lacking. Second, this study provides new insights into the underexplored effects of co-production on customer wellbeing (i.e., feelings of strain and engagement). Thereby it answers the call for additional research on the

psychological consequences of co-production for customers (Bendapudi & Leone, 2003). Prior investigations considered employees' psychological responses to customer participation (e.g., Chan et al., 2010; Hsieh and Yen, 2005) but neglected its implications for customers' personal welfare. This is striking as co-production entails a novel role for the customer, with new behaviours and added responsibilities and, thus, likely affects customers' mental state (Meuter et al., 2005; Wang et al., 2013).

Third, our research provides a balanced perspective of the drivers of customer participative behaviour, as the J D-R framework covers the distinct effects of positive and negative task characteristics as well as positive and negative psychological processes. This is congruent with the findings of Chapter 2, underscoring that both positive and negative value considerations affect customers' co-production decision. Fourth, in terms of practical relevance, by offering truly actionable strategies, the findings aid managers in the design of effective co-production activities that foster customer wellbeing and elicit desired participative behaviours. As such, they help improve the mutual gains of co-production initiatives for the customer and the firm.

The rest of this paper is structured as follows. First, we discuss the Job Demands-Resources model. Next, we introduce the Co-production Demands-Resources framework and develop the study hypotheses. The research design is presented subsequently, followed by a description and discussion of the study results. Finally, we provide an overview of the theoretical and managerial implications as well as present some avenues for further research.

## **4.2 THE JOB DEMANDS-RESOURCES MODEL**

Due to its adaptable character, the Job Demands-Resources model is an excellent instrument for human resource management (Bakker & Demerouti, 2007). The J D-R framework assumes an interplay of job characteristics to affect employees' behaviour and job performance, via their impact on employee wellbeing (see Figure 13) (Bakker & Demerouti, 2007; Schaufeli & Taris, 2014). These job characteristics can be classified in two general categories, resources



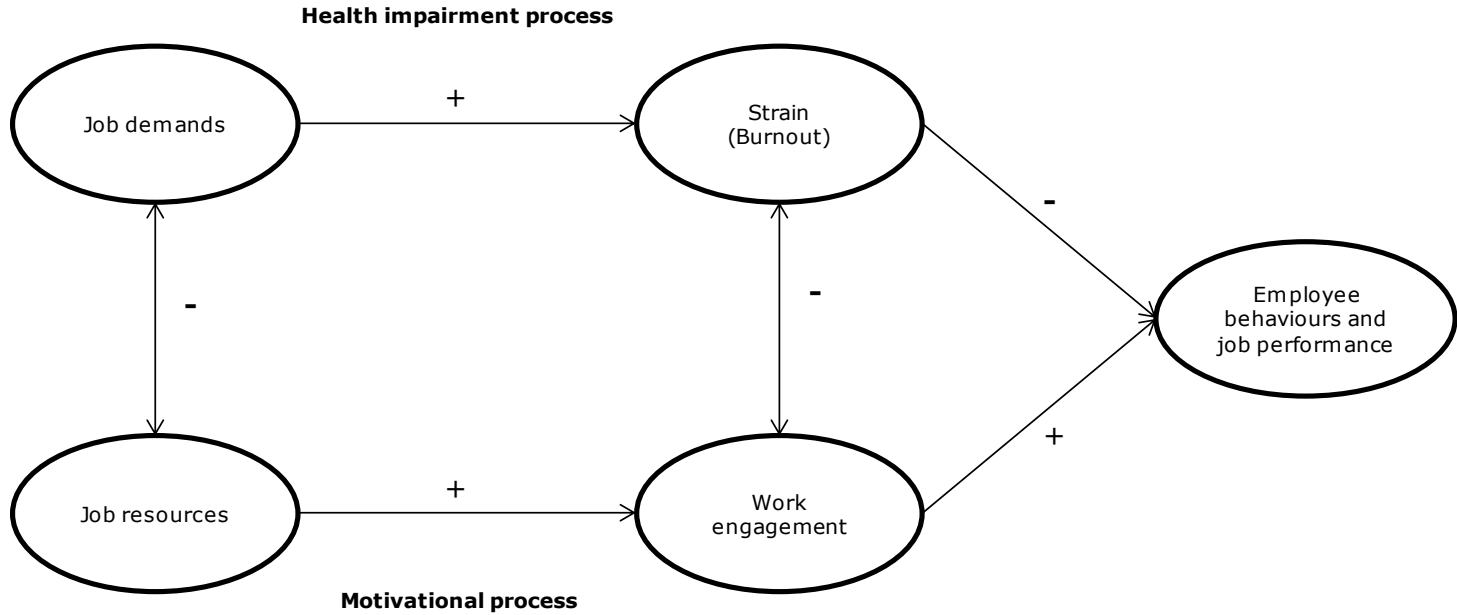
and demands, that differentially influence job outcomes (Demerouti et al., 2001).

Job resources depict the positive characteristics of a job or task. They encompass the physical, psychological, social, or organizational job elements that help employees reach their work objectives, reduce the negative effect of job demands or advance employees' personal development (Demerouti et al., 2001). Hence, resources possess an intrinsic and extrinsic motivational potential. First, they are instrumental by aiding individuals in achieving their objectives (Schaufeli & Taris, 2014). Additionally, they are appreciated for their own sake as they foster inner growth and learning. Examples are supervisor support, performance feedback, and autonomy. Job demands, in contrast, represent negative job characteristics. They comprise the physical, psychological, social, or organizational work aspects that require continual effort from the employee and, hence, are related to specific psychological and physiological costs (Demerouti et al., 2001). Work pressure, physical demands and task complexity are instances of job demands.

Similarly, employee wellbeing includes a positive and negative component. Work engagement embodies an employee's positive level of investment in the job, marked by vigour, dedication and absorption (Schaufeli & Bakker, 2004; Zablah, Chonko, Bettencourt, Allen, & Haas, 2012). Strain, on the other hand, describes the negative psychological reactions to a (perceived) stressful work environment (e.g., nervousness, agitation and tension) (Hart & Cooper, 2001).

**Figure 13:** The basic Job Demands-Resources model

(based on Bakker and Demerouti (2007) and Schaufeli and Taris (2014))



According to the J D-R model, two different, but linked psychological processes are primarily responsible for the effect of job demands and resources on employee wellbeing and performance (Schaufeli & Taris, 2014). According to the health impairment process, high demands call for sustained effort, which drains employees mentally and/or physically, thereby generating psychological strain and ultimately harming employees' task performance and health. As such, this process proposes a job demands – strain – work performance relationship. On the other hand, the motivational process indicates that job resources create a favourable psychological state by increasing employees' work engagement which, subsequently, fosters organizational performance. This way it puts forward a job resources – engagement – work performance linkage. Both psychological processes have received strong and consistent empirical support in organizational behaviour and health research (see for example Bakker and Demerouti, 2007; Schaufeli, Bakker and Van Rhenen, 2009; Schaufeli and Bakker, 2004; Schaufeli and Taris, 2014).

Though the J D-R model is originally developed in organizational research, it may be well-suited for managing customers in co-production. As co-producing customers perform some of the production work traditionally carried out by firm employees, they are considered partial employees of the organization and employee management theories form promising tools to direct their behaviour (Bettencourt, 1997; Groth, 2005). More specifically, the J D-R model forms the theoretical foundation of the current study for the following three reasons. First, J D-R theory presents a general framework for thinking about the impact of negative as well as positive task characteristics (i.e., demands and resources) on behaviour (Schaufeli & Taris, 2014). According to previous co-production literature (Etgar, 2008) and as evidenced by the findings of Chapter 2, including both positive and negative aspects of co-production is essential when investigating customer intentions and behaviours.

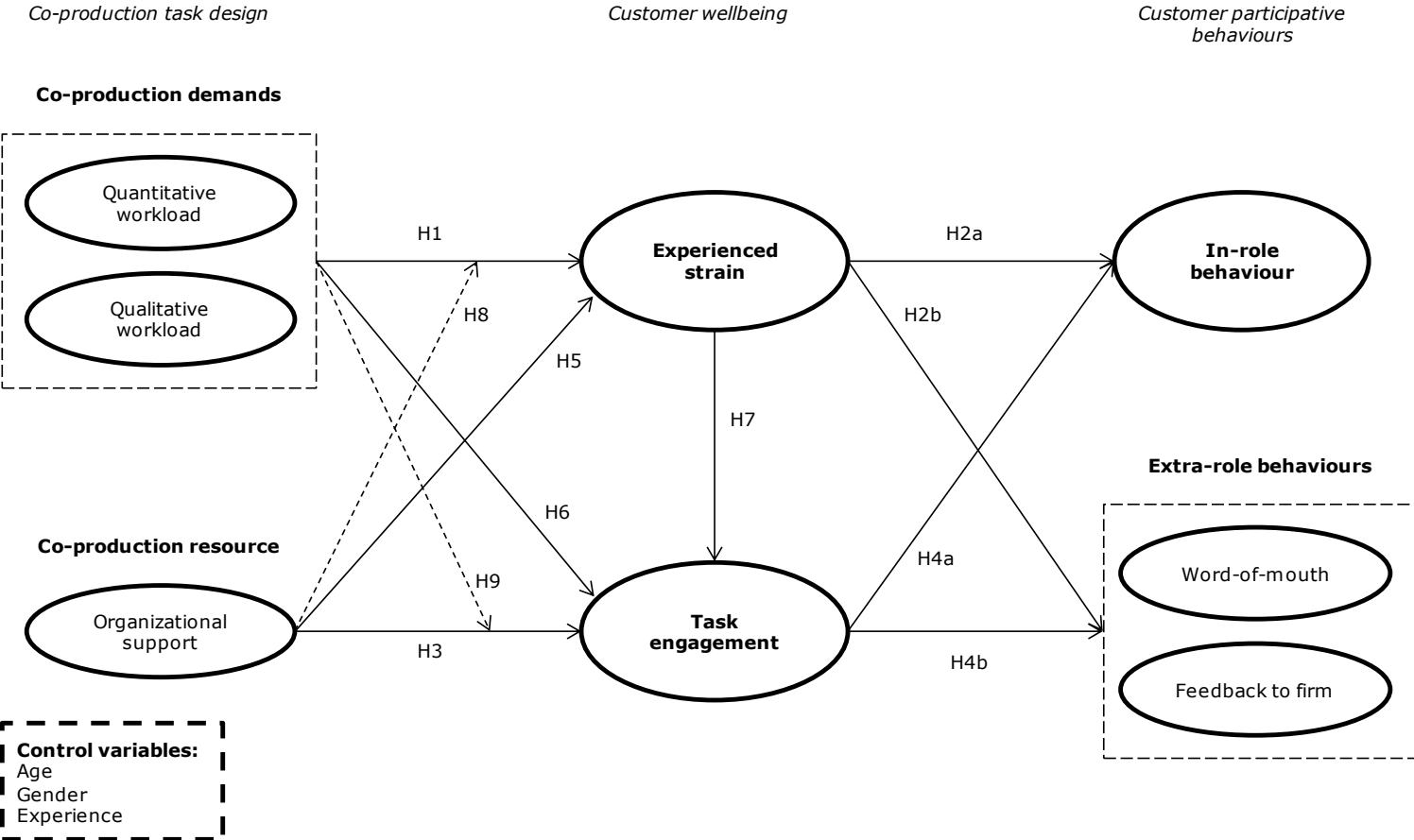
Second, by incorporating wellbeing as an intermediate construct, J D-R theory explains how task characteristics influence an individual's behaviour, as such shedding light on the underlying (psychological) process. So far, the effects of co-production on customer wellbeing received scant attention, despite the

transformative customer research movement actively stimulating studies on this topic (Anderson & Ostrom, 2015). Third, as it does not focus on a particular set of task characteristics or outcomes, the J D-R model can be tailored to a wide variety of settings and lends itself perfectly for the examination of customer behaviour in a co-production context (Bakker & Demerouti, 2007). Besides enhancing the practical applicability of our study, the J D-R model's general character aids firms in conducting a formal Return on Marketing analysis of their investments in co-production task design (cf. Rust et al., 2004).

### **4.3 THE CO-PRODUCTION DEMANDS-RESOURCES MODEL**

Applied to a co-production context, the J D-R model specifies how co-production task demands and resources influence customers' wellbeing and, subsequently, their participative behaviours (see Figure 14). Specifically, we put forward quantitative and qualitative workload as co-production demands that increase the amount of strain experienced by customers as well as reduce their task engagement, while organizational support is a co-production resource that strengthens customers' task engagement and attenuates their experienced stress. Further, the interaction between co-production demands and resources affects the wellbeing of the customer. In addition, we propose a negative influence of perceived strain on customers' engagement and their in-role and extra-role behaviour, in contrast to a positive effect of task engagement on both in-role and extra-role behaviour. A more detailed development of the Co-production Demands-Resources (C D-R) model constructs is given below, while the rationale for the proposed model relationships is explained in the next section.

**Figure 14:** The Co-production Demands-Resources model



### **4.3.1 Customer participative behaviours**

Similar to the main elements of employee behaviour and job performance (Williams & Anderson, 1991), we discern two central dimensions of customer participative performance in co-production: in-role and extra-role behaviour (Groth, 2005; Yi et al., 2011). As these two behaviours prominently affect co-production success and exhibit different networks of consequences, distinguishing between them is crucial (Groth, 2005; Yi & Gong, 2013).

