

# **Modelling Co-creation and its Consequences: One Step Closer to Customer-centric Marketing**

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# Table of Contents

ATTESTATION OF AUTHORSHIP	XVIII
ACKNOWLEDGEMENTS	XIX
ABSTRACT	XX
CHAPTER 1: INTRODUCTION TO RESEARCH PROBLEM	1
1.1 Introduction.....	1
1.2 Background to the research.....	2
1.2.1 Meaning of co-creation .....	2
1.2.2 Relevance of co-creation.....	4
1.3 Co-creation contexts for study .....	5
1.4 Research model, aims and preliminary research questions .....	7
1.5 Methodology .....	8
1.6 Outline of thesis .....	11
1.6.1 Chapter 1 Introduction to research problem.....	11
1.6.2 Chapter 2 Literature review .....	11
1.6.3 Chapter 3 Overall research design .....	12
1.6.4 Chapter 4 Pilot study - research design, analysis and discussion .....	13
1.6.5 Chapter 5 Main study research design .....	13
1.6.6 Chapter 6 Main study findings.....	14
1.6.7 Chapter 7 Discussion of findings, study contributions & future research ....	15
1.7 Study contributions .....	15

1.7.1 Marketing theory .....	15
1.7.2 Managerial practice .....	16
1.8 Chapter conclusion .....	17
CHAPTER 2: LITERATURE REVIEW .....	18
2.1 Introduction.....	18
2.2 Research questions.....	19
2.3 Underlying theoretical logic for co-creation.....	20
2.4 Modelling co-creation and its outcomes .....	25
2.4.1 Synthesising a definition of co-creation.....	27
2.4.2 A research model of co-creation and its outcomes .....	33
2.4.3 Co-creation & satisfaction.....	34
2.4.4 Co-creation & trust.....	36
2.4.5 Co-creation & relationship strength .....	37
2.4.6 Trust & relationship strength .....	39
2.4.7 Satisfaction & relationship strength .....	40
2.4.8 Trust and attitudinal loyalty .....	41
2.4.9 Satisfaction and attitudinal loyalty.....	42
2.4.10 Satisfaction and trust .....	43
2.4.11 Satisfaction and behavioural loyalty .....	44
2.4.12 Relationship strength & attitudinal loyalty .....	45
2.4.13 Attitudinal loyalty & behavioural loyalty .....	48
2.3.14 Investigating co-creation in multiple business contexts.....	49

2.5	Chapter conclusion .....	51
CHAPTER 3: OVERALL RESEARCH DESIGN		52
3.1	Introduction.....	52
3.2	Overall research design.....	53
3.3	Methods and procedures .....	56
3.3.1	Quasi-experimental research design .....	56
3.3.2	Sampling .....	58
3.3.3	Experimental materials & procedures .....	59
3.3.4	Analytical methods.....	60
3.4	Chapter conclusion .....	61
CHAPTER FOUR: PILOT STUDY		62
4.1	Introduction.....	62
4.2	Pilot study research aim and hypotheses .....	63
4.3	Pilot study research design .....	64
4.3.1	Quasi-experimental research design .....	64
4.3.2	Sample.....	64
4.3.3	Materials, measurement scales and procedures .....	65
	Materials.....	65
	Procedure.....	68
	Measurement scales.....	68
4.3.4	Analytical Methods .....	71
4.4	Preliminary data screening for multivariate analysis.....	72

4.4.1	Checking normal distributions .....	72
4.4.2	Reliability analysis .....	73
4.5	Measurement models .....	75
4.6	Structural model.....	80
4.7	Linking findings to research hypotheses .....	82
4.8	Discussion.....	83
4.8.1	Implications for theory .....	83
4.8.2	Implications for the main study.....	83
4.9	Chapter conclusion .....	85
CHAPTER 5: RESEARCH DESIGN FOR MAIN STUDY .....		86
5.0	Introduction.....	86
5.1	Recommended improvements from results of pilot study .....	87
5.2	Research question and hypotheses.....	88
5.2.1	Research questions .....	88
5.2.2	Research hypotheses .....	90
5.3	Quasi-experimental research design .....	90
5.4	Sample .....	92
5.4.1	Sampling plan.....	92
5.4.1	Unit of analysis .....	94
5.5	Experimental materials and procedures .....	95
5.5.1	Experimental materials.....	95
5.5.2	Experimental procedures.....	100

5.5.3	Manipulation checks .....	100
5.5.4	Sequence of scale items .....	101
5.6	Measurement scales .....	101
5.6.1	Multi-items measurement scales .....	103
5.6.2	Construct definitions .....	107
5.6.3	Listing of measurement scale items for constructs .....	114
5.7	Reliability.....	120
5.7.1	Reliability for experimental scenarios .....	121
5.7.2	Reliability in measurement scale items.....	121
5.8	Validity .....	122
5.8.1	Statistical inference validity .....	123
5.8.2	Internal validity in survey questionnaire.....	124
	Pre-testing survey questionnaire (measurement scales).....	124
	Post-data collection checks for internal validity .....	125
5.8.3	Internal validity in experimental scenarios .....	126
	Pre-testing of the experimental scenarios.....	126
5.8.4	External validity - experimental scenarios .....	127
5.9	Analytical methods .....	128
5.10	Ethics .....	129
5.11	Chapter conclusion .....	129
CHAPTER 6: MAIN STUDY DATA ANALYSIS		130
6.1	Introduction.....	130

6.2	Descriptive analysis .....	131
6.2.1	Data collection .....	131
6.2.2	Response rate .....	131
6.2.3	Profile of participants .....	132
6.3	Preliminary data screening.....	135
6.3.1	Testing normal distribution assumption.....	135
6.3.2	Testing homogeneity of variance assumption.....	136
6.3.3	Outlier assessment.....	137
6.4	Preliminary multivariate analysis .....	138
6.4.1	Exploratory factor analysis .....	138
6.4.2	Assessing reliability .....	142
6.4.3	Screening for multicollinearity .....	143
6.5	Measurement model.....	146
6.5.1	Iteration 1 - measurement model 1 .....	151
6.5.2	Iteration 2 - measurement model 2.....	154
6.5.3	Iteration 3 - Measurement model 3 .....	157
6.5.4	Final list of purified measurement scale items for constructs.....	159
6.5.5	Adequacy of measurement model .....	160
	Reliability .....	160
	Convergent validity .....	161
	Discriminant validity .....	164
6.6	Structural model.....	165

6.7	Multi-group invariance analysis .....	168
6.7.1	Preparatory steps prior to multi-groups invariance testing (MGIT) .....	168
6.7.2	MGIT procedure for B2B /B2C market co-creation contexts.....	168
6.7.3	MGIT- the effects of market contexts (B2B v B2C) on co-creation.....	169
6.7.4	MGIT procedure for product and service co-creation contexts .....	175
6.8	Linking findings to research hypotheses .....	180
6.9	Chapter conclusions .....	183
CHAPTER 7: DISCUSSION OF RESULTS .....		184
7.0	Introduction.....	184
7.1	Discussion.....	184
7.1.1	Measurement model .....	184
7.1.2	Structural model .....	185
7.1.3	Comparing B2B and B2C market contexts.....	192
7.1.4	Comparing product and service contexts .....	193
7.1.5	Post-hoc analysis of structural model .....	197
	Co-creation in transactional and relational situations .....	197
	Post-hoc analyses on structural paths not in theoretical model.....	199
7.2	Marketing theory contributions .....	200
7.2.1	Major contributions.....	200
	Co-creation and marketing outcomes.....	200
	Effects of market contexts.....	201
	Effects of product and service contexts.....	202