In-role behaviour refers to the actions and conducts that are expected of the customer and that are essential for a successful co-production outcome (Bove et al., 2009). Effective co-production requires that customers observe and follow firm policies, fulfil their responsibilities and comply with employee directives (Yi & Gong, 2013). If customers, for instance, do not print their boarding pass at the airport self check-in or do not enter their address information when ordering online, effective co-production is not possible. This is confirmed by extant empirical research which links customer in-role performance to varied organizational performance measures, such as perceived service quality (Dong et al., 2015), customer satisfaction (Dellande et al., 2004), customer attitudinal loyalty (Auh et al., 2007), employee performance and satisfaction (Yi et al., 2011).

In contrast, extra-role behaviours are not necessary for successful co-production completion, yet support an effective organizational functioning (Groth, 2005). They involve discretionary, not explicitly required customer behaviours that are nonetheless beneficial to the firm (Yi et al., 2011). Customer extra-role performance mirrors employee organizational citizenship behaviour which has received extensive attention in organizational literature (Podsakoff, Whiting, Podsakoff, & Blume, 2009; Podsakoff, Mackenzie, Paine, & Bachrach, 2000). Previous empirical studies linked customer extra-role behaviours to valuable firm outcomes like customer value (Yi & Gong, 2013), reduced customer turnover (Revilla-Camacho, Vega-Vázquez, & Cossío-Silva, 2015), heightened firm sales (Eisingerich et al., 2014), employee commitment and performance (Yi et al., 2011). Relevant co-production extra-role behaviours include engaging in positive word-of-mouth (WOM) and providing feedback and suggestions to the firm

(Groth, 2005). Positive WOM stimulates firm performance by favourably affecting other customers' evaluations towards the firm while feedback enhances future customer experiences (Verleye et al., 2014).

#### **4.3.2 Customer wellbeing**

The strain customers experience during co-production reflects the negative side of customer wellbeing. Strain comprises the negative physiological and emotional responses (e.g., tension, frustration and anxiety) to actual or perceived stressful events in, and characteristics of a person's environment (Ganster & Schaubroeck, 1991; Hart & Cooper, 2001). A continued stressful condition can cause physical and mental health problems. In co-production, some researchers have suggested that participating in production can lead customers to experience feelings of stress, frustration and/or anxiety (Campbell et al., 2011; Collier & Sherrell, 2010; Curran et al., 2003).

Drawing on employee management literature, we define task engagement as a positive, fulfilling, task-related state of mind that is characterized by vigour, dedication and absorption (Bakker, 2011; Schaufeli & Bakker, 2004). Vigour pertains to feeling energetic while working, having mental resilience and being persistent in the face of difficulties. Dedication refers to a strong feeling of involvement and a sense of significance, enthusiasm and work pride. Absorption is characterized by deep concentration and being happily immersed in your work. This definition of engagement is in line with recent work in marketing, which views customer engagement as a psychological state and acknowledges its cognitive, emotional and behavioural dimensions (Brodie et al., 2011). Several studies in a customer services context posit a link between positive affective states and customer participative behaviours (e.g., Gallan et al., 2013; Verleye et al., 2014).

#### **4.3.3 Co-production demands and resources**

The specific demands and resources that play a role depend on the particular context at hand. Based on the nature of the co-production setting and consultation with the business manager of the specific firm under study, we

selected quantitative and qualitative workload as the co-production demands and perceived organizational support as the co-production task resource.

A clear distinction exists between the two demands (Xie, Schaubroeck, & Lam, 2008). Quantitative workload refers to the quantitative, demanding aspects of being pressed for time and having to work hard (Schaufeli & Bakker, 2004). Co-production literature consistently mentions effort and time as potential drawbacks of participating in production (e.g., Etgar, 2008). Qualitative workload is high when dealing with complex tasks that place strong requirements on concentration and create a high mental load. As the active participation in the production process implies new customer roles and responsibilities and often requires learning new skills, co-production tasks also demand substantial mental labour on the part of the customer (Etgar, 2008; Meuter et al., 2005).

The task resource for this study, perceived organizational support (POS), reflects the feeling that the firm values customers' contributions and is concerned about their wellbeing (Rhoades & Eisenberger, 2002). With high POS, customers participating in production believe that they can count on the firm's help when needed and that they can rely on the firm to act in a responsible and fair manner (Bettencourt, 1997). As a result, POS can motivate cooperative participative behaviours.

#### **4.4 HYPOTHESES DEVELOPMENT**

According to the J D-R model, two basic psychological processes - the health impairment process and the motivational process - underlie the development of task strain and engagement and, in turn, individual performance and behaviour (Bakker & Demerouti, 2007). Extensive empirical evidence supports the existence of these two processes (see Schaufeli & Taris, 2014).

##### **4.4.1 The health impairment process**

According to the health impairment process, employees experience strain because high job demands gradually deplete their psychological and physical



energy, which then results in inferior work performance (Bakker & Demerouti, 2007; Schaufeli & Taris, 2014). This reasoning is in line with the model of compensatory control (Hockey, 1997). Following Hockey, employees must balance between sustaining target performance and the effort required to attain this performance level (Schaufeli et al., 2009). Then, increased work demands are associated with several physiological and psychological costs (e.g., fatigue and mental distress), since extra effort is required to protect performance (Schaufeli & Taris, 2014). Insufficient recovery from this additional effort exertion leads to an exhaustion of employees' available energy and causes psychological strain.

Subsequently, this experienced psychological distress further drains an individual's energy levels, who then lacks the necessary cognitive, emotional and physical energy to carry out his role obligations properly (Zablah et al., 2012). Eventually, this undermines a person's primary task performance (Bakker, Demerouti, & Verbeke, 2004). Therefore, we expect task demands, via perceived strain, to affect an individual's in-role behaviours. In addition, we anticipate a negative relationship between experienced strain and customer extra-role behaviours. As psychological distress drains energy, a strained individual likely lacks the necessary energy to perform additional, discretionary actions (Nahrgang, Morgeson, & Hofmann, 2011). For example, in their review of burnout literature, Halbesleben and Buckley (2004a) report that burnout diminishes an employee's extra-role performance.

A similar health-impairment process can be expected to exist in a co-production context. As co-producers, customers are exposed to a variety of new task demands and responsibilities (Meuter et al., 2005). Since meeting these demands requires substantial effort and time investments, co-production can create cognitive costs (i.e., strain) and subsequently lead to an impaired performance (Bendapudi & Leone, 2003; Curran et al., 2003). Further, co-production labour only leads to enhanced evaluations when the task is successfully accomplished (Norton, Mochon, & Ariely, 2012). Failing to finish a task has an adverse psychological impact. Hence, as high quantitative and

qualitative workload reduce chances of effective task completion, these co-production demands likely induce psychological distress.

Based on the above reasoning, we hypothesize the following:

H1: a) Quantitative workload and b) qualitative workload positively affect customers' experienced strain

H2: Customers' experienced strain negatively affects customers' performed a) in-role behaviour and b) extra-role behaviours.

#### **4.4.2 The motivational process**

In line with job characteristics theory (Hackman & Oldham, 1980), the J D-R model's motivational process posits that job resources possess a motivational power by which they enhance task engagement and, in turn, organizational performance (Bakker & Demerouti, 2007). Jobs in which employees can call on many resources are stimulating and lead, through so-called critical psychological states, to enhanced performance (Salanova & Schaufeli, 2008). The motivational force of resources is intrinsic or extrinsic in nature. First, resources encourage personal growth, learning and development (Schaufeli & Bakker, 2004). This way, they satisfy basic human needs for autonomy, competence and/or relatedness which, according to self-determination theory (Deci & Ryan, 1985), fosters intrinsic motivation and boosts wellbeing. Second, next to being valuable in their own right, resources represent means to an end. High-resource task environments increase chances of goal attainment, thereby extrinsically motivating individuals and raising their engagement (Schaufeli & Taris, 2014). Thus, be it intrinsically or extrinsically, task resources encourage work engagement (Salanova & Schaufeli, 2008).

In turn, engaged individuals are dedicated to their work and committed to give it their best (Bakker, 2011). Also, engagement entails the intense and persistent investment of the full self (i.e., mentally, affectively and physically) into role performance (Rich, Lepine, & Crawford, 2010). When employees are engaged, they are immersed in their work and more focused on their responsibilities and goal attainment (Schaufeli, Taris, & Bakker, 2006). Consequently, they should demonstrate an enhanced in-role performance. Additionally, work engagement,

characterized by high levels of energy, dedication, work enthusiasm and engrossment is expected to affect extra-role performance (Rich et al., 2010; Schaufeli, Taris, et al., 2006). Engaged workers show a willingness to go the extra mile and move beyond mere goal accomplishment (Bakker, 2011). This is in accord with the idea of social exchange theory (Blau, 1964). In return for a challenging and enriched job, employees feel compelled to respond in kind and repay the organization by increasing their engagement and extra-role performance (Saks, 2006). Put differently, following the norm of reciprocity, engaged employees feel obliged to improve task performance and demonstrate beneficial discretionary behaviours, in return for the resources provided by the firm (Bakker et al., 2004; Neves & Eisenberger, 2012). Hence, work engagement is expected to enhance in-role and extra-role performance (cf. Bakker's (2011) work engagement model).

A salient task resource is perceived organizational support, since it motivates individuals intrinsically by adding to their feeling of belonging and competence as well as extrinsically by signalling that organizational assistance is available when required for successful task fulfilment (Rhoades & Eisenberger, 2002). Saks (2006) links POS directly to increased engagement on the part of the employee. This relationship can be explained by the fact that in a supportive organization employees feel psychologically safe and thus are more inclined to fully engage themselves in their work (Rich et al., 2010). A similar link between POS and engagement is expected for customers involved in co-production. Lusch, Brown and Brunswick (1992) discuss how customers' resource capacities influence their willingness to engage in co-production tasks. Bettencourt (1997) indicates that when customers perceive a high level of support, they are more inclined to establish a social exchange relationship with the firm and, thus, more willing to cooperate in service production and delivery. Verleye et al. (2014) further argue that perceived organizational support increases customers' positive feelings towards the firm as it stimulates an improved customer-firm relationship.

Further, in co-production, customer exchanges with the firm during the production process can be classified as social in nature and, as such, reciprocal

relationships develop (Groth, 2005; Yi et al., 2011). The principle of reciprocity, thus, can also be found in the customer-firm relationship. Customer affect drives this social exchange, such that higher positive affect (e.g., engagement) towards a firm promotes customer reciprocity in the form of in-role and extra-role behaviours (Verleye et al., 2014). For instance, Gallan et al. (2013) validated customer positive affect as an antecedent of required customer participative behaviours. Additionally, Bettencourt (1997) demonstrates the existence of a positive relationship between customer commitment and promoting of a firm as well as giving feedback and suggestions for improvement. Further, in an Internet service context, Groth (2005) showed that customer satisfaction enhances the display of voluntary extra-role behaviours. Finally, Eisingerich et al. (2014) noted that satisfied customers are more likely to engage in word-of-mouth and give constructive feedback and suggestions to the firm.

Therefore, we hypothesize that:

H3: Organizational support positively affects customers' task engagement

H4: Customers' task engagement positively affects customers' performed a) in-role behaviour and b) extra-role behaviours.

#### **4.4.3 Health impairment and motivational process crosslinks**

Following previous research, the health impairment process and the motivational process are not independent but linked to each other and, therefore, should be studied jointly (Schaufeli & Taris, 2014). Schaufeli and Bakker (2004) also propose that resources and demands are related. Resources are viewed as instrumental in dealing with demands, whereas demands are job characteristics that draw on resources (Halbesleben & Buckley, 2004a). Therefore, it is important to investigate these crosslinks in more detail and include them in our hypotheses.

First, the influence of task resources on perceived strain should be taken into account. Resources are assumed to reduce the psychological and physiological costs following from task demands (Schaufeli et al., 2009). They replenish a

person's psychological and physical energy and hence protect him/her against experienced stress (Nahrgang et al., 2011). This is in line with the conservation of resources model (Hobfoll, 2001), which argues that threats to or loss of things someone values, such as resources, lead to stress and eventually burnout. An individual with restricted resources to counteract demands is more vulnerable to resource loss and thus builds up stress more quickly, while someone with access to more resources is better shielded from the stress of resource losses. Research in a variety of industries notes how task resources and, in particular a supportive environment, aid individuals in reducing psychological distress (e.g., Nahrgang et al., 2011; Schaufeli et al., 2009; Schaufeli and Bakker, 2004; Singh, 2000). Similarly, the stress customers experience while co-producing might be alleviated if they believe assistance is available when needed and they feel the firm cares about their needs. Bettencourt (1997), for instance, points towards the uncertainty reducing character of POS, implying that perceived organizational support can reduce customers' experienced strain. In contrast, customers perceiving no or little support to be available, can feel a lack of control and become frustrated or anxious (Collier & Sherrell, 2010).

Therefore we hypothesize:

H5: Perceived organizational support negatively affects customers' experienced strain.

Second, evidence for a negative effect of task demands on work engagement exists. Task demands exhaust an individual's physical and psychological energy, thereby hindering engagement (Nahrgang et al., 2011). Further, demands hinder the accomplishment of goals or the fulfilment of the need for autonomy, competence or relatedness and, thus, individuals are less willing to invest themselves in their work. Previous employee research empirically confirms the adverse impact of task demands on an individual's engagement (Bakker, Hakanen, Demerouti, & Xanthopoulou, 2007; Hakanen, Bakker, & Demerouti, 2005). Nahrgang et al. (2011) specifically argue that physical and mental demands lower employee engagement. In a self-service setting, Collier and Barnes (2015) discover that perceived time pressure reduces customer

experiences of enjoyment and delight. Thus, in co-production, task demands may hinder customer engagement.

As a result we hypothesize:

H6: a) Quantitative workload and b) qualitative workload negatively affect customers' task engagement.

Third, a negative impact of perceived strain on task engagement is in line with Leiter's (1993) view of burnout as a developmental process. Psychological distress gradually depletes a person's energy levels (Zablah et al., 2012), such that strained individuals lack the energy to fully invest themselves in their job. Moreover, psychologically withdrawing from a task (i.e., becoming less engaged) forms a way to deal with the related stress (Bakker et al., 2004). Organizational literature supports this negative relationship between psychological distress and engagement (e.g., Bakker et al., 2004; Schaufeli and Bakker, 2004; Zablah et al., 2012). In the co-production domain, Meuter, Ostrom, Bitner and Roundtree (2003) demonstrate that technological anxiety reduces customers' positive attitude towards self-service technologies.

Consequently we hypothesize:

H7: Customers' experienced strain negatively affects customers' task engagement.

#### **4.4.4 Demand-resource interaction: The buffer process**

In addition to the main effects stated above, the J D-R model suggests an interaction effect between task resources and demands. According to the model, the positive effect of task demands on psychological strain can be buffered by available task resources (Schaufeli & Taris, 2014). In the face of high task demands, resources help employees effectively deal with the stressful work conditions and fulfil their tasks. This way resources can attenuate the negative psychological responses to job stressors.

In their study among employees of home care organizations, Xanthopoulou et al. (2007) found empirical support for this demand-resource interaction. In 66

percent of examined cases, high demands did not lead to exhaustion or cynicism when sufficient resources were available. Furthermore, Bakker, Demerouti and Euwema (2005) discovered that work overload, physical and emotional demands do not lead to higher levels of burnout among employees of a higher education institute if they have access to the necessary job resources (e.g., social support and regular feedback).

Perceived organizational support may reduce the adverse consequences of stressors by assuring that organizational aid is available when required (Rhoades & Eisenberger, 2002). Thus, POS helps individuals cope with the demands of a task through instrumental and/or emotional help (Bakker & Demerouti, 2007). This may be specifically salient in co-production where customers are confronted with new tasks and responsibilities which can create cognitive costs (Meuter et al., 2005; Wang et al., 2013). Consequently, we expect the impact of co-production demands on strain to be amplified (reduced) when co-production resources are low (high).

This results in the following hypothesis:

H8: The positive effect of a) quantitative workload and b) qualitative workload on customers' experienced strain is weaker (stronger) when organizational support is high (low).

#### **4.4.5 Demand-resource interaction: The resource activation process**

Besides the resource buffering effect on the demands - strain relationship, the J D-R model proposes a second way in which resources and demands may interact. According to the Conservation of Resources (COR) theory (Hobfoll, 1998), resources, because they are instrumental in goal achievement, become particularly salient and possess added motivational power when individuals face high task demands (Bakker & Demerouti, 2007). COR theory recognizes people's striving to acquire and hold onto valuable things and views strain as a consequence of a (potential) resource loss (Hobfoll, 2001). Further, the impact of resource acquisition itself is rather small, though becomes prominent when facing a (possible) loss of resources (Hobfoll, 2002). Thus, resources become especially beneficial when people need them the most (i.e., in highly stressful

situations). As a result, when task demands are high, task resources likely exert a stronger influence on work engagement.

Indeed, in a sample of Finnish teachers, task resources were most relevant in keeping teachers engaged to their job when pupil misconduct was high (Bakker et al., 2007). A study among Finnish dentists produced conceptually similar results (Hakanen et al., 2005). In demanding situations (e.g., high workload and an unfavourable physical environment) the impact of task resources (e.g., variability in the required professional skills and peer contacts) on task engagement was strongest. Translated to our co-production context, receiving support from the firm more strongly motivates engagement when customers are confronted with a high quantitative and/or qualitative workload.

This leads to the following hypothesis:

H9: The positive effect of perceived organizational support on customers' task engagement is stronger (weaker) when a) quantitative workload and b) qualitative workload is high (low).

## **4.5 RESEARCH METHODOLOGY**

### **4.5.1 Research setting and data collection**

Our research is carried out in a do-it-yourself (DIY) context. More specifically, a Belgian firm offering DIY kits for the installation of ventilation, heating and/or plumbing in new houses as well as renovation projects is chosen as the specific setting for testing our hypotheses. This type of DIY is rather complex and requires an extensive contribution of customers in terms of time and effort (i.e., physical and mental).

We sample customers who finished their DIY project in the last three and a half years, so there is a high likelihood that they can recall and comment on their experiences. Respondents were recruited for the study through an informative letter from the DIY firm's CEO, asking for their participation in an online customer survey to improve the DIY kits. This letter emphasized the confidentiality of respondents' answers and clarified the reward for participating



(i.e., a gift certificate for a DIY store). Afterwards, the link to the online questionnaire was sent to the respondents via e-mail.

We conducted two follow-ups, where we e-mailed non-respondents after one week intervals, urging them to fill in the questionnaire and reminding them of the associated reward. Ultimately, of the 481 respondents contacted, 138 completed the questionnaire, resulting in a response rate of 28.7%. After data cleaning, 133 usable questionnaires remained. The mean age of respondents was 36 years ( $SD = 9.8$ ). The sample included 115 men (86.5%) and 18 women (13.5%). The predominance of men in our sample could be expected, given the setting at hand.

#### **4.5.2 Questionnaire design**

To measure our constructs, we used existing scales and adapted them to the setting at hand. Extra-role behaviour was evaluated on nine-point Likert-type scales with the anchors "Very unlikely" (1) and "Very likely" (9). All other constructs were assessed on nine-point Likert-type scales with the anchors "Strongly disagree" (1) and "Strongly agree" (9).

For the co-production demands, we adjusted six items from Karasek (1979) to assess qualitative workload and seven items from Van Veldhoven and Meijman (1994) to measure quantitative workload. For the co-production resources, we evaluated organizational support by thirteen items from Bettencourt (1997). To measure experienced strain, a four-item scale drawing from Keller (2001) was used. We examined engagement by means of the UWES-9 questionnaire, which consists of three items for absorption, dedication and vigour (Schaufeli, Bakker, & Salanova, 2006). In-role behaviour was estimated using a five-item scale from Groth (2005). Regarding extra-role behaviour, we assessed word-of-mouth behaviour and customer feedback with three-item scales from Yi and Gong (2013). We focussed on these two customer extra-role behaviours as research frequently mentions them as antecedents of business performance (Eisingerich et al., 2014; Kumar et al., 2010). Table 16 summarizes the correlations between model constructs. An overview of the questionnaire items can be found in Appendix to this chapter.

**Table 16:** Construct correlations

	1	2	3	4	5	6	7	8	9	10
1. Absorption	1.00									
2. Dedication	.74	1.00								
3. Feedback to firm	.34	.33	1.00							
4. In-Role behaviour	.40	.34	.40	1.00						
5. Org. support	.21	.34	.42	.27	1.00					
6. Qualitative WL	.19	.03	.16	.10	.01	1.00				
7. Quantitative WL	-.28	-.32	-.20	-.31	-.33	.10	1.00			
8. Strain	-.27	-.42	-.15	-.19	-.39	.31	.39	1.00		
9. Vigour	.59	.73	.19	.37	.28	.00	-.26	-.47	1.00	
10. Word-of-mouth	.21	.32	.46	.29	.79	-.03	-.15	-.39	.24	1.00

Furthermore, we included respondents' gender, age and DIY experience as control variables in our model. According to previous research, gender and age can affect customers' participative behaviours (Eisingerich et al., 2014; Guo et al., 2013). Also, respondent's previous DIY experience might impact an individual's wellbeing and performance. We evaluated customer experience by adapting three items from Meuter et al. (2005).

#### 4.5.3 Analytical approach

To test the relationships of our conceptual model, we used a partial least squares approach to structural equation modelling (PLS-SEM) and, more specifically, the SmartPLS 3 software package (Ringle et al., 2015). Several reasons underlie this choice (Hair et al., 2012). First, PLS-SEM can handle reflective as well as formative constructs, both of which can be found in the C D-R model, very effectively. Second, PLS-SEM properly addresses our exploratory research goal of identifying drivers of and, thus, predicting customer participative behaviours.

In line with the directives of Jarvis et al. (2003), the co-production demands and resources, experienced strain, in-role behaviour and the two extra-role behaviours were modelled as first-order reflective constructs. Following previous research, we conceptualized engagement as a second-order reflective-formative construct (Rich et al., 2010), formed by the first order latent variables "Absorption", "Vigour" and "Dedication" (Bakker, 2011). To analyze co-production task engagement as a second-order construct, we opted for the two-

stage estimation approach proposed by Reinartz et al. (2004). In the first stage, we estimated the model with all first-order constructs (i.e., absorption, vigour and dedication) but without the second-order construct (i.e., engagement) to obtain the latent variable scores (Leroi-Werelds et al., 2014). In the following stage, these latent variable scores formed the indicators of the second-order engagement construct.

To test the demands-resource interaction effects, we applied the method put forward by Henseler and Chin (2010). Their procedure comprises the following two stages. First, the main effects PLS model (without the interaction terms) is estimated to derive latent variable scores for each construct. Second, we multiply the latent variable scores of the exogenous and moderator construct. This results in a single-item measure for the interaction term. Then, the PLS model (with interaction terms) is estimated again with a single-item measure for all constructs, based on the latent variable scores (Hair et al., 2014).

For the analysis of our data, we used the default PLS algorithm settings (i.e., path weighting scheme, 300 iterations and stop criterion of  $1 \times 10^{-7}$ ) (Hair et al., 2014). To assess the statistical significance of the parameter estimates, we used percentile bootstrap confidence intervals based on 5000 samples (Hair et al., 2011; Preacher & Hayes, 2008).

## **4.6 RESULTS**

### **4.6.1 Measurement model evaluation**

To evaluate the psychometric properties of our model constructs, we followed the guidelines of Leroi-Werelds et al. (2014) and Hair et al. (2014).

**Reflective constructs** First, we assessed the unidimensionality of the model constructs via their eigenvalues. Next, we evaluated internal consistency reliability by means of the composite reliability. Every construct exhibited desirable values (i.e.,  $\rho_c > .70$ ). Further, we established indicator reliability by examining the magnitude of the measurement items (loadings  $> .708$ ) and verifying that they load significantly on their respective latent variables. In

addition, the average variance extracted (AVE) exceeds the 0.50 threshold, thereby confirming convergent validity. Finally, for the reflective constructs discriminant validity is demonstrated by means of the HTMT<sub>90</sub> criterion (Henseler et al., 2015).

**Formative construct** For the only formative construct in our model, the second-order latent variable “Engagement”, multicollinearity posed no problem, as evidenced by the variance inflation factor (VIF < 5). Further, all construct indicators were deemed statistically significant. Finally, we determined discriminant validity by ascertaining that the absolute value of 1 does not fall within two standard errors of the latent variable correlations.

Overall, our data exhibit very good psychometric properties. The exact data characteristics can be found in this chapter’s Appendix.

#### **4.6.2 Structural model evaluation**

As the reliability and validity of the construct measures is established, we can turn to the examination of the structural model. As evidenced by the confidence intervals accompanying the coefficients of determination (R<sup>2</sup> measures), our C D-R framework explains a significant part of the variance in customers’ participative behaviours (see Table 17). The model explains 27% of the variance in customers’ in-role performance, 23% of the variance in word-of-mouth behaviour and 18% of the variance in the feedback given to the firm. Regarding customer wellbeing, the combined effects of co-production demands and resources account for 38% of the variance in experienced strain and 31% of the variance in task engagement.

**Table 17:** Predictive validity of the Co-production Demands-Resources model

<b>Predictive validity</b>		
	<b>R<sup>2</sup></b>	<b>95% CI<sup>a</sup></b>
Experienced strain	.38	[.28;.55]
Task engagement	.34	[.27;.52]
In-role behaviour	.27	[.17;.43]
Word-of-mouth	.23	[.16;.37]
Feedback to the firm	.18	[.10;.31]

<sup>a</sup> 95% percentile bootstrap confidence interval based on 5000 bootstrap samples

Following this satisfactory predictive validity of the conceptual framework, we examined the structural model relationships in order to evaluate our research hypotheses (see Table 18).

Concerning the health impairment process, both quantitative workload and qualitative workload displayed a significant and positive effect on experienced strain ( $\beta = .21$ ,  $CI_{99\%} = [.02;.38]$ ;  $\beta = .27$ ,  $CI_{95\%} = [.09;.42]$  respectively), thereby supporting hypotheses H1a and H1b. Further, strain did not influence customers' in-role behaviour ( $\beta = .11$ ,  $CI_{90\%} = [-.03;.27]$ ) or feedback to the firm ( $\beta = .08$ ,  $CI_{90\%} = [-.09;.25]$ ) but did negatively impact word-of-mouth ( $\beta = -.29$ ,  $CI_{99\%} = [-.51;-.03]$ ). Hence, hypothesis H2a is not supported, whereas hypothesis H2b is partially supported. Turning to the motivational process, we did not find support for hypothesis H3 as organizational support did not impact task engagement ( $\beta = .07$ ,  $CI_{90\%} = [-.13;.29]$ ). Further, we observed no influence of task engagement on word-of-mouth ( $\beta = .14$ ,  $CI_{90\%} = [-.04;.33]$ ). Nevertheless, we detected a positive link between task engagement and both in-role behaviour ( $\beta = .37$ ,  $CI_{99\%} = [.05;.64]$ ) and feedback to the firm ( $\beta = .31$ ,  $CI_{95\%} = [.09;.51]$ ). Accordingly, hypothesis H4a is supported, whereas hypothesis H4b is partially confirmed.