7.2.2	Subsidiary contributions.....	202
	Operational definition of co-creation .....	202
	Co-creation measurement scale.....	203
	Positivist research design .....	203
	Importance of external resource .....	204
7.3	Implications for managerial practice .....	204
	Operationalising co-creation in the business process.....	204
	Operationalising co-creation in B2B and B2C market contexts .....	205
	Operationalising co-creation in product and service contexts.....	205
7.4	Opportunities for further research.....	207
7.4.1	Opportunities derived from research design limitations .....	207
7.4.2	Extension opportunities derived from results of research.....	209
7.5	Thesis conclusion.....	211
	REFERENCES .....	212
	APPENDICES .....	225

## List of Figures

Figure 1.1 Preliminary research model .....	8
Figure 2.1 Theoretical model of co-creation and its outcomes .....	26
Figure 2.2 Co-creation and satisfaction .....	34
Figure 2.3 Co-creation and trust .....	36
Figure 2.4 Co-creation and relationship strength .....	37
Figure 2.5 Trust and relationship strength .....	39
Figure 2.6 Satisfaction and relationship strength .....	40
Figure 2.7 Trust and attitudinal loyalty .....	41
Figure 2.8 Satisfaction and attitudinal loyalty .....	42
Figure 2.9 Satisfaction and trust .....	43
Figure 2.10 Satisfaction and behavioural loyalty .....	44
Figure 2.11 Relationship strength and attitudinal loyalty .....	45
Figure 2.12 Attitudinal loyalty and behavioural loyalty .....	48
Figure 4.1 Pilot study research model .....	63
Figure 4.2 Pilot study revised conceptual model .....	75
Figure 4.3 Measurement model for co-creation, trust and satisfaction constructs .....	77
Figure 4.4 Measurement model for relationship strength and loyalty constructs .....	78
Figure 4.5 Structural model with standardised estimates .....	81
Figure 4.6 Structural model and hypotheses testing results .....	82
Figure 5.1 Main study research model .....	89

Figure 5.2 Contexts of experimental scenarios .....	95
Figure 5.3 Reflective and formative measurement indicators .....	104
Figure 6.1 Iteration 1 – measurement model 1 .....	152
Figure 6.2 Iteration 2 - measurement model 2 .....	154
Figure 6.3 Iteration 3 - measurement model 3 .....	157
Figure 6.4 Structural model with standardised parameter estimates and t-values .....	167
Figure 6.5 Research hypotheses .....	181
Figure 7.1 Structural paths with regression estimates for overall structural model...	186
Figure 7.2 MGIA structural estimates for B2B & B2C market contexts.....	192
Figure 7.3 MGIA structural estimates for service & product co-creation .....	193
Figure 7.4 Post-hoc analyses - identifying transactional and relational co-creation .	197
Figure 7.5 Post-hoc analyses of structural paths .....	199

## List of Tables

Table 1.1 Chapter 1 outline .....	1
Table 1.2 Preliminary research questions .....	8
Table 2.1 Chapter 2 outline .....	18
Table 2.2 Theoretical and conceptual logic for co-creation.....	21
Table 2.3 Co-creation definition descriptions .....	28
Table 3.1 Chapter 3 outline .....	52
Table 3.2 Guidelines for choice of research design for study .....	55
Table 3.3 Quasi-experimental research design for pilot and main study .....	57
Table 3.4 Sampling frame .....	58
Table 3.5 Experimental materials .....	59
Table 3.6 Methods and procedures for pilot study & main study .....	60
Table 4.1 Chapter 4 outline .....	62
Table 4.2 Pilot study research hypotheses .....	63
Table 4.3 High co-creation experimental treatment.....	66
Table 4.4 Moderate co-creation experimental treatment .....	67
Table 4.5 Low co-creation experimental treatment .....	68
Table 4.6 Measurement scales items for constructs in the pilot study.....	70
Table 4.7 Reliability statistics .....	73
Table 4.8 Pilot study revised research hypotheses.....	74
Table 4.9 Measurement model fit statistics.....	76

Table 4.10 Selected criteria to assess SEM model fit .....	76
Table 4.11 CFA for latent variables measurement model 1 – regression weights.....	79
Table 4.12 CFA for latent variables model 2 – regression weights .....	79
Table 4.13 Pilot study hypotheses testing results.....	82
Table 5.1 Chapter outline .....	86
Table 5.2 Research questions .....	89
Table 5.3 Research hypotheses .....	90
Table 5.4 Features of experimental research design .....	91
Table 5.5 Sampling plan .....	92
Table 5.6 Combination pairs of experimental scenarios .....	96
Table 5.7 Experimental scenario combinations1 .....	96
Table 5.8 (a) Experimental scenario combinations 1 .....	97
Table 5.8 (b) Experimental scenario combinations 2.....	97
Table 5.8 (c) Scenario combination 3 .....	97
Table 5.8 (d) Experimental scenario combinations 4.....	97
Table 5.9A Main study - B2C high co-creation product scenario .....	98
Table 5.9B Main study B2C moderate co-creation product scenario .....	99
Table 5.9C Main study2 B2C low co-creation product scenario .....	99
Table 5.10 Procedure for developing measurement scales .....	102
Table 5.11 Characteristics of reflective and formative measurement indicators .....	105
Table 5.12 Construct definitions .....	107
Table 5.13 Synthesising operational definition of co-creation .....	108

Table 5.14A Scale items for the co-creation construct .....	115
Table 5.14B Scale items for the relationship strength construct.....	116
Table 5.14C Scale items for trust & satisfaction constructs .....	117
Table 5.14D Scale items for attitudinal and behavioral loyalty constructs.....	118
Table 5.15 Procedures to establish reliability .....	120
Table 5.16 Procedures to establish construct validity .....	122
Table 6.1 Chapter 6 outline .....	130
Table 6.2 Gender of participants .....	132
Table 6.3 Age groups of participants .....	132
Table 6.4 Management levels of participants .....	132
Table 6.5: Number of years of work experience of participants.....	133
Table 6.6 Education level of participants.....	133
Table 6.7 Employment sector of participant .....	134
Table 6.8 Testing homogeneity of variance .....	137
Table 6.9 EFA - Iteration 1 eigenvalues and total variance explained .....	139
Table 6.10: Analysis of construct items with multiple cross-loadings .....	140
Table 6.11 EFA iteration 2 eigenvalues and total variance explained.....	142
Table 6.12 Reliability statistics .....	143
Table 6.13 Bivariate correlations of measurement scale item for constructs .....	145
Table 6.14(a) Summary of three iterations to generate final measurement model .	148
Table 6.14(b) Measurement models – Goodness of fit statistics for CFA .....	150
Table 6.15 Selected SEM criteria and thresholds to evaluate model fit .....	151