**Table 18:** Overview of structural model relationships

Hypothesized relationship	Path coefficient $\beta$	Confidence interval <sup>a</sup>	Supported?
H1a Quantitative workload → Experienced strain (+)	.21	[.02; .38]***	Yes
H1b Qualitative workload → Experienced strain (+)	.27	[.09; .42]**	Yes
H2a Experienced strain → In-role behaviour (-)	.11	[-.03; .27]	No
H2b Experienced strain → Word-of-mouth (-)	-.29	[-.51; -.03]***	Yes
H2b Experienced strain → Feedback to firm (-)	.08	[-.09; .25]	No
H3 Organizational support → Task engagement (+)	.07	[-.13; .29]	No
H4a Task engagement → In-role behaviour (+)	.37	[.05; .64]***	Yes
H4b Task engagement → Word-of-mouth (+)	.14	[-.04; .33]	No
H4b Task engagement → Feedback to firm (+)	.31	[.09; .51]**	Yes
H5 Organizational support → Experienced strain (-)	-.24	[-.42; -.05]***	Yes
H6a Quantitative workload → Task engagement (-)	-.17	[-.34; -.01]*	Yes
H6b Qualitative workload → Task engagement (-)	.24	[.01; .48]**	No (+)
H7 Experienced strain → Task engagement (-)	-.37	[-.61; -.09]***	Yes
H8a QN WL x Org. Supp. → Experienced strain (-)	.14	[.002; .28]*	No (+)
H8b QL WL x Org. Supp. → Experienced strain (-)	-.05	[-.17; .09]	No
H9a Org. Supp. x QN WL → Task engagement (+)	-.11	[-.25; .05]	No
H9b Org. Supp. x QL WL → Task engagement (+)	-.13	[-.30; .04]	No

<sup>a</sup> Percentile bootstrap confidence interval based on 5000 bootstrap samples.

\*CI 90%; \*\*CI 95%; \*\*\*CI 99%

Regarding the crosslinks between the health impairment and motivational process, the results verified that these psychological processes are indeed dependent. Hypothesis H5, concerning the negative influence of organizational support on experienced strain, is corroborated by our findings ( $\beta = -.24$ ,  $CI_{99\%} = [-.42;-.05]$ ). Likewise, we can support hypothesis H7, implying that experienced strain reduces customers' engagement ( $\beta = -.37$ ,  $CI_{99\%} = [-.61;-.09]$ ). Further, only partial evidence was found for hypothesis H6, regarding a negative demands-engagement relationship. Quantitative workload substantially lowers task engagement ( $\beta = -.17$ ,  $CI_{90\%} = [-.34;-.01]$ ). However, interestingly, we discovered a significant positive effect of qualitative workload on task engagement, indicating that a complex task, requiring constant concentration, in fact stimulates engagement ( $\beta = .24$ ,  $CI_{95\%} = [.01;.48]$ ).

Next, we tested the buffering potential of co-production task resources. Surprisingly, the analysis outcome revealed a significant positive effect of the organizational support-quantitative workload interaction on experienced strain ( $\beta = .14$ ,  $CI_{90\%} = [.003;.28]$ ). To dig deeper into this counterintuitive interaction, we conducted a simple slope analysis (see Figure 15). As the figure shows, the positive relationship between quantitative workload and experienced strain is stronger for customers who could count on high (versus low) organizational support. Alternatively, the findings did not convey any significant moderation by qualitative workload ( $\beta = -.05$ ,  $CI_{90\%} = [-.17;.09]$ ). Hence, hypotheses H8a and H8b, stating that resources can attenuate the adverse effect of demands on strain, are not substantiated. Finally, the examination of the resource activation process uncovered no significant moderating effect of quantitative workload ( $\beta = -.11$ ,  $CI_{90\%} = [-.25;.05]$ ) or qualitative workload ( $\beta = -.13$ ,  $CI_{90\%} = [-.30;.04]$ ) on the relationship between organizational support and task engagement.

**Figure 15:** Interaction effect of quantitative workload and organizational support on experienced strain

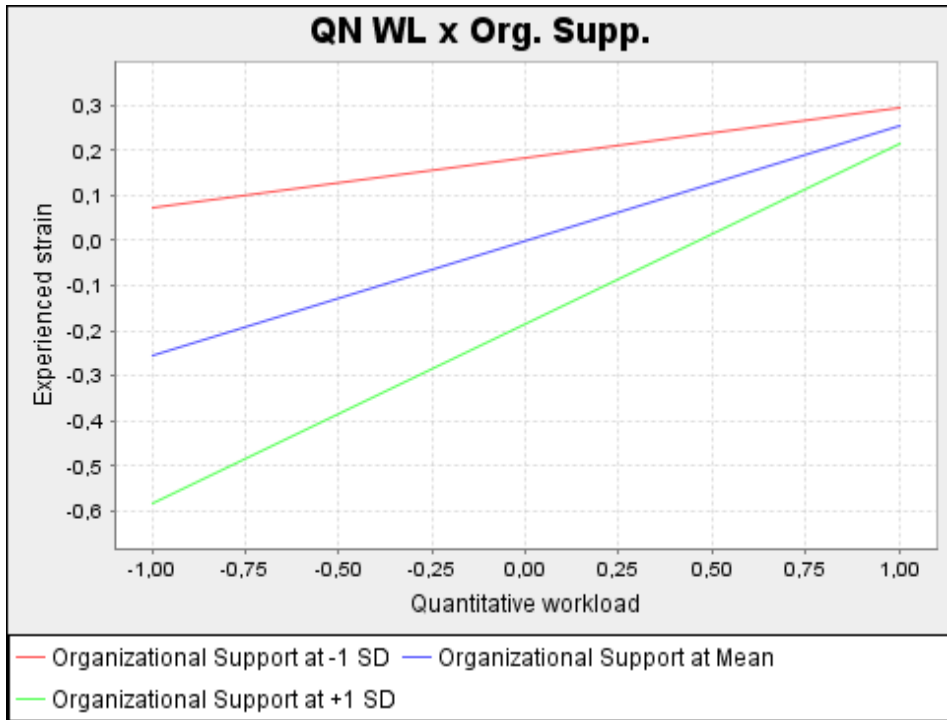
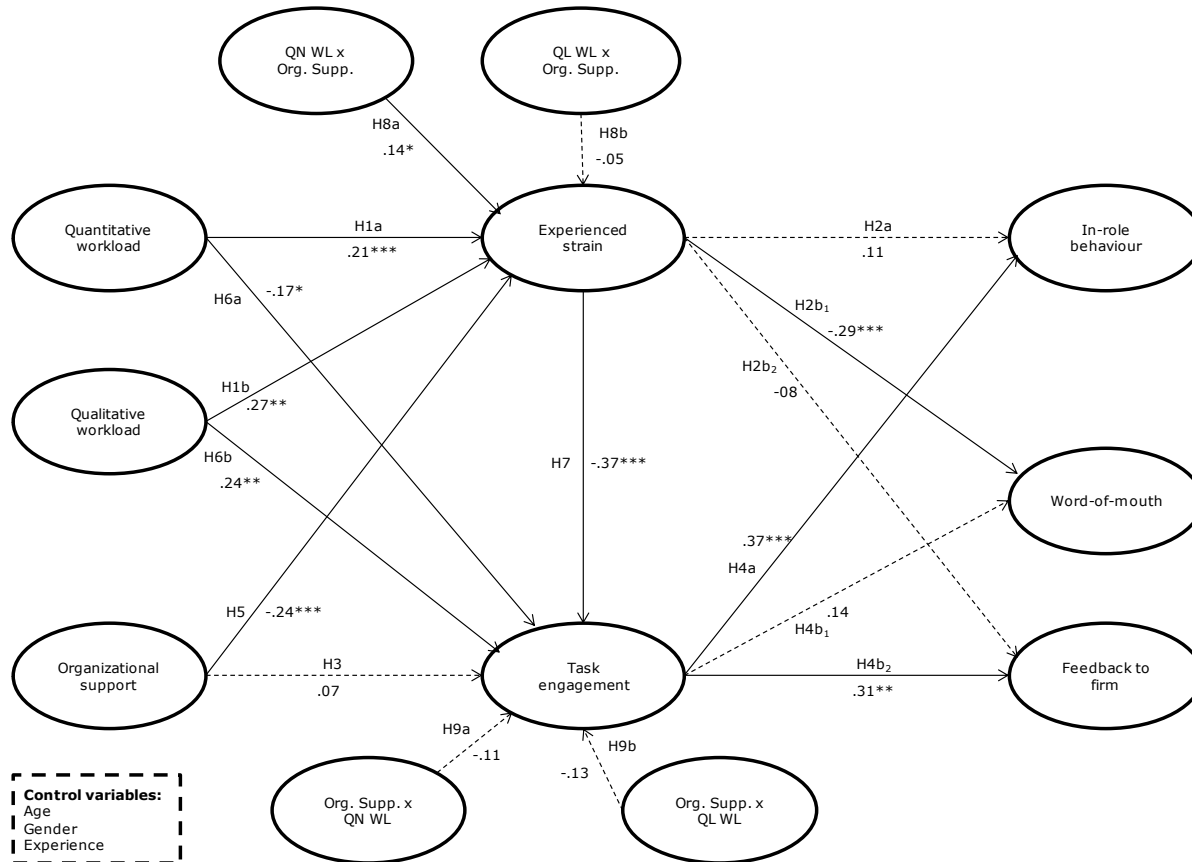


Figure 16 presents a visual overview of all structural model relationships in the Co-production Demands-Resources model.



**Figure 16:** Estimated Co-production Demands-Resources model



\* CI 90%; \*\* CI 95%; \*\*\* CI 99%

Note: Statistically insignificant relationships are indicated by dotted lines between constructs.

In order to get a more detailed picture of the influences of co-production task demands and resources on customer participative behaviours, we evaluated the total effects (see Table 19). This adds valuable information as the demands-resources model contains both a strain and engagement mechanism through which the task characteristics impact customer behaviour. First, through its adverse relation with both strain and engagement, quantitative workload significantly and negatively affected all three customer participative behaviours. Second, remarkably, for qualitative workload we observed an overall positive effect. The indirect negative effect of qualitative workload on engagement via strain, combined with its surprising direct positive impact on engagement, resulted in an overall positive influence of qualitative workload on task engagement and, as such, on in-role behaviour and feedback to the firm. Third, an examination of the total effects of organizational support revealed a significant relation with strain experienced during co-production and customers' word-of-mouth actions. Fourth, the interaction of quantitative workload and organizational support reduced, via strain, customers' engagement and word-of-mouth behaviour. However, both these effects just barely reached significance (respectively,  $\beta = -.05$ ,  $CI_{90\%} = [-.11;-.001]$  and  $\beta = -.05$ ,  $CI_{90\%} = [-.10;-.001]$ ). For the qualitative workload - organizational support interaction, we observed no significant link with any of the model constructs. Finally, for the resource activation interactions (i.e., Org. Supp. x QN WL and Org. Supp. x QL WL), we also discovered no significant impact on customer wellbeing or customer participative behaviours.

**Table 19:** Total effect estimates

	Strain	Engagement	In-role	Extra-role	
				WOM	Feedback
Quantitative workload	.26***	-.30***	-.08**	-.12***	-.08**
Qualitative workload	.28***	.15*	.09**	-.06	.07*
Organizational support	-.18**	.13	.03	.07**	.03
QN WL x Org. Supp.	.14*	-.05*	-.003	-.05*	-.01
QL WL x Org. Supp.	-.05	.02	.001	.02	.002
Org. Supp. x QN WL		-.11	-.04	-.02	-.04
Org. Supp. x QL WL		-.13	-.05	-.02	-.04
Experienced strain		-.36***	-.02	-.34***	-.04
Task engagement			.37***	.14	.31***

\* $p < .10$ ; \*\* $p < .05$ ; \*\*\* $p < .01$

### **Control variables**

Each control variable displayed a significant influence on one or more model constructs. However, as we also tested our conceptual model without control variables, they did not influence the significance or direction of the hypothesized relationships. Gender showed a significant influence on task engagement ( $\beta = -.21$ ,  $CI_{90\%} = [-.35;-.02]$ ), with men exhibiting a greater engagement towards the task. Age exerted a positive effect on customer participative behaviours. Older customers reported higher in-role behaviour ( $\beta = .28$ ,  $CI_{99\%} = [.09;.45]$ ), word-of-mouth ( $\beta = .26$ ,  $CI_{99\%} = [.07;.45]$ ) and feedback to the firm ( $\beta = .28$ ,  $CI_{99\%} = [.04;.49]$ ). Finally, customers' DIY experience reduced the strain they endured during co-production ( $\beta = -.18$ ,  $CI_{95\%} = [-.33;-.03]$ ).

## **4.7 DISCUSSION**

Overall, the results support the conceptualized Co-production Demands-Resources model and underscore the significance of careful task design for effective customer behaviours. However, shaping customer behaviours involves managing an intricate web of task resources and demands.

First, the findings evince a demands  $\rightarrow$  strain  $\rightarrow$  performance chain, thereby substantiating the existence of a health impairment process in co-production. Both quantitative and qualitative workload increased the strain experienced by customers, which, in turn, reduced giving positive word-of-mouth. Further,

these two task demands impacted customers' level of engagement. However, astoundingly, where quantitative workload lowered engagement, as hypothesized, qualitative workload actually heightened task engagement. Thus, quantitative workload acts as a hindrance demand, whereas qualitative workload represents a challenge demand. Only few studies refer to this distinction in the nature of demands. Both hindrance and challenge demands are viewed as stressful and deplete energy levels, therefore increasing experienced strain (Crawford, Lepine, & Rich, 2010). However, they differ in their effect on engagement. Hindrance demands prevent learning, personal growth, task achievement or future gains and employees perceive these demands as barriers that inhibit goal accomplishment and good performance (Nahrgang et al., 2011). Challenge demands on the other hand stimulate personal growth and mastery and are judged as opportunities for learning, achievement and demonstrating competence. Co-producers likely appraise quantitative workload as a hindrance demand, because the co-production task comes on top of their regular job. In contrast, they might see qualitative workload as a challenge and a possibility for personal growth as it offers them variety and excitement by tapping into different capacities than used during daily work. Etgar (2008) posits that this deviation from routine is valuable to customers and gives the example of an office worker who loves doing carpentry work in his home.

Turning to the motivational process, the results could not fully confirm the resources → engagement → performance relationship. While engagement positively influenced customers' in-role and feedback giving behaviour, perceived organizational support did not affect customers' task engagement. Also, contrary to the resource activation theory, organizational support did not become a salient predictor of customers' engagement in the face of high task demands. This absence of significant effects may be explained by the study context. While strong evidence exists for the motivating role of social support in an employee setting (Bakker & Demerouti, 2007; Schaufeli & Taris, 2014), in co-production other resources might be more salient. Customers, as paying clients, might perceive organizational support as a hygiene factor, such that its absence creates dissatisfaction but its presence does not enhance motivation (Herzberg, 2003). Nonetheless, perceived organizational support significantly

reduced co-producer's strain and via that route increased their WOM behaviour, thereby partially neutralizing the negative effects of task demands.

Further, we predicted that task resources can buffer the adverse effects of demands on experienced strain. However, for qualitative workload we found no effect, while the results revealed an opposite effect for quantitative workload. Quantitative workload particularly influences strain when customers experience high organizational support. According to Halbesleben and Buckley (2004a), social support may be counterproductive as it exacerbates stressor effects by masking their presence. This way, valuable time is taken up, that could otherwise have been used to effectively deal with the stressor. Another potential explanation might be found in equity theory (Walster, Walster, & Berscheid, 1978). Quantitative demanding tasks require substantial inputs from the customer in the form of effort and time (Haumann et al., 2015). Possibly customers deem the organizational support received in return not sufficient to compensate for these inputs, creating feelings of unfairness and, subsequently, psychological distress. Notably, although statistically significant, the QN WL x Org. Supp. interaction effect displayed a low practical significance. Adding the interaction to our model only explained 1% of unique variance in experienced strain (i.e., increase from 37% to 38%). Previous research on the J D-R theory noted that the added predictive validity of interactions between demands and resources can be very small (i.e.,  $R^2$  value of .02 or smaller) (Bakker et al., 2005).

Finally, the research findings uncovered distinct drivers for the three co-production participative behaviours. Experienced strain only predicted customer word-of-mouth behaviour while task engagement drove the fulfilment of role responsibilities and the provision of constructive feedback and suggestions to the firm. According to Bakker et al. (2004), result-based compensation systems prevent highly strained employees from lowering primary task performance. In a similar vein, strained co-producers might focus on their in-role performance to guarantee an acceptable final outcome, yet withhold discretionary WOM behaviours as this does not impact them personally.

## **4.8 CONCLUSION AND IMPLICATIONS**

Despite agreement on the significance of effective customer performance for co-production success (Bove et al., 2009; Yi et al., 2011), thus far, research on how to manage customers' production contributions has been scarce. Therefore, building on the notion of co-producing customers as partial employees, we integrated Job Demands-Resources theory with co-production literature and examined co-production task design as a determinant of customer participative behaviours. The resulting Co-production Demands-Resources framework clarifies how task demands and resources affect customers' wellbeing and subsequently their in-role and extra-role behaviours. Overall, this study complements academic research by shedding light on the drivers of customer participative behaviours in co-production as well as contributes to practice by providing managerial guidelines for creating effective co-production experiences.

### **4.8.1 Theoretical implications**

The study findings are encouraging and offer new insights for establishing co-production as a successful alternative to full-service options. Previous literature mainly focused on customers' motivations to co-produce (e.g., Dabholkar and Bagozzi, 2002; Meuter et al., 2005) and on the consequences of co-production for customer evaluations (e.g., Bendapudi and Leone, 2003; Troye and Supphellen, 2012). We connect these two streams by examining how to manage customer behaviours during co-production. As such, this research enhances existing theory in several ways.

First, the findings provide further evidence for the applicability of human resource management theories to the co-production domain. Specifically, we present the J D-R model as suitable for predicting customer participative behaviours in co-production. This adds to our academic knowledge on the determinants of effective co-production experiences. In addition, the study contributes considerable to the theoretical development of the J D-R model by, for the first time, testing its assumptions in a customer context. The results largely confirm its central processes but also unveil several key dissimilarities. Though generally validated in an employee setting, perceived organizational

support does not increase customers' task engagement. Further, instead of buffering the adverse impact of task demands, co-production resources can enhance the detrimental influence of demands on customers' experienced strain. Moreover, in our customer setting, we found no evidence for a resource activating effect.

Second, the study theoretically explains and empirically demonstrates the psychological mechanism that underlies effective customer participation in production. While co-production's effect on employee wellbeing has received some attention (e.g., Chan et al., 2010; Hsieh and Yen, 2005), the psychological implications for customers are under researched. According to our findings, poorly designed co-production tasks create strain while well designed work environments stimulate engagement. Further, with strain reducing customer engagement, a negative relationship between different dimensions of wellbeing is observed. This adds to the work of Guo et al. (2013) who argue that co-production unequivocally enhances customer wellbeing. In addition, these findings contribute notably to the recent transformative service research stream by improving insight into the effects of co-production on customers' welfare and quality of life (Anderson & Ostrom, 2015).

Finally, we illustrate the relevance of distinguishing between customer in-role and extra-role performance, as different psychological processes underlie both participative behaviours. A negative health impairment process, driven by the strain customers experience during co-production, is responsible for the level of favourable word-of-mouth. In contrast, customers' in-role behaviour and their provision of constructive feedback is the result of a positive motivational process, depending on customers' degree of task engagement. Looking further in the C D-R model, the interplay of positive and negative job characteristics guides these mental states. Quantitative workload, a hindrance demand, has an adverse effect on all three participative behaviours, whereas qualitative workload, a challenge demand, stimulates in-role behaviour and feedback provision. Additionally, organizational support, a task resource, promotes WOM. Thus, analogous to the trade-off between negative and positive value elements predicting customers' co-production decision, as discussed in Chapter 2 of this

dissertation, effective customer performance is driven by both negative and positive task elements.

#### **4.8.2 Managerial implications**

Practically, the Co-production Demands-Resources model makes customer participative behaviour assessable to management intervention. Through changes in co-production task design, firms can foster customers' wellbeing and, thereby, stimulate their in-role as well as extra-role performance. This enables firms to reap the economic benefits associated with co-production as these behaviours impact co-production quality, customer satisfaction and, ultimately, firm profitability. Additionally, customers gain from improvements in co-production task design via an enhancement in their personal welfare. Hence, via sensible task design, co-production can result in a win-win situation for the customer and the firm, which is a necessary condition for sustainable co-production (Xia & Suri, 2014).

Since in-role and extra-role behaviours exhibit a distinct pattern of causes, different strategies should be employed in order to heighten these behaviours. Experienced strain determines positive WOM, while task engagement drives in-role behaviour and feedback provision. As a result, both strain reduction and engagement promotion are highly salient. Even more as the strain-engagement link implies an indirect effect of strain on in-role and extra-role customer behaviour. Though management can not directly influence customers' psychological states, customer wellbeing is an outcome of co-production task design, which is under managerial control. Thus, firms should address the demands faced by and the resources available to customers.

To achieve this, managers have several possible strategies at their disposal: adjusting existing task demands, increasing available resources or creating new valuable resources.



### ***Adjust existing demands***

The influence of co-production demands on customer wellbeing and performance depends on the specific type of the demand. Therefore, it is crucial to distinguish between hindrance and challenge demands.

*Reduce hindrance demands* Customers perceive hindrance demands as obstacles that impede goal achievement (Crawford et al., 2010). These demands adversely affect both strain and engagement and, consequently, impede customer in-role as well as extra-role performance. Hence, firms should try to reduce overwhelming task demands. One possible way to mitigate time pressure (i.e., quantitative demand) is by decreasing task uncertainty (Collier & Barnes, 2015). Firms can, for example, enhance signage or hand customers more extensive task-related information and instructions. However, the nature of hindrance demands may render it difficult or even impossible to really lower them. In these cases, firms can attempt to change customers' task perceptions and activate a reevaluation of hindrance demands as challenges (Babakus et al., 2009). Another potentially effective tool to alleviate the strain caused by task demands, is to provide realistic job previews where customers receive honest and complete information on the tasks they have to perform (Halbesleben & Buckley, 2004a). These previews bring customer expectations more in line with actual co-production experiences, thereby reducing chances of not meeting customer expectations and thus diminishing psychological distress.

*Optimize challenge demands* Customers appraise challenge demands as opportunities to stimulate mastery, personal growth, or future gains (Crawford et al., 2010). Challenge demands enhance psychological strain, but also foster task engagement and their handling is thus less straightforward. In our study, we observed an aggregate favourable effect of qualitative workload. Combined, it's opposing influences on strain and engagement partially cancelled each other out, leaving a positive influence on in-role performance and feedback provision. Nonetheless, vigilance is recommended as there may exist a certain threshold beyond which challenges turn into hindrances. In line with goal-setting theory, challenging and relatively difficult goals heighten an individual's motivation, as long as they are attainable (Locke & Latham, 2006). Otherwise,

the individual can become frustrated. Therefore, firms should assess which co-production demands are viewed as challenges, determine their optimal level and then carefully monitor them.

### ***Increase available resources***

If it is not economically or operationally feasible to adjust demands, firms can provide additional co-production resources. When customers can draw on many resources while fulfilling the co-production task, the negative consequences of task demands can be offset and customer participative behaviours can be fostered. Although perceived organizational support (POS) displayed no direct effect on engagement, it significantly reduced experienced strain and stimulated positive WOM. Unfortunately, POS also demonstrated an activation effect, strengthening the detrimental influence of quantitative workload on strain. Nonetheless, this effect is small and hardly reaches significance, leaving an overall positive impact of POS on customer wellbeing and participative behaviour. As it represents a flexible and modifiable resource, several management practices to engender POS are available. For example, firms can set up channels to enhance an open communication with customers (Neves & Eisenberger, 2012). Further, they can organize employee trainings for a more supportive attitude or implement organization-based programs that show interest and care for customer needs and concerns (e.g., suggestion programs, focus groups and surveys) (Saks, 2006).

### ***Create new resources***

Finally, co-production firms seeking to elicit more effective customer participation can invest in new resources. The same motivational mechanism responsible for the impact of increases in existing resources, causes the strain reducing and positive performance effects of new resources. In addition, unlike POS, other task resources might be capable of directly promoting customer engagement and/or buffering the negative effects of high task demands. For instance, offering customers regular feedback on their progress might affect customer wellbeing and performance (Halbesleben & Stoutner, 2013). Constructive feedback enhances learning and increases the chance of reaching one's goals, thereby being both intrinsically and extrinsically motivating

(Schaufeli et al., 2009). To be effective, feedback must indicate what went wrong and how the customer can improve his performance (Halbesleben & Buckley, 2004b).

In summary, our research introduces task design as an effective tool for customer performance management in co-production, thereby aiding firms in the design of successful co-production initiatives. Managers can customize the developed C D-R model to their particular initiative and then implement tailor-made interventions to improve customer task and contextual performance.

#### **4.9 DIRECTIONS FOR FURTHER RESEARCH**

Although our study provides some prime insights into the crucial question of how to manage customer behaviours to induce effective co-production, more remains to be learned.

First, considering the cross-sectional nature of our study design, a longitudinal study can help to draw causal inferences regarding the model relationships. While co-production demands and resources influence customer wellbeing and participative behaviours, it is conceivable that these are in turn predictors of the demands and resources perceived by customers during co-production. One could, for instance, argue that extra-role performance is an antecedent of task resources, since exhibiting voluntary, beneficial behaviours may foster a more appreciating and supportive attitude towards the customer. In an employee management context, several authors already found preliminary evidence for a reciprocal causation (e.g., Hakanen, Perhoniemi and Toppinen-Tanner, 2008; Schaufeli et al., 2009). Hence, further longitudinal studies should be conducted to account for this potential reversed causal effect in a co-production setting.

Also, future co-production research could combine self-report measures with objective measures to increase the strength of the discovered effects. Owing to common method variance, the sole use of self-report measures might inflate the strength of the model relationships. However, following the guidelines of Podsakoff et al. (2003), we carefully designed our study to minimize this effect.

In addition, previous employee research revealed similar findings when using objective performance measures. For instance, Demerouti et al. (2001) integrated observer ratings of task demands and resources into the J D-R model and found highly equivalent results as when using self-reports. Moreover, Schaufeli et al. (2009) confirmed the motivational and health impairment process by including company registered absenteeism data. Likewise, Xanthopoulou, Bakker, Demerouti and Schaufeli (2009) featured daily financial returns as the dependent variable in their study and verified the resources - engagement - performance link.