Table 6.16 Purified scale items .....	159
Table 6.17 Factor loadings for measurement items of constructs.....	162
Table 6.18 - Discriminant validity .....	164
Table 6.19 Structural model Goodness of Fit Statistics.....	165
Table 6.20 Parameter estimates, t-values & significance levels .....	166
Table 6.21 Single group goodness of fit for B2B and B2C market contexts.....	169
Table 6.22 Single group's regressions estimates for B2B, B2C market contexts.....	171
Table 6.23 MGIT - comparing $\chi^2$ differences for B2B & B2C markets.....	173
Table 6.24 MGIT – goodness of fit statistics for market contexts.....	174
Table 6.25 Single group's analysis for product and services contexts .....	176
Table 6.26 Single group's regression estimates for product and services .....	177
Table 6.27 MGIT comparing $\chi^2$ differences for product and services contexts .....	178
Table 6.28 MGIT – goodness of fit statistics for product and services contexts .....	179
Table 6.29 Research hypotheses, parameter estimates and t-values.....	182
Table 7.1 Chapter 7 outline.....	184
Table 7.2 Regression path estimates for product & service co-creation.....	194

## List of Appendices

Appendix 1A	Pilot study high co-creation scenario .....	225
Appendix 1B	Pilot study moderate co-creation scenario .....	226
Appendix 1C	Pilot study low co-creation scenario .....	227
Appendix 2	Pilot study participant survey questionnaire .....	228
Appendix 3	Pilot study normal distribution histograms for scale items .....	229
Appendix 4	Pilot study check for normal distribution for scale items .....	232
Appendix 5a	Main study <i>B2C product scenario</i> (high co-creation) .....	233
Appendix 5b	Main study <i>B2C product scenario</i> (moderate co-creation) .....	234
Appendix 5c	Main study <i>B2C product scenario</i> (low co-creation) .....	235
Appendix 5d	Main study <i>B2C service scenario</i> (high co-creation) .....	236
Appendix 5e	Main study <i>B2C service scenario</i> (moderate co-creation) .....	237
Appendix 5f	Main study <i>B2C service scenario</i> (low co-creation) .....	238
Appendix 5g	Main study <i>B2B product scenario</i> (high co-creation) .....	239
Appendix 5h	Main study <i>B2B product scenario</i> (moderate co-creation).....	240
Appendix 5i	Main study <i>B2B product scenario</i> (low co-creation).....	241
Appendix 5j	Main study <i>B2B service scenario</i> (high co-creation).....	242
Appendix 5k	Main study <i>B2B service scenario</i> (moderate co-creation).....	243
Appendix 5l	Main study <i>B2B service scenario</i> (low co-creation).....	244
Appendix 6A	Main study Survey questionnaire for product scenario .....	245
Appendix 6B	Main study Survey questionnaire for service scenario .....	247
Appendix 7	Main study Ethics approval letter .....	249



Appendix 8	Main study Normal distributions histogram plots for scale items ....	251
Appendix 9	Main study Z scores skewness and kurtosis for scale items .....	261
Appendix 10	Main study Z Scores results to assess outliers in dataset.....	263

## ATTESTATION OF AUTHORSHIP

I hereby declare that this submission is my own work and that, to the best of my knowledge and belief, it contains no material previously published or written by another person (except where explicitly defined in the acknowledgments), nor material which to a substantial extent has been submitted for the award of any other degree or diploma of a university or other institution of higher learning.

Author' signature\_\_\_\_\_

Date\_\_\_\_\_

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## ABSTRACT

This is a study of co-creation and its marketing outcomes. The theoretical and conceptual literature on co-creation suggests causal paths between co-creation and its consequences. This study develops a research model to test the causal relationships between co-creation and the marketing outcomes of satisfaction, trust, relationship strength, attitudinal and behavioural loyalty. While the concept of co-creation is not new, Vargo & Lusch (2004) highlight the relevance of co-creation as a customer-centric means of generating value in contemporary market conditions. Most early empirical research on co-creation adopts interpretive methods to explore the value-generation capacity of the concept. More recently, positivist studies on co-creation have emerged, however they investigate the issue in a narrow context and offer only a partial view of the consequences of co-creation.

This study adopts a positivist stance to study the influence of co-creation on a nomological net of marketing outcomes. Additionally, this study investigates the causal paths between co-creation and trust and co-creation and relationship strength, two paths which are theoretically postulated, but not yet tested.

This study adopts a two-stage, quasi-experimental research design. The quasi-experiments are operationalised by means of experimental scenarios and survey questionnaires. The scenarios provide the means to vary the level of co-creation and the questionnaire captures the participants' perceptions of co-creation and, its influence on the dependent marketing outcome variables.

Stage 1 of this study is a pilot, where a student sample is adopted to test co-creation and its marketing outcomes in a single B2C service context. Structural equation modelling analysis of the dataset shows that, as postulated, co-creation has a positive influence on marketing outcomes and this preliminary study has been published (Rajah, Marshall, & Nam, 2008).

The quasi-experiments for the main study comprise a within-subject, multiple business context research design. The aim of the multiple contexts is to investigate whether co-creation is generalisable across different business contexts. The main study institutes both theoretical and methodological refinements into the research model developed in the pilot. Specifically, the work institutes improvements to the new co-creation and relationship strength scales, measures attitudinal and behavioural loyalty as separate constructs, and develops new scenarios for the multiple business contexts. The within-subjects design for the main study means each participant provides data for two scenarios. Thus 290 non-student participants yield 563 good responses.