Third, as the present study focused on only one firm in the DIY sector, future studies in other firms and co-production settings would increase the strength and generalizability of our findings. Nonetheless, as our conceptual model is based on sound theoretical underpinnings, we believe that the results can be extended to other co-production contexts.

Further, future research would do well to examine other co-production task resources to see if they affect engagement directly and/or are able to buffer against the adverse effects of demands. Employee literature strongly supports the ability of task resources to increase engagement, making them important in their own right (e.g., Crawford et al., 2010; Nahrgang et al., 2011; Schaufeli et al., 2009; Schaufeli and Bakker, 2004). Proof for the attenuating impact of certain resources on the demand - strain relationship would offer firms a clear advantage, as it implies that customer wellbeing and performance can be maintained even when it is difficult to lower demands or redesign tasks. In this regard, the role of manageable personal resources like customers' self-efficacy may form a promising research avenue (Schaufeli & Taris, 2014).

Moreover, further research could investigate which task demands are appraised as a hindrance or challenge by co-producers as this distinction is crucial in determining the organizational strategy to tackle them. Finally, by not only focusing on firm processes (i.e., demands and resources), but also on customer related processes (i.e., wellbeing), our model encourages researchers to consider alternate ways to increase participative co-production behaviours.

To conclude, this study advances firms' understanding on how to effectively manage their customers' participative behaviours during the co-production experience. As these behaviours affect the quality of the co-production outcome, customer satisfaction and eventually organizational profitability, being able to proactively direct customers' co-production contributions represents a valuable competitive advantage. Due to the growing reliance on customers to participate in production, the relevance of this capability will only increase in the future.

## 4.10 APPENDIX: MEASUREMENT MODEL EVALUATION

### REFLECTIVE CONSTRUCTS

**Table A:** Loadings, unidimensionality, composite reliability and AVE

Constructs and indicators	Loadings
<b>Quantitative workload</b>	
I had to work really fast.	.83***
I had to work really hard to finish the installation(s) in time.	.88***
I had to do a great deal of work in a short time.	.94***
I had little time to get everything done.	.93***
I had an excessive amount of work to do.	.87***
I barely had enough time to finish everything.	.87***
$\lambda_1 = 4.73$ ; $\lambda_2 = .45$ ; $\rho_c = .96$ ; AVE = .79	
<b>Qualitative workload</b>	
Placing the installation(s) required a lot of concentration.	.71***
I had to work very precise.	.70**
I had to pay attention to a lot of things at once while placing the installation(s).	.76***
I constantly had to think while installing.	.88***
I constantly had to keep my mind on the installation work.	.83***
I had to remember a lot for placing the installation(s).	.77***
The placing of the installation(s) required great care.	.76***
$\lambda_1 = 4.29$ ; $\lambda_2 = .71$ ; $\rho_c = .91$ ; AVE = .60	
<b>Perceived organizational support</b>	
FIRM values me as a customer.	.88***
FIRM strongly considers my needs and wants.	.90***
FIRM would ignore any complaint from me. (r)	.70***
When I have a problem, help is always available.	.74***
FIRM really cares about my wellbeing.	.83***
FIRM cares about my opinion.	.85***
FIRM tries to provide the best service possible.	.88***
I am just another customer to FIRM. (r)	.73***
FIRM considers my best interests when it makes decisions that affect me.	.79***
FIRM cares about my general satisfaction.	.89***
FIRM is willing to help me when I have a special request.	.79***
If given the opportunity, FIRM would take advantage of me. (r)	.77***
FIRM shows great concern for me.	.84***
$\lambda_1 = 8.68$ ; $\lambda_2 = .72$ ; $\rho_c = .96$ ; AVE = .67	
<b>Experienced strain</b>	
Aspects of the installation were a source of frustration to me.	.81***
Placing the installation(s) often created a lot of stress.	.95***
I regularly experienced tension from the installation work.	.97***
I felt pressured while installing.	.90***
$\lambda_1 = 3.31$ ; $\lambda_2 = .44$ ; $\rho_c = .95$ ; AVE = .83	
<b>Absorption</b>	
I felt happy when I was working intensely on the installation(s).	.92***
I was completely immersed in the installation(s).	.65***
I got carried away when working.	.58***
$\lambda_1 = 1.73$ ; $\lambda_2 = .71$ ; $\rho_c = .76$ ; AVE = .53	

<b>Dedication</b>	
I was enthusiastic about placing the installation(s).	.93***
Placing the installation(s) inspired me.	.81***
I was proud of placing the installation(s) myself.	.83***
$\lambda_1 = 2.20; \lambda_2 = .54; \rho_c = .89; AVE = .73$	
<b>Vigour</b>	
While placing the installation(s), I felt bursting with energy.	.96***
While installing, I felt strong and vigorous.	.96***
When I got up in the morning, I felt like working on the installation(s).	.84***
$\lambda_1 = 2.54; \lambda_2 = .41; \rho_c = .94; AVE = .85$	
<b>In-role behaviour</b>	
During my contacts with FIRM,	
... I performed all required tasks properly.	.90***
... I met all requirements of FIRM.	.88***
... I adequately completed all expected behaviours.	.92***
... I fulfilled my responsibilities to FIRM correctly.	.90***
... I followed the directives and instructions from FIRM and their employees.	.72***
$\lambda_1 = 3.76; \lambda_2 = .61; \rho_c = .94; AVE = .75$	
<b>Extra-role behaviour – Word-of-mouth</b>	
How likely is it that you	
... would say positive things about FIRM to others?	.97***
... would recommend FIRM's DIY concept to others?	.99***
... would encourage friends and relatives to choose FIRM's DIY concept?	.98***
$\lambda_1 = 2.90; \lambda_2 = .08; \rho_c = .99; AVE = .97$	
<b>Extra-role behaviour – Feedback to firm</b>	
If I had a useful idea on how to improve FIRM's DIY concept, I would let an employee know.	.82***
If I received good service from an employee, I would comment about it.	.89***
If I experienced a problem, I let an employee know about it.	.56**
$\lambda_1 = 1.78; \lambda_2 = .87; \rho_c = .81; AVE = .59$	
<b>Customer experience</b>	
I have previous experience with installing ventilation/heating/plumbing.	.82***
I have previous experience with similar tasks.	.94***
I have previous experience with DIY (e.g., wallpapering, laying laminate, putting up blinds myself, ...).	.86***
$\lambda_1 = 2.29; \lambda_2 = .52; \rho_c = .91; AVE = .76$	
$\rho_c = \text{composite reliability}$	
* $p < .10$ ; ** $p < .05$ ; *** $p < .01$	

**Table B:** Discriminant validity – 1<sup>st</sup> stage HTMT criterion

	Absorption	Dedication	Vigour
Absorption			
Dedication	.85		
Vigour	.65	.86	

**Table C:** Discriminant validity – 2nd stage HTMT criterion

	1	2	3	4	5	6	7
1. Word-of-mouth							
2. Feedback to firm	.58						
3. In-role behaviour	.31	.56					
4. Organizational support	.81	.55	.29				
5. Qualitative workload	.15	.31	.17	.16			
6. Quantitative workload	.15	.27	.33	.34	.14		
7. Strain	.40	.20	.20	.42	.31	.40	

**FORMATIVE CONSTRUCTS****Table D:** Variance inflation factor (VIF)

	<b>VIF</b>
LV Absorption	2.23
LV Dedication	3.17
LV Vigour	2.19

**Table E:** Indicator loadings

<b>Engagement</b> (2 <sup>nd</sup> order)	<b>Loadings</b>
LV Absorption	.89***
LV Dedication	.92***
LV Vigour	.85***

\* $p < .10$ ; \*\* $p < .05$ ; \*\*\* $p < .01$

**Table F:** Discriminant validity for formative constructs

	<b>LVC</b>	<b>LVC – 2SE</b>	<b>LVC + 2SE</b>
Engagement - Word-of-mouth	.28	.12	.45
Engagement - Feedback to firm	.33	.16	.49
Engagement - In-role behaviour	.42	.26	.58
Engagement - Organizational support	.30	.14	.47
Engagement - Qualitative workload	.07	-.11	.24
Engagement - Quantitative workload	-.32	-.49	-.16
Engagement - Strain	-.42	-.58	-.26

$$SE = \frac{\sqrt{1-LVC^2}}{n-2}$$

n = Sample size = 133



**CHAPTER 5**  
**CONCLUSION AND FUTURE RESEARCH**

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## CHAPTER 5

### CONCLUSION AND FUTURE RESEARCH

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Co-production entails customers' active participation in the production (i.e., design, manufacturing and/or distribution) of the core offering (i.e., goods and services). In sharp contrast to the ubiquity of co-production formats in practice, academic understanding of what underlies profitable co-production strategies is relatively limited. Therefore, the overall aim of this doctoral dissertation was to **provide an enhanced insight in the drivers of mutual co-production success.**

To address this central research question, this dissertation developed an overarching framework describing three prominent challenges that firms encounter on their road to co-production success: attracting customers, fostering effective customer performance and stimulating continued co-production use (see Figure 17). Next, each of these challenges was translated in a research goal and empirically examined.

**Figure 17:** Key challenges on the road to co-production success



This final chapter provides an integrated overview of the empirical studies conducted in this doctoral research, structured according to the three co-production implementation challenges. Subsequently, based on the research results, a roadmap is provided to guide firms in the development of successful co-production initiatives. Finally, some interesting opportunities for future research on co-production are elaborated on.

## 5.1 SYNOPSIS OF FINDINGS

### 5.1.1 Attracting customers

A primary step on the road to co-production success is attracting customers. Consistent with the concept of customer value (Zeithaml, 1988), customers weigh the anticipated benefits of co-production against the expected costs and will only prefer to co-produce when the result of this evaluation is positive (Etgar, 2008). Additionally, considering the competitive marketplace, the firm's co-production initiative must provide more value than full-service alternatives and competing co-production options (Olsen, 2002).

Although existing literature repeatedly underscored the pivotal role of customer value for convincing customers to co-produce (e.g., Etgar, 2008; Jia et al., 2012; Rodie and Kleine, 2000), integrative empirical research in this area was lacking. In response to this gap in marketing literature, **Chapter 2** developed and empirically validated a comprehensive co-production value conceptualization via a three-phase (i.e., literature review, qualitative interviews and quantitative survey) and multi-stage (i.e., design, manufacturing and distribution) study.

From this conceptualization the following findings emerged. First, customers' intention to co-produce is a function of the benefits as well as the costs they expect from co-producing. Second, both co-production benefits and costs are multidimensional in nature. In particular, co-production benefits consist of the dimensions efficiency, excellence, play and social benefits, whereas co-production costs entail the dimensions economic risk, personal investment and social risk. Third, though the relevance of these value dimensions for customer attraction greatly differs, a remarkably stable pattern was evidenced across co-production stages. In each stage, play emerged as the most salient dimension of co-production value. The cost dimension economic risk was the runner up. Nonetheless, in the manufacturing and distribution stage, it shared its second rank with other value dimensions (i.e., efficiency, excellence and/or personal investment). The social value dimensions (i.e., social benefits and social risk) overall displayed the smallest effect on customers' co-production choice.

### 5.1.2 Fostering effective customer performance

Once customers have decided to use the co-production option, a second step to co-production success is ensuring customers' effective performance of their co-production role. This is essential as customers, by actively participating in the firm's production process, influence the co-production outcome, their own satisfaction and, ultimately, firm financial performance (Bettencourt et al., 2002). As mutually beneficial co-production requires highly proficient customers, there is a dire need to understand how firms can proactively shape customers' co-production performance.

Chapter 3 and Chapter 4 of this dissertation investigated how firms can bring customer performance under managerial control. Both chapters departed from the notion that customers, as co-producers, become partial employees of the firm and represent manageable human resources (Halbesleben & Buckley, 2004b).

Drawing on parallels between the organizational entry of new employees and customers assuming the role of co-producer, **Chapter 3** analyzed the link between customer socialization and customers' co-production quality contributions. Compared to employee and firm quality, customer quality forms the most variable and difficult to control co-production quality element (Groth, 2005; Halbesleben & Buckley, 2004b). Customers can contribute to co-production quality in two ways, via technical (i.e., what they contribute) and functional inputs (i.e., how they contribute) (Greer, 2015; Kelley et al., 1990). Customer socialization, in turn, can be captured by three related indicators: 1) role clarity (i.e., customers' understanding of what to do), 2) self-efficacy (i.e., their belief in their co-production abilities) and 3) motivation (i.e., their willingness to co-produce) (Bettencourt et al., 2002; Lengnick-Hall, 1996). Together, these indicators describe the extent to which customers feel prepared to take on their co-production role (Meuter et al., 2005). The findings of Chapter 3 provided empirical evidence for a positive effect of anticipatory socialization on customer quality. Customers' role clarity, self-efficacy as well as motivation impact their technical quality contributions. In contrast, only their co-production motivation significantly affects their functional quality contributions.

Building on the Job Demands-Resources model, **Chapter 4** added to our understanding of how to effectively manage customer performance by examining how co-production task design (i.e., task demands and resources) affects customer wellbeing and customer participative behaviours. The resulting Co-production Demands-Resources model included the effect of two co-production demands (i.e., quantitative and qualitative workload) and one co-production resource (i.e., perceived organizational support POS) on customers' wellbeing (i.e., experienced strain and task engagement) and, in turn, their in-role and extra-role behaviours (i.e., positive WOM and feedback provision). The findings provided empirical support for a task characteristics – customer wellbeing – participative behaviour chain of effects. Whereas customer experienced strain lowered WOM behaviour, co-production task engagement promoted customer in-role behaviour and feedback provision. Further, to influence customer strain and engagement, managing customers' co-production task perceptions is vital. However, the impact of task demands and resources on customer wellbeing exhibited an intricate and, in some instances, counterintuitive pattern.