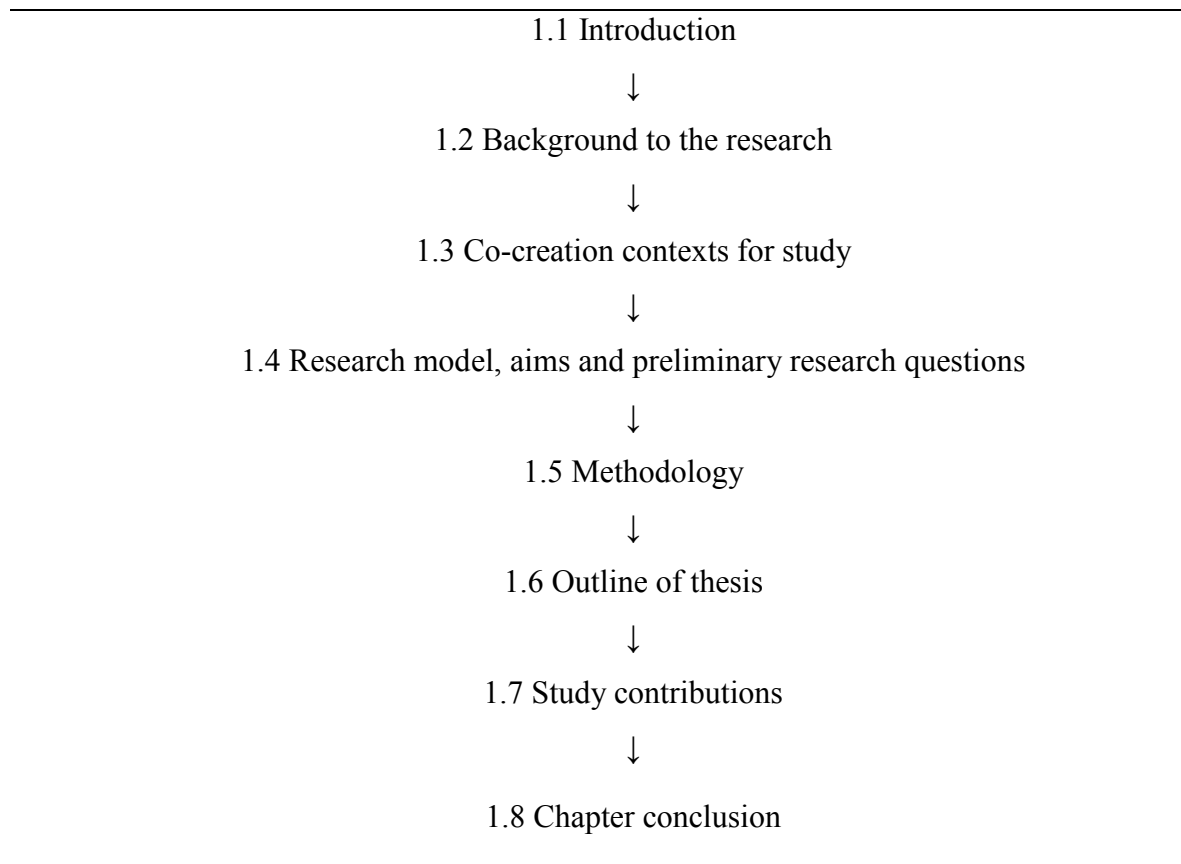
Analysis of the dataset for the main study, through structural equation modelling, shows a good measurement model yielding robust statistics of reliability, convergent and discriminant validity for the constructs. Overall, the structural model provides confirmatory support for the positive influence of co-creation on marketing outcomes. Multi-group invariance testing (MGIT) shows similarities in structural paths for the marketing outcomes for the B2B and B2C market contexts, and only moderate differences in the structural paths for the product and service business contexts. Thus, the results of the research provide confirmatory evidence of co-creation's influence on marketing outcome constructs, hitherto only postulated.

The contributions of the study are first, it provides empirical support for the influence of co-creation on downstream marketing outcome constructs. The results show that co-creation is closely related and is part of the nomological net of marketing outcome constructs in the research model for this study. Second, the thesis contributes by synthesising an operational definition of co-creation. Third, the study contributes by developing new scales for the co-creation and relationship strength constructs. Finally, the multi group invariance testing reveals results show that co-creation is generalisable

across several business contexts. Post-hoc analysis indicate that co-creation could occur in the forms of transactional and relational marketing exchanges.

## CHAPTER 1: INTRODUCTION TO RESEARCH PROBLEM

Table 1.1 Chapter 1 outline



### 1.1 Introduction

The primary aim of this study is to investigate to what extent co-creation contributes to key marketing outcomes of satisfaction, trust, relationship strength, attitudinal and behavioural loyalty. A multiple contexts study is proposed to test the generalisability of the consequences of co-creation in different business contexts. To operationalise the co-creation construct, a definition of co-creation is developed and used to generate a measurement scale for the co-creation construct to investigate its influence on marketing outcomes.

## 1.2 Background to the research

A vital step in the evolution of marketing is exploring approaches for customer-centric marketing strategies (Parasuraman, 1998). One emerging concept consistent with a customer-centric focus is customer co-creation (Sheth, Sisodia, & Sharma, 2000). In simple terms, co-creation in marketing means the active involvement and collaboration of a customer with the supplier with a view to creating customer value. The outcome of co-created marketing is that it generates a unique and focussed customer solution. For the supplier, co-creation provides the company with a differential competence that is difficult for a competitor to replicate, at least in the short term. In short, the supplier is able to build a competitive advantage by adopting co-creation marketing in the business process.

### 1.2.1 Meaning of co-creation

In marketing, one meaning of co-creation broadly refers to joint problem-solving between the buyer and seller and other actors during the design, production, delivery and purchase stages of the supply value chain with the aim of creating a customer solution. The starting point for a co-created solution is the active participation and interaction of the buyer with the supplier company in the creation of a customer solution. In co-creation, the customer is a key actor in contributing to value creation. Therefore in co-creation the buyer plays an equally important role in the value-creation. This is in contrast to supplier-centred marketing where the seller plays the dominant role of value creator and the customer is the recipient of value created by the supplier (Grönroos, 2008; Ramirez, 1999; Wikstrom, 1996a).

Co-creation delivers marketing outcomes for both the buyer and seller. For example, in co-created marketing the buyer has the opportunity to contribute jointly to developing a customer focussed solution and, in the process develop strong relational



bonds with the seller. The seller on the other hand benefits from co-creation marketing by generating customer loyalty and developing a deeper understanding of customer needs through the co-created marketing exchange (Selden & MacMillan, 2006).

In supplier-centric marketing exchange, the focus is primarily on delivering the product offering and not on the customer solution. The focus on the product offering is viewed as a limited way of satisfying buyer needs (Woodall, 2004). A customer solutions approach as adopted in co-creation marketing presents a more in-depth means of addressing and satisfying customer needs (Sawhney, 2006; Tuli, Kohli, & Bharadwaj, 2007). Therefore, it is posited that co-creation marketing offers superior marketing solutions compared to supplier-centric product offerings for the buyer and, the seller benefits by obtaining a deeper understanding of customer needs (Selden & MacMillan, 2006; Tuli et al., 2007) and, a customer-centric marketing mind-set (Parusuraman & Grewal, 2000; Prahalad & Ramaswamy, 2003; Ramirez, 1999; Vargo & Lusch, 2004a).

Since Vargo and Lusch's (2004) seminal article in the *Journal of Marketing* there is increasing emphasis on investigating how co-creation contributes to key marketing outcomes. There is general acceptance that co-creation is a customer-centric marketing approach. However, there are different perspectives regarding the meaning of customer co-creation. Researchers have applied a range of terms to reflect the idea of co-creation in the marketing literature. For example, authors have employed terms such as "customer participation", "joint production", "co-production", "collaboration", and "joint-value creation" to capture the underlying meaning of customer co-creation (Auh, Bell, McLeod, & Shih, 2007; Bendapudi & Leone, 2003; Evans & Wolf, 2005; Grönroos, 2008; Kellog, Youngdahl, & Bowen, 1997). However, these terms do not always mean the same thing. This lack of clarity of the meaning of co-creation provides an opportunity in this study to synthesise the literature to contribute to an improved understanding of the meaning of co-creation. Co-creation for this study is defined as the

active participation of the buyer, seller and other actors in the purchase process to undertake joint problem solving to generate a customer solution or to create new insights or a re-configured customer solution. The detailed development of this definition is reported in chapters 2 and 5.

### 1.2.2 Relevance of co-creation

Increased competitive activity, widespread information availability, increasing levels of customer empowerment and more widespread adoption of information communication technology are examples of changing market conditions driving the adoption of co-creation marketing (Kandampully, 1998).

Co-creation marketing generates both tangible and intangible outcomes (Vargo & Lusch, 2004a). The tangible outcome in a co-created marketing exchange is the customer focussed customer solution arising from the joint problem solving of the buyer and seller (Bonney & Williams, 2009; Sawhney, 2006; Tuli et al., 2007). It is suggested that a customer solutions perspective better provides for a more in-depth understanding of customer needs and provides enhanced tangible outcomes compared to tangible outcomes generated in a non-co-created marketing exchange (Bonney & Williams, 2009; Sawhney, 2006; Tuli et al., 2007). In addition to the tangible outcome, co-creation marketing generates intangible outcomes. The interactions and joint problem solving between the buyer and seller generates intangible outcomes in the context of deep learning for both the buyer and seller (Selden & MacMillan, 2006; Woodside & Wilson, 2003). This deeper learning enables superior customer solutions compared to the focus on product attributes in a non-co-created marketing exchange. The generation of a superior customer solution in a co-created exchange thus contributes to high levels of satisfaction, trust, relational bonds, and strong customer loyalty between the buyer and seller (Malaviya & Spargo, 2002).

Co-creation is not a new concept (Grönroos, 2008), but changing conditions in the marketplace are making co-creation marketing more appropriate in contemporary times. Some of these conditions making co-creation relevant in contemporary society are identified as the ubiquitous availability of information, customer empowerment and the widespread adoption of communication information technology (Denegri-Knott, Zwick, & Schroeder, 2006; Niininen, Buhalis, & March, 2007; Ouschan, Sweeney, & Johnson, 2006). Advances in communication technology are playing a major supporting role in making information widely available for consumers. Information availability and rapid enhancements in communications technology are contributing to creating a more empowered and sophisticated customer (Kandampully, 1998). The empowered customer is one that seeks higher levels of participation, involvement and interactions. Widely available information has, in turn, reduced the dominant role of the seller and empowered the customer in terms of the buyer-seller relationship. Thus, the widespread availability of information and developments in communications technology facilitate and support the relevance of co-creation marketing.

### 1.3. Co-creation contexts for study

Co-creation arises in a number of contexts. This section demonstrates how co-creation is contextualised in this study. Co-creation is briefly defined here as interactive joint problem solving between two or more actors to generate a customer focussed solution. On the basis of this definition, co-creation is framed in three contexts in this study.

The first context of co-creation is that it investigates the outcomes of co-creation from the buyer's viewpoint to assess the extent to which co-creation engenders customer-centric solutions, as claimed by Sheth and colleagues (2000).

Second, co-creation is apparent in different points of the supply chain. For example, co-creation may occur in the design, production, distribution, purchase and post-purchase phases of the supply chain. Companies such as Volvo involve customers in the design phase of product development; some companies such as Dell Computers, Adidas, Nike and Subway adopt mass customisation strategies to incorporate degrees of co-creation in the production phase of the supply chain. IKEA and Amazon.com thread co-creation within the distribution stage of the value chain and some retail businesses choose to adopt co-creation marketing in the purchase and post-purchase phase of the supply chain. The ability to adopt co-creation at different points of the supply chain suggests that co-creation is a widely applicable concept, and that businesses have an opportunity to incorporate co-creation at a point that best aligns with their own business logic to generate competitive advantages for themselves in the marketplace. In the context of the supply chain, this study is framed to evaluate how co-creation generates positive marketing outcomes for the buyer in the purchase stage of a marketing exchange.

Third, the literature points to co-creation arising in a range of business circumstance, for example, in B2C (Tynan, McKechnie, & Chhuon, 2009) and B2B market contexts (Ng, Maull, & Yip, 2009; Ueda, Takenaka, & Fujita, 2008), in services marketing, healthcare (Andersson, Rosenqvist, & Ashrafi, 2007; Hyde & Davies, 2004), tourism (Niininen et al., 2007), education (Kotze & du Plessis, 2003), financial services (Auh et al., 2007) ), in tangible product marketing (Katz & Sugiyama, 2005), computer mediated (Edvardsson, Enquist, & Johnston, 2005; Nambisan & Baron, 2009) and customer community contexts (Rowley, Kupiec-Teahan, & Leeming, 2007). Hence, the third context of co-creation for this study is investigating whether the outcomes of co-creation vary between B2C and B2B markets and, between product and service contexts.

The basis for the choice of B2C and B2B market contexts made here is that buyers in B2C markets are becoming sophisticated, are more empowered and have greater access to information (Denegri-Knott et al., 2006; Niininen et al., 2007; Ouschan et al., 2006). These shifts in buyer circumstances are eroding the balance of power away from the seller. These changes in customer circumstances suggest that buyers in B2C markets desire greater levels of interactions and collaboration with the seller in generating customer solutions as in B2B markets (Kandampully, 1998; Wikstrom, 1996a). Therefore, this study focuses on investigating whether the outcomes of co-creation are similar or different in B2C and B2B markets.

Furthermore, neither the service (Grönroos, 2008) nor service-dominant logic (Vargo & Lusch, 2004a) perspectives distinguish differences between service and tangible product marketing. The service logic and SDL perspectives suggest it is the solution that contributes to value for the buyer, whether it be a tangible product or service offering. Hence, this study examines whether the outcomes of co-creation are similar or different for relatively tangible product co-creation and relatively intangible service co-creation contexts.

#### 1.4 Research model, aims and preliminary research questions

The aim of this study is to investigate to what extent different levels of co-creation influence the important marketing constructs of satisfaction, trust, relationship strength, attitudinal and behavioural loyalty. Figure 1.1 presents the proposed research model and Table 1.2 shows a series of research questions arising from the preliminary research model and discussion set out in section 1.3.