First, as expected, both quantitative and qualitative workload heightened customer strain while POS decreased strain. Additionally, quantitative workload and experienced strain reduced task engagement. Yet, contrary to expectations, POS did not impact task engagement, while qualitative workload displayed a significant positive effect. Herzberg's (2003) two-factor theory can shed light on the former effect: paying customers may view POS as a hygiene factor, such that its presence does not improve engagement but its absence results in dissatisfaction. The latter effect can be explained by the nature of the task demands: qualitative workload acts as a challenge demand, while quantitative workload forms a hindrance demand (see Nahrgang et al., 2011). Hence, customers perceive quantitative workload to only impede their co-production work, while qualitative workload is considered to hinder as well as foster task accomplishment. Also surprisingly, instead of buffering the influence of quantitative workload on experienced strain, POS heightened this adverse effect. However, though statistically significant, this effect lacked practical significance, as indicated by its marginal effect size.

### 5.1.3 Stimulating continued co-production use

While customer attraction is a prerequisite for survival, long-term financial performance is driven by both customer attraction and customer retention (Rust et al., 2004; Wang et al., 2013). Thus, to implement a successful co-production initiative, firms also require insight in how they can stimulate customers' repeated co-production use.

The provision of a high-quality co-production experience, promoting customer satisfaction, is essential to stimulate customers' continued use of co-production formats (Ennew & Binks, 1999; Yim et al., 2012). Yet, current knowledge of co-production quality is limited and available empirical evidence is only piecewise in nature. To gain insight in the role of co-production quality for promoting continued use, **Chapter 4** developed and empirically tested a comprehensive co-production quality typology. First, this typology explicitly takes into account the different participants in the production process: the customer, the firm and its employees. Second, it distinguishes the various ways in which these participants contribute to quality: via technical (i.e., what they do) and functional (i.e., how they do it) inputs.

Overall, the co-production quality typology was supported as the six quality elements were well capable of predicting co-production satisfaction, in terms of process and outcome, and customers' ongoing usage, in terms of firm repurchase and future co-production intentions. Technical quality contributions of each co-production participant (i.e., customer, firm and employee) positively influenced customer satisfaction with the co-production outcome. In contrast, only employee and firm functional quality significantly affected process satisfaction. Turning to the satisfaction-continued use relationship, the evidence indicated a distinct impact of outcome and process satisfaction: process satisfaction impacted both continued use intentions, whereas outcome satisfaction merely influenced customers' future co-production intent.

## **5.2 A ROADMAP TO CO-PRODUCTION SUCCESS**

Co-production strategies hold the promise of great advantages for both the customer and the firm. However, on their road to profitable co-production, firms come across three key challenges: attracting sufficient customers, fostering effective customer performance and stimulating continued customer use. This dissertation aids firms in overcoming these challenges and provides a roadmap to guide them on their journey to mutual co-production success (see Figure 18).

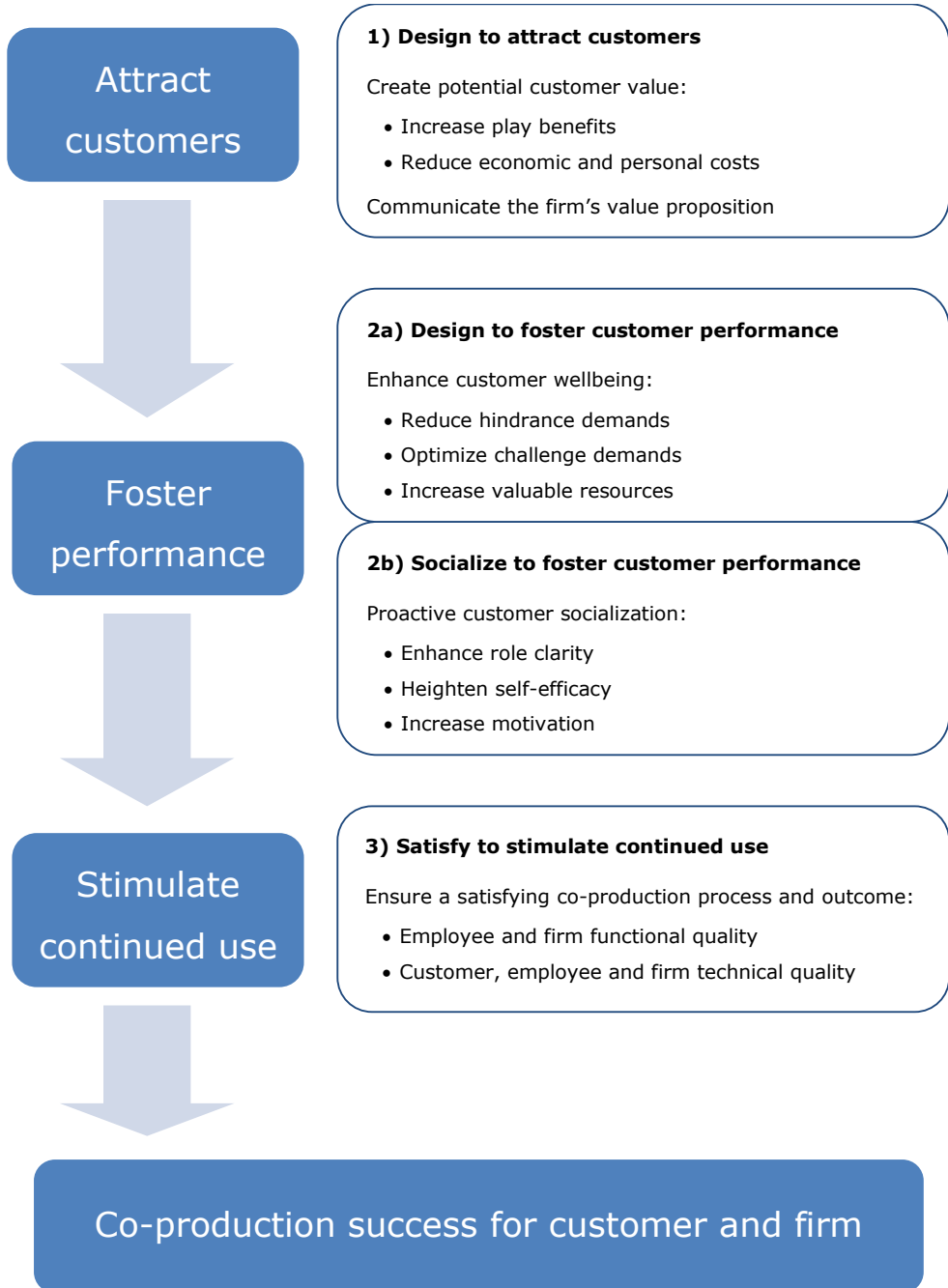
### **5.2.1 Design to attract customers**

Instead of rapidly developing a co-production option to save costs, firms must design the co-production activity with customer value in mind to differentiate themselves from the competition and optimize customer attraction. Several practical directives regarding the effective allocation of firm resources to co-production design and promotion emerged from the empirical study in **Chapter 2**.

A prime advice for firms is to put some fun in their co-production initiatives. The intrinsic enjoyment expected from the co-production experience is what primarily drives customers to opt for a co-production activity. Interestingly, this finding holds in the design, manufacturing and distribution stages of co-production. Hence, firms must strongly consider possibilities to enhance customers' play benefits when designing new co-production options or redesigning existing ones. For instance, DIY Auto Repair Shops offers their customers a climate controlled working environment, cable TV, free Wi-Fi, a lounge area and beverages and snacks. Or, several shoe manufacturers are experimenting with hologram technology such that customers, via kiosks in retail stores, can design their own shoes and immediately see the result of their design choices projected as a 3D hologram. Additionally, adding a game element to the co-production experience or offering the opportunity to share the co-produced outcome with friends (e.g., via social media) can facilitate play benefits (Hamari, Koivisto, & Sarsa, 2014; Raftopoulos, Walz, & Greuter, 2015).



**Figure 18:** A roadmap to co-production success



Besides play, efficiency and excellence benefits are relevant in customers' co-production decision as they represent qualifying factors. Firms can, for instance, award customers a price reduction, time savings or create possibilities to customize the offering. An online customer community, supporting the exchange of advice for personalising standard offerings, forms an efficient way of improving customization opportunities (e.g., [IKEAhackers.com](http://IKEAhackers.com)) (Haumann et al., 2015).

Another relevant guideline concerns the costs customers expect from co-production. Though benefits encourage customers to co-produce, managers must not neglect co-production costs as these form considerable barriers to customers' adoption of a firm's co-production initiative. Especially economic risk and personal investment, comprising customers' effort exertion and the fear that something could go wrong, inhibit customers to take on a co-production role. Thus, in the development of co-production initiatives, managers should look for ways to efficiently lower these costs, while preserving the beneficial aspects of the co-production option. Firms could provide clear and easy to understand customer instructions in order to reduce time and effort costs. Firms can also assure the availability of an employee to offer real-time support or answer customer questions, through an information desk, a service hotline or a live chat. For instance, in the Netherlands, DIY chain Gamma is testing an online chat service to respond to customer inquiries (Libbenga, 2015). Similarly, retailer As Adventure provides a help chat for customers of its web shop ([www.asadventure.com](http://www.asadventure.com)).

The actions taken to facilitate customer value should also be explicitly communicated to the customer. Firms cannot expect customers to simply know the gains they can derive from co-producing (Bowen, 1986). Via marketing campaigns, firms can help customers recognize the value they can create by using the firm's co-production initiative (Haumann et al., 2015; Jia et al., 2012). As such, managers should carefully devise an integrative communication strategy and enticing value proposition to proactively shape customers' co-production value expectations and attract sufficient customers to their co-production initiative (Ballantyne et al., 2011). Following our findings, in their

communication efforts, firms should not only promote utilitarian benefits but emphasize the potential enjoyment and fulfilment customers can derive from co-producing the offering. The cost-reducing actions (e.g., available employee support) should also be included in the firms' communications towards the customer in order to reduce the anticipated co-production costs and, thus, stimulate customers to co-produce. However, firms need to be careful to communicate the right expectations. Higher value expectations might attract more customers but if the actual co-production experience cannot fulfil these expectations, customers become dissatisfied, resulting in a detrimental effect on firm profitability in the long-run (Oliver, 1997).

### **5.2.2 Design to foster effective customer performance**

Besides creating (potential) customer value to attract customers, sensible co-production task design can enhance customers' wellbeing and, subsequently, foster their co-production performance (i.e., in-role and extra-role participative behaviours). Multiple recommendations for the effective management of co-producing customers follow from the research in **Chapter 4**.

As managers cannot directly influence customer wellbeing, they must proactively control co-production task demands and resources by means of integrated organizational plans. Specifically, firms should formulate concrete actions to reduce hindrance demands as these demonstrate an adverse effect on both customer experienced strain and task engagement. Since Chapter 4 identified quantitative workload as a hindrance demand, heightening strain and decreasing engagement, co-production firms need to thoroughly evaluate the amount of production work they transfer to customers and examine ways to reduce quantitative pressures on customers.

Further, as they have a positive as well as negative impact on customer wellbeing, firms must try to optimize challenge demands (e.g., qualitative workload). Challenge demands should not be too low as they improve task engagement, however, they also must not be too high as they increase customer strain. The co-production task should be challenging but achievable for customers. A first option is to target a particular customer segment. For

example, a firm can sell a car building kit and specifically aim it at experienced do-it-yourselfers. Another possibility is to build varying difficulty levels into the co-production offering and let customers self-select the desired alternative. For instance, the travel agency from Chapter 2 might offer multiple options: 1) full-service delivery, 2) large building blocks to design a trip (e.g., a 2-day LA tour pack) and 3) full self-design.

Since adjusting demands is not always feasible or economically desirable, managers need to think of alternate strategies to protect customers' wellbeing and, in turn, their participative behaviours. One option for firms is to increase the resources they currently provide to their customers. Task resources (e.g., perceived organizational support) exert an overall positive influence on customers' co-production performance. They can directly stimulate customer wellbeing and performance as well as prevent or reduce the detrimental effects of task demands. Besides improving available resources, firms can create new resources that are valuable to their customers. For instance, managers can develop a customer training program or set up a system of regular performance feedback.

Instead of actually modifying the co-production task, firms can also aim to alter customers' beliefs. In addition to influencing customers' value expectations, well thought-out marketing communications can reshape customers' perceptions of co-production task demands and resources. For instance, when reducing a hindrance demand is not feasible, firms can attempt to induce a revaluation from hindrance to challenge demand (Babakus et al., 2009). Furthermore, firms can aim to change the effect of task demands and resources on customers' wellbeing. For instance, communicating support-service options (e.g., an online chat) might lower customers' risk perceptions, a substantial co-production cost, as well as mitigate the detrimental effect of quantitative task demands (Haumann et al., 2015).

Practically, before adjusting the co-production task, effective co-production design requires a sound assessment of which task characteristics customers view as hindrance demands, which as challenge demands and which as

resources. This can be achieved via an easy customer survey (see Chapter 4's Appendix for an example).

### **5.2.3 Socialize to foster effective customer performance**

Once customers have chosen to co-produce, firms need to make sure these customers are adequately socialized before or at the beginning of the co-production task as this affects customer contributions to co-production quality. Hence, following the findings of **Chapter 3**, proactive socialization aids firms in overcoming the second key challenge of fostering customer performance. Customers must understand their responsibilities and duties, have sufficient confidence in their capabilities and be motivated to effectively fulfil the co-production task. Managers should thus devise organizational programmes to develop the level of role clarity, self-efficacy and motivation necessary for high-quality customer contributions to co-production.