Figure 1.1 Preliminary research model

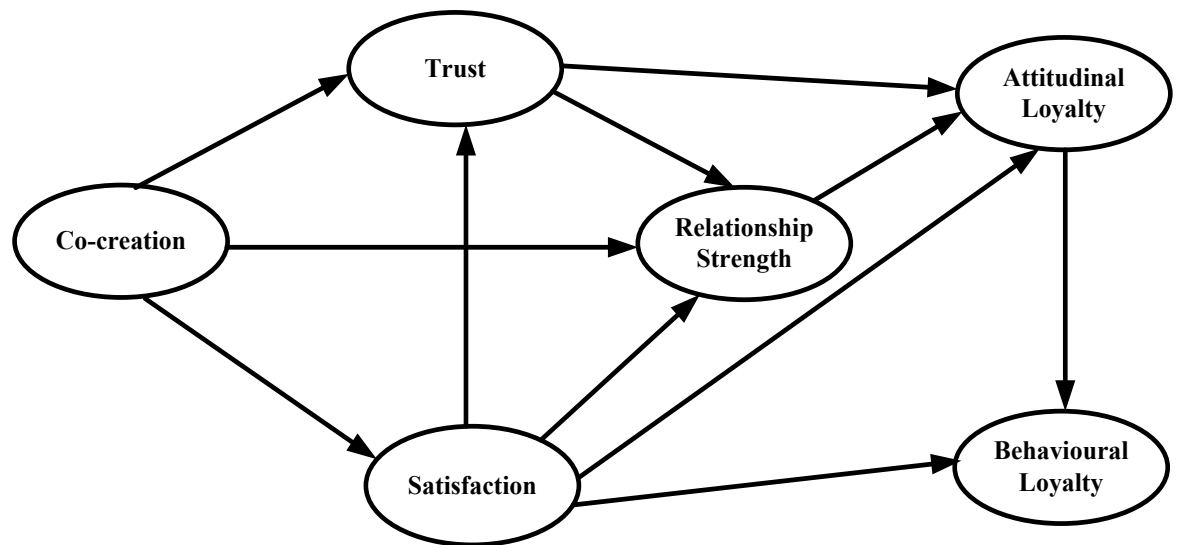


Table 1.2 Research questions

Research questions	Pilot study	Main study
To what extent do higher levels of co-creation affect marketing outcomes of satisfaction, trust, relationship strength, attitudinal loyalty and behavioural loyalty?	X	X
To what extent do higher levels of co-creation affect marketing outcomes in business-to-business (B2B) and business-to-consumer (B2C) market contexts?		X
To what extent do higher levels of co-creation affect marketing outcomes in product marketing and service marketing contexts?		X

## 1.5 Methodology

A positivist research design is adopted. The justification for a positivist research design is three-fold. First, the conceptual literature provides theoretical support for causal relationships between co-creation, satisfaction, trust and customer loyalty (Bendapudi & Leone, 2003; Malaviya & Spargo, 2002; Mascarenhas, Kesavan, & Bernacchi, 2004), relationship strength (Sheth et al., 2000; Vandenbosch & Dawar, 2002; Vargo & Lusch, 2004a).

Second, there are some positivist studies investigating co-creation and marketing outcome, however these studies investigate co-creation and its outcomes in a narrow context. For example, studies have empirically investigated co-creation and its influence on satisfaction and repurchase intentions (Dong, Evans, & Zou, 2008), co-production and its influence on attitudinal and behavioural loyalty (Auh et al., 2007), customer participation and its effect on satisfaction (Bendapudi & Leone, 2003; Kellog et al., 1997). The narrow scope and partial nature of these previous studies provide an opportunity to conduct a study incorporating a broader set of marketing outcome constructs, and to include relationships between constructs which have been theoretically conceptualised, but not yet empirically investigated. The relationships between the co-creation and trust and co-creation and relationship strength constructs are two relationships in the research model which have not been quantitatively tested before. Hence, this study distinguishes itself from previous studies by capturing a broader set of dependent constructs as outcomes of co-creation and including relationships between constructs which have not been tested and reported in the literature.

The third rationale for a positivist research design is an extension of the first, in that the dependent constructs of satisfaction, trust, attitudinal and behavioural loyalty in the research model have been studied before with positivist research designs. For example, studies show that satisfaction contributes to trust and continuity in buyer-seller relationships (Selnes, 1998), satisfaction contributes to customer retention and trust contributes to customer retention (Ranaweera & Prabhu, 2003), and that trust contributes to stronger relationships and customer loyalty (Sirdeshmukh, Singh, & Sabol, 2002). Thus these studies provide a useful source of validated measurement scales for the operationalisation of the dependent constructs in the research model.

Figure 1.1 presents a model showing causal relationships between co-creation and outcome variables. The main construct of interest in this study is the co-creation

construct. It is hypothesised that where co-creation occurs in the purchase context, it has positive effects on the dependent constructs of satisfaction, trust, and relationship strength, attitudinal and behavioural loyalty.

A quasi-experimental research design with a two-staged research design is adopted in this research. The two-staged approach presents an iterative and systematic approach to studying co-creation and its outcomes. The first stage is a pilot study which explores the causal relationship between co-creation and its outcomes with a moderate-sized sample of 177 student participants in a single service co-creation context. The results of the pilot study provide pointers for refining the theoretical research model, measurement scales and experimental scenarios for the main study. The main study adopts uses a larger sample size of 290 customers from a broader cross-section of society and investigates co-creation and its outcomes in multi-contexts.

The pilot study employs a quasi-experimental research design to test the proposed research model in Figure 1.1 shown above. The sample for the pilot study is drawn from students. Confirmatory factor analysis and structural equation modelling analysis are the primary analytical techniques used to test the causal relationships in the research model. The AMOS structural equation modelling software is utilised for analysing the relationships between the constructs in the research model. The empirical data in the pilot study is collected by participants completing a survey questionnaire after reading an experimental scenario. The results from the pilot Study provide the opportunity to refine the theoretical research model in the main study to undertake a larger and confirmatory study of co-creation and its marketing outcomes.

The main study adopts a refined research approach, drawing from the theoretical and methodological base provided by the pilot study. It draws on a larger sample of customers in New Zealand and tests co-creation and its relationships with downstream marketing variables in a multi-contexts study. The multiple-contexts of co-creation in



the main study provide the data to allow for comparisons of business-to-business and business-to-consumer contexts, and product and service co-creation contexts. As in the pilot study, the main study adopts a quasi-experimental research design to collect data for the second phase of the study. The participants for the second phase are 290 employees working in organizations in New Zealand. The main study uses a within-groups research design, hence each participant experiences two experimental conditions within different contexts. Confirmatory factor analysis and structural equation modelling techniques are again the primary analytical techniques used for the main phase of the study.

## 1.6 Outline of thesis

### 1.6.1 Chapter 1 Introduction to research problem

Chapter 1 presents an introduction to the co-creation concept as the focal issue of the research and discusses the gap in marketing knowledge in the area of customer co-creation. This chapter provides an initial definition of co-creation and trends supporting co-creation marketing in contemporary society. The remaining sections of Chapter 1 discuss the scope and contexts of co-creation for this study. A causal research model of co-creation and its influence on key marketing outcomes, research aims and preliminary research questions are outlined. A positivist and quasi-experimental research design is outlined and briefly justified. The chapter ends with the contributions of this study for both marketing theory and managerial practice.

### 1.6.2 Chapter 2 Literature review

Chapter 2 provides an in-depth literature review of customer co-creation framed within the context of the research objectives and research hypotheses for the study. Firstly, this chapter briefly explores the development of the co-creation construct in

marketing. Next, the theoretical concepts that inform on co-creation are explored and the theoretical concepts that best align with this study are explained and justified. Then, a synthesis of the literature is presented to generate an operational definition of customer co-creation for the study. The operational definition provides the basis for developing a measurement scale for the customer co-creation construct. The literature review supports a conceptual research model for the link between customer co-creation and its causal associations with key marketing outcomes of satisfaction, trust, relationship strength, attitudinal and behavioural customer loyalty constructs. The research model is applied in multiple contexts, hence a justification is provided to for the selection of the specific research contexts for this study. All the constructs in the research model are defined for the context of this study and the chapter ends with the refined research questions and research hypotheses for the study.

### 1.6.3 Chapter 3 Overall research design

Chapter 3 presents the overall research design and the rationale for the selection of the positivist methodology used in this study. The methodology adopted for this research is categorised as empirical, objective and positivist. Consonant with a positivist research design, a quasi-experimental design is adopted for the study. The study is conducted over two phases. Study 1 (discussed in chapter 4), is a pilot study and Study 2 (chapters 5 & 6) represents the main phase of the research. Experimental scenarios and questionnaires are used to collect data from participants in the study. Confirmatory factor analysis and structural path analysis are the primary analytical techniques used to analyse the data collected in both phases of the study.

#### 1.6.4 Chapter 4 Pilot study - research design, analysis and discussion

Chapter 4 frames the specific quasi-experimental research design, presents the analysis, results, and discussion of the pilot study. The sample size for the pilot study comprises a student sample with 177 responses and is conducted in a single B2C service context. The results in the pilot study substantially support the research model in Figure 1.1. The results of the pilot study were presented at the Advances in Consumer Research conference in November 2007, and subsequently published in the *Advances in Consumer Research Proceedings in 2008* (Rajah et al., 2008). Specific refinements to the theoretical research model, experimental design and measurement scale were noted from the feedback at the ACR conference and these refinements instituted in the research model and quasi-experimental research design for the main study.

#### 1.6.5 Chapter 5 Main study research design

Chapter 5 highlights the specific refinements to the research model and quasi-experimental research design from feedback from the results of the pilot study. The operational definition of co-creation adopted in this study is developed from a synthesis of the literature. All remaining constructs used are defined for this study. The operational definitions of the constructs in the research model enable development and selection of measurement scales. The main study adopts a refined research model from the directions noted in the pilot study and draws data from 290 non-student customer participants. Co-creation and its outcomes for the main study are investigated in multiple contexts in a within-groups study. This chapter reports on the development of the multi-contexts experimental scenarios, measurement scales and questionnaire instrument for the main study. This chapter concludes with a discussion of specific procedures to ensure reliability and validity in the design of the role-playing scenarios,

survey questionnaire and procedures in collecting the empirical data from the participants.

#### 1.6.6 Chapter 6 Main study findings

The analysis of the data-set for study is undertaken in three stages. Stage 1 involves data screening and exploratory data analysis to assess if the data-set conforms to basic assumptions for multivariate data analysis. Exploratory factor analysis is subsequently carried out to assess the validity of each of the measurement scales used for the study. Scale items with low loadings and high cross-loadings were removed from further analysis, if removal was theoretically justified. The remaining items were assessed for reliability and the dataset screened for multicollinearity.

The next stage of analysis pertains to the development of a measurement model using confirmatory factor analysis (CFA) technique in structural equation modelling. The goodness of fit statistics showed a good fitting measurement model. The results in the CFA were then assessed for convergent and discriminant validity. The results showed strong levels of both convergent and discriminant validity for the constructs in the hypothesised research model.

The derivation of a measurement model with good fit, enabled the testing of the structural model and the goodness of fit statistics, along with structural path estimated presented evidence of good fit. Multi-group invariance testing was undertaken on the structural model to compare the outcomes of co-creation for the multiples co-creation contexts. The multi-groups analysis in structural equation modelling presented little difference for the outcomes of co-creation for the B2B and B2C co-creation contexts and, presented only moderate differences for the outcomes in the services and tangible product co-creation contexts. The last section of chapter 6 links the results to the specific

research questions in the study and concludes by presenting which of the hypotheses postulated are accepted or rejected.

#### 1.6.7 Chapter 7 Discussion of findings, study contributions & future research

The empirical results in the overall structural model support the contention that co-creation contributes to key marketing outcomes in the research model. All the structural paths were significant and thus accepted. The multi-group analysis showed little difference between the outcomes of co-creation for B2B and B2C market contexts providing empirical support for the conceptual literature, which suggests that B2C markets are similar to B2B markets in some respects. The multi-group analysis for services and tangible product market does show moderate degree of differences for the outcomes of co-creation in the structural model. These differences are explained and justified, and add to the confidence in the structural model. Post-hoc analysis of the results show co-creation may arise in both transactional and relational forms. The remaining sections of this chapter assess both theoretical and practical contributions of this study. The part of this chapter focuses on future research opportunities arising from this study.

### 1.7 Study contributions

#### 1.7.1 Marketing theory

Co-creation is an emerging area of research and leading academics advocate co-creation strategies creates long term sustainable competitive advantages for a business (Berry, 2002; Grönroos, 2008; Prahalad & Ramaswamy, 2003, 2004; Vargo & Lusch, 2004a). The Marketing Science Institute's 2010-2012 research priorities indicate that co-creation is an area of research priority. This study tests co-creation on a wide range of marketing outcome constructs, including the relationships between co-creation and

trust and, co-creation and relationship strength constructs, two relationships which have hitherto now been theoretically conceptualised but, as yet empirically untested. Thus, by including a broader set of constructs into the research model, this study develops a more complex research model. The greater complexity in the research model in this study contributes to a better understanding of the nomological net of co-creation and marketing outcomes (Ulaga & Eggert, 2006).

Additionally, there are very few studies that investigate co-creation in multiple contexts with empirical data. This study fills the gap in the literature by investigating co-creation and its outcomes in multiple business contexts and therefore lends itself to generalising the co-creation construct. The literature on co-creation shows that the definition of co-creation requires clarification for operationalising the co-creation construct for academic research, as there are many nuances in the interpretation of its meaning (Frow, Payne, & Storbacka, 2011). Thus a further contribution of this study is an operational definition of co-creation. This operational definition enables the development of a measurement scale for the co-creation construct for the study. As there is no reported measurement scale for co-creation in the literature, the development of co-creation measurement scale is an additional contribution to marketing theory.

#### 1.7.2 Managerial practice

From a practitioner's viewpoint, this study provides an understanding of how co-creation generates value through its outcomes and offers guidelines to employees on how to thread co-creation into the business model. Thus the results of the research offer managerial guidance on how to operationalise co-creation into their business process. Specifically, the results in this study offer guidance on whether co-creation differs for B2B and B2C market contexts and tangible product and services co-creation marketing.

## 1.8 Chapter conclusion

The study of co-creation is emerging and growing as it seeks to discover and understand how it can create competitive advantage for a business. This study proposes customer co-creation in the purchase process can influence key marketing performance indicators. The literature shows a gap in research on the link between customer co-creation and its impact on key marketing outcomes particularly with regard to positivist empirical research. The next chapter frames co-creation theoretically through a literature review, develops an operational definition of co-creation and sets forth a causal research model linking co-creation and its marketing outcomes.

## CHAPTER 2: LITERATURE REVIEW

Table 2.1 Chapter 2 outline

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2.1 Introduction
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2.2 Research questions
↓
2.3 Underlying theoretical logic for co-creation
↓
2.4 Modelling co-creation and its outcomes
↓
2.5 Chapter conclusion

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### 2.1 Introduction

This chapter introduces the research aims for the study. Following the research aims, this chapter focuses on the discussion of the theoretical concepts underlying co-creation, sets out an operational definition for co-creation, develops a research model for the study and justifies the relationships between co-creation and other dependent constructs in the research model.