For instance, firms can offer lessons where customers can practice required production tasks in order to acquire relevant experience and gain personal co-production accomplishments (Bandura, 1997). This enactive mastery experience not only raises role clarity but also forms the strongest source of self-efficacy (Ford & Dickson, 2012). Furthermore, firms can provide comprehensible and truthful task previews, step by step explaining the production activities that customers have to carry out. This can be done via elaborate how-to-guides, online tutorials or videos of other customers carrying out the required actions (Yim et al., 2012). Next to cultivating role clarity, these videos may strengthen customers' self-efficacy through vicarious modelling, since customers gain more confidence in their skills when they see someone similar succeeding (Bandura, 1977). Finally, to promote customer motivation, firms should explicitly state the benefits customers gain by co-producing (e.g., fun, a price reduction and added customization) and convince customers of the importance of their own quality contributions for a satisfying co-production experience. This further reinforces the relevance of well thought-out communication strategies for achieving co-production success.

#### **5.2.4 Satisfy to stimulate continued co-production use**

Overcoming the last challenge, stimulating continued use, is essential to ensure co-production success in the long-term. According to **Chapter 3**, firms must assure the provision of a satisfactory co-production experience to foster ongoing customer usage. To achieve this, firms should acknowledge and track the different inputs of each participant in the production process as they all contribute to the quality of the co-production experience and, in turn, co-production satisfaction. Thus, managers should not only focus on enhancing employee and firm quality, but also pay adequate attention to customer quality contributions. Especially as customer inputs are unpredictable and variable in nature. In this respect, the previous sections offered multiple suggestions for enhancing customers' co-production performance via co-production task design and anticipatory socialization.

When attempting to strategically improve the different co-production quality aspects, managers must consider the entire nomological web, since not only do the quality facets have a distinct impact on outcome and process satisfaction, these latter constructs also differentially affect ongoing use. As customer satisfaction with the co-production process drives customer retention, managers must especially oversee the provision of a satisfying process to create a loyal customer base. Based on the results, this can be achieved by ensuring high-quality firm and employee functional inputs. Thus, reliable and friendly employee behaviours, and trouble-free firm procedures (e.g., delivery and invoice processes) are vital.

Nonetheless, firms should not neglect outcome satisfaction, since an acceptable outcome likely is a prerequisite for customers to consider purchasing from the same firm again. Additionally, outcome satisfaction determines customers' future intentions to engage in co-production and as such can indirectly benefit firms by stimulating customers' general co-production propensity. To raise outcome satisfaction, firms need to manage the technical quality contributions of each co-production participant. Hence, the customer and employee should be sufficiently knowledgeable, share necessary information and exert enough effort while the firm must assure quality input materials.

### **5.2.5 Conclusion**

The roadmap developed in this doctoral dissertation opens up the way to co-production success for the firm and its customers. It offers firms a stepwise guide to lead them through the design, implementation and management of co-production initiatives by helping them overcome three key challenges: attracting customers, fostering effective customer performance and stimulating continued co-production use. According to the provided roadmap, firms must design and communicate their co-production initiative with customer value and wellbeing in mind, ensure customer readiness through anticipatory socialization and provide a satisfying co-production experience via participant's high-quality contributions. The destination? A win-win situation in which both the customer and the firm gain from engaging in co-production.

## **5.3 OPPORTUNITIES FOR FUTURE RESEARCH**

Though this doctoral dissertation takes our knowledge on the drivers of reciprocal co-production success a step further, many interesting research avenues remain open. Therefore, in addition to the directions for future research provided at the end of each chapter, this final section indicates some general suggestions for further research in the field of co-production.

### **5.3.1 The moderating role of customer characteristics**

THE customer does not exist. Considerable heterogeneity prevails between customers based on their personal characteristics (Yi & Gong, 2008). These personal characteristics exert an influence on an individual's evaluation and decision processes. This way, they can substantially alter a person's perceptions, attitudes and behaviours (Weijters et al., 2007). Especially the moderating role of these customer characteristics merits further attention as this delineates relevant boundary conditions for successful co-production (Dabholkar & Bagozzi, 2002; Yim et al., 2012). Knowledge of these moderation effects provides a more nuanced picture of the co-production experience and results in more detailed managerial guidelines. Hence, the potentially moderating influence of customer characteristics in co-production forms a first promising research avenue. Of

specific interest are state-based characteristics (e.g., self-efficacy, involvement, regulatory focus and optimism) as these, compared to enduring trait-like factors, represent actionable characteristics that firms can (pro)actively elicit via intentionally designed marketing tools and campaigns (Jia et al., 2012; Meuter et al., 2005).

For instance, as value is personal, the same offering can induce different value types for different perceivers (Holbrook, 1996). Individual characteristics could change the (relative) impact of the benefit and cost dimensions on customers' intentions to co-produce. In Chapter 2, across co-production stages, play and economic risk displayed the largest effect, efficiency, excellence and personal investment exhibited a moderate influence, and the social value dimensions showed the smallest impact on customers' co-production choice. However, this rank order might shift as different value dimensions may become more or less salient depending on the customer's specific characteristics. For instance, a low self-efficacy might attenuate the effect of play on customers' co-production decisions while strengthening the influence of ease of use-related value elements (Dabholkar & Bagozzi, 2002). This kind of information can provide firms more specific recommendations on how to (re)design and promote their co-production options for different customer segments.

Furthermore, the effect of the various co-production quality elements on customer satisfaction with the co-production process and outcome, assessed in Chapter 3, might be altered. Besides representing a significant antecedent of customer co-production quality, self-efficacy could, for example, modify the effect of the co-production quality dimensions on customer satisfaction (Yi & Gong, 2008). Also, the relationships in the Co-production Demands-Resources model of Chapter 4 may be affected by customers' individual characteristics. Optimism, self-esteem and self-efficacy, among others, could impact the relationship between task characteristics (i.e., demands and resources) and an individual's wellbeing (Schaufeli & Taris, 2014; Xanthopoulou, Bakker, Demerouti, & Schaufeli, 2007). For instance, according to Bandura (1986), high self-efficacy individuals view difficult goal pursuits as challenges, whereas people low in self-efficacy perceive them as hindrances.



A more profound insight in the above moderating relationships offers managers more thorough advice on how to design, implement and manage the co-production task to achieve customer attraction, performance development and retention. In particular, self-efficacy or a person's belief in his/her capabilities to effectively perform the required tasks forms an interesting research opportunity as co-production creates new roles and responsibilities for customers.

### **5.3.2 The financial consequences of fostering customer co-production performance**

This doctoral dissertation essentially examines how the implementation of a co-production option affects the benefit side of a firm's financial value equation. Chapter 3 indicates that better customer performance increases customers' satisfaction with the co-production experience. This improvement in customer evaluations ultimately drives firm's business performance (Rust & Zahorik, 1993; Zeithaml et al., 1996). Following Rust et al. (2004), favourable customer judgments increase customer attraction and/or retention and, in turn, enhance customer lifetime value and customer equity.

Together with Chapter 4, Chapter 3 also offers several practical directives on how to enhance customer performance and, thus, eventually firm performance. Firms should proactively socialize their customers and design co-production tasks for enhanced customer wellbeing. However, adequate customer socialization and deliberate co-production task design generate incremental expenditures for the firm. To determine the desirability of this investment in customer co-production performance, next to the benefit function, firms must factor in the costs and calculate the expected return on investment.

According to Halbesleben and Buckley (2004), the improvement of customer performance can be a cost-effective way for firms to heighten customers' evaluations of a co-production initiative. However, the return on customer performance investment depends on customer and task variables such as customers' learning curve, the rate of customer churn, customers' usage frequency of the co-production option and the length of the co-production task (Hilton, 2008). For instance, higher customer churn leads to a rise in customer

training and development costs. Further, following Mills and Morris (1986), anticipatory socialization activities (e.g., a manual or course on installing ventilation) without purchase obligation involve a certain risk in competitive markets. If the customer, after the socialization activity, opts for a competing co-production initiative, the firm bears the socialization costs while the competitor acquires the gains.

Unfortunately, empirical research on these issues is lacking. Whether or under what circumstances investments in improving customers' co-production performance provide an adequate return on investment remains unclear. A fruitful avenue for future research, therefore, comprises the empirical assessment of the financial consequences of stimulating customers' co-production performance.

### **5.3.3 An employee perspective on co-production**

The focus of this dissertation lies on unravelling the drivers of successful co-production, where success is defined as beneficial to the customer and the firm. Nonetheless, as evidenced in Chapter 3, the employees of a firm also play a crucial role in many co-production initiatives. When part of the co-production process, employees greatly affect customers' evaluations of the co-production initiative. Their conduct and manners substantially affect customers' co-production experience and subsequent behaviours.

Unfortunately, this employee influence is not necessarily favourable. As production tasks previously performed by an employee are transferred to the customer, co-production does not only change the customer's role, it also alters the role of the employee (Etgar, 2008; Groth, 2005; Hilton et al., 2013). Employees become coaches or consultants, providing training and support to customers, or they have to take on other, novel tasks. For instance, when customers order their groceries online (e.g., Delhaize E-shop and Colruyt Collect&Go), a new employee task is product selection (Hilton, 2008). This changed role can have a beneficial as well as a detrimental impact on the employee and his performance. On the positive side, customers' active participation can create relational value and an enjoyable experience (Chan et

al., 2010; Yim et al., 2012). On the other hand, increased customer participation can heighten employees' job stress and reduce their job satisfaction (Chan et al., 2010; Hsieh & Yen, 2005). Additionally, a fear of job loss, following the introduction of co-production, may lower employee morale and satisfaction (Verhoef et al., 2009). Consequently, co-production may induce positive or negative employee behaviour and, as such, enhance or detract from the customers' experience itself.

To date, research on the perceptions of and effects on employees of co-production is virtually nonexistent. Nonetheless, incorporating the employee's interests can further extend the mutual beneficial nature of co-production. As such, it is interesting to also investigate the co-production experience from an employee perspective. Complementary to the study in Chapter 1, investigating the customer value of co-production, future studies could examine co-production value from the viewpoint of the employee. Positive value likely stimulates supportive behaviours, while negative perceived value might cause employees to oppose the co-production initiative. Hence, managers must understand the benefits as well as the costs employees associate with the introduction of co-production and their new role herein.

Furthermore, parallel to Chapter 4, future research could assess how to design the co-production task to promote participative employee behaviours. Since extant literature reports a link between customer participation and job stress (Hsieh & Yen, 2005), specific co-production task demands and resources might distinctly affect employees' wellbeing (i.e., experienced strain and job engagement) and, in turn, their in-role and extra-role behaviours.

### **5.3.4 Value co-creation opportunities in co-production**

Chapter 1 explained the difference between co-production and value co-creation: co-production refers to customers' active participation in the firm's production process, whereas value co-creation comprises the firm's active participation in customers' value creation processes through direct interactions (Grönroos, 2011). Notwithstanding, during co-production, direct customer-firm interactions may also take place and possibilities for co-creation of value occur

(Grönroos & Voima, 2013). For example, by organizing workshops on how to install ventilation yourself, the DIY firm, forming the setting of the studies in Chapter 3 and Chapter 4, can interact directly with its customers and generate value co-creation opportunities.

This dissertation did not consider these value co-creation opportunities. However, Grönroos and colleagues (Grönroos & Ravald, 2011; Grönroos & Voima, 2013; Grönroos, 2011) put forward value co-creation as a key issue for both academics and practitioners, since it creates possibilities for firms to move from only offering value propositions to actively impacting the customer's process of value fulfilment. Thus, besides being a value facilitator, the firm becomes a co-creator of value. Further, while co-production can generate a win-win situation for the firm and the customer (Bendapudi & Leone, 2003), according to the co-creation paradigm (Ramaswamy & Ozcan, 2014), value co-creation opens up possibilities for a win more – win more situation. As this assertion lacks empirical validation, future research could examine the possibilities for value co-creation during co-production as well as how this affects the attraction, performance and retention of customers and the firm's business performance.

Value co-creation can impact the customer value of co-production, as examined in Chapter 2, and consequently customers' decision to co-produce. Co-creation opens up novel sources of mutual value and expands the value creation pie for the customer and the firm (Ramaswamy & Gouillart, 2010; Ramaswamy, 2009). As such, when firms foster direct interactions during co-production and act upon these value co-creation opportunities, different or additional customer value dimensions may become salient. For instance, if travel agents provide customers the option to discuss their travel planning ideas with in-house experts or fellow travel enthusiasts when designing a trip themselves, other value elements might play a role.

Furthermore, during direct interactions, firms have the possibility to affect the value creation processes of the customer (Grönroos & Ravald, 2011). The quality of these interactions determines whether value is co-created or co-destroyed

(Grönroos & Voima, 2013). Chapter 3 touched lightly on the issue of interaction quality by studying the influence of customer, employee and firm functional quality on co-production process satisfaction. However, more extensive research, through a value co-creation lens, of how the interaction processes affect customers' co-production experience is warranted. In addition, the interactions between customers, such as on a firm-hosted forum (e.g., NIKE+), should be considered when examining value co-creation in a co-production setting. Moreover, in line with the previous suggestion for further research, the impact of value co-creation on employees and their behaviours could be considered.

As the above research opportunities indicate, the field of co-production is still advancing and further research is needed to fulfil co-production's promise as the next frontier in competitive effectiveness.



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