The co-creation concept itself is not new in the marketing literature; however, there is a renewed research focus to discover how co-creation delivers value (Hoyer, Chandy, Dorotic, Krafft, & Singh, 2010; Vargo & Lusch, 2004a). Vargo & Lusch (2004) ignited the debate about the customer's role as a vital actor in contributing to the value creation process. This is in contrast to the conventional value chain framework where the customer is regarded a passive actor in the value creation process (Ramirez, 1999; Vargo & Lusch, 2004a; Wikstrom, 1996a, 1996b).

In other words, in the conventional supplier-centric perspective, the seller plays the dominant actor in the creation, management, and delivery of the product offering to the



customer, while the buyer adopts a passive role in the value creation process (Calhoun, 2001; Prahalad & Ramaswamy, 2003; Seybold, 2001). However, in the co-creation perspective, the buyer is in the nexus of active value creation (Boyle, 2007; Senge & Carstedt, 2001).

In co-creation, value creation is a collaborative effort of all ‘actors’ in the upstream and downstream stages of the supply-chain. By definition, ‘all actors’ is inclusive of any actor who adds value to the problem-solving process. Thus, co-creation includes buyers as a key contributor to value creation.

## 2.2 Research questions

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### Research question 1

To what extent do higher levels of co-creation affect marketing outcomes of satisfaction, trust, relationship strength, attitudinal loyalty and behavioural loyalty?

### Research question 2

To what extent do higher levels of co-creation affect marketing outcomes in business-to-business (B2B) and business-to-consumer (B2C) market contexts?

### Research question 3

To what extent do higher levels of co-creation affect marketing outcomes in product marketing and service marketing contexts?

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Research question 1 is addressed in the pilot study with a single context B2C service context quasi-experimental research design, while the main study addresses research questions 1, 2 & 3 with a within-subjects research design in multiple business contexts. The research questions are addressed by a series of hypotheses developed in section 2.4 of this chapter.

### 2.3 Underlying theoretical logic for co-creation

There are a range of theoretical concepts that explain the idea of co-creation. These concepts are identified as the ‘inside track’ (Penrose, 1959; Zander & Zander, 2005), resource-based perspective (Jeppesen & Molin, 2003; Zander & Zander, 2005), service dominant logic (Vargo & Lusch, 2004a, 2008), service logic (Grönroos, 2008), customer value (Payne, Storbacka, & Frow, 2008; Woodside & Wilson, 2003; Zerbini, Golfetto, & Gibbert, 2007), value in-use (Ramirez, 1999; Vargo & Lusch, 2004a), self-serving bias theory (Bendapudi & Leone, 2003), customer socialisation theory, role theory, social exchange theory, script theory (Kotze & du Plessis, 2003), theatre paradigm (Williams & Anderson, 2005), and linking value (Cova, 1997). While there are a range of theoretical concepts that show a link to co-creation, the discussion in this section is narrowed down to a discussion of the theoretical concepts that directly contribute to this study. These theories and concepts are presented in Table 2.2 below.

The focussed theoretical discussion enables first, clarity in developing an operational definition of co-creation for the study and, second, framing of a conceptual model of co-creation and its dependent outcomes. A clear operational definition of co-creation in turn provides the platform for the development of the co-creation measurement scale as well as giving direction for varying the levels of co-creation in the experimental scenarios reported in chapter 4 (pilot study) and chapter 5 (main study) respectively.

Table 2.2 Theoretical and conceptual logic for co-creation

Sources	Literature stream	Theory or concept	Link to co-creation
(Penrose, 1959; Zander & Zander, 2005)	Theory of the growth of firm	‘inside track’ (Penrose, 1959, page 117)	<p>The efforts of sales staff of a supplier company may lead to joint problem solving for the buyer and seller. The joint problem solving creates a competitive advantage for the seller in retaining customer loyalty, preventing switching behaviour and building strong buyer-seller relationships.</p> <p>Joint problem solving generates co-created value for both buyer and seller through specific customer solutions and deeper understanding of customer needs.</p>
(Gibbert, Leibold, & Probst, 2002; Grönroos, 2008; Jeppesen & Molin, 2003; Vargo & Lusch, 2004a; Zander & Zander, 2005)	Resource based view  Service-dominant logic  Service logic	Widening the net for access to resources for firm for value creation  Knowledge management	<p>Interactions and joint problem solving between buyer and seller generates customer-centric solutions. Buyer and seller resources are important for the generation of customer-centric solutions in co-creation</p> <p>Customer co-creation draws on the idea that resources means not only the resource in the possession of the seller but also the resource that is residing with the buyer. By interacting and collaborating with the buyer, the seller can access customer resources to facilitate in the co-creation of value</p> <p>In customer co-creation, the knowledge inherent within the customer is a key resource (asset) for value creation. Customer co-creation enables the knowledge within customers to create value solutions for the customers</p>

(Arora & Singer, 2006; Bailey, Gremler, & McCullough, 2001; Bonney & Williams, 2009; Claycomb & Martin, 2001; Lundkvist & Yarle, 2004; Payne & Holt, 2001; Payne et al., 2008; Sawhney, 2006; Selden & MacMillan, 2006; Senge & Carstedt, 2001; Suprenant & Churchill Jr, 1984; Tuli et al., 2007; Vandenbosch & Dawar, 2002; Vargo & Lusch, 2004a; Woodruff, 1997; Woodside & Wilson, 2003)	Value literature	Forms of value outcomes from co-creation	<p>Enhanced tangible outcomes from co-creation between buyer and seller. The interactions and joint problem-solving generates deeper understanding and learning about customer needs and generates specific and better customer solutions</p> <p>Co-creation generates intangible outcomes Interactions generates deeper learning for both buyer and seller and induces continuous customer learning</p> <p>Co-creation generates intangible outcomes in the context of positive emotional satisfaction, trust, strong buyer seller relationships, customer loyalty and positive word of mouth effect (WOM)</p>
(Bendapudi & Leone, 2003)	Self-serving bias theory	Customer participation and contributions enhances level of satisfaction	<p>Customers who participate in co-producing a service give themselves more credit than other partner when the outcome is successful</p> <p>Conversely customers who co-participate in a service shoulder some level of blame when things go wrong in a service. This has the impact of reducing the level of dissatisfaction</p> <p>Buyers in co-created marketing exchanges experience enhanced degree of satisfaction compared to non-created marketing exchange</p>

Table 2.2 shows the ‘inside track’ concept introduced by Penrose in the Theory of the Growth of the Firm (Penrose, 1959), the resource-based view (Zander & Zander, 2005) and service-dominant logic perspectives (Grönroos, 2008; Vargo & Lusch, 2004b). All present the idea that buyer and seller collaborations pave the way for generating a deeper understanding of the customer problem and developing customer-centric solutions. Hence an important attribute of co-creation lies in the joint problem solving and active participation of the buyer and seller in the marketing exchange.

The second idea is that both the RBV and SDL perspective highlight the resources for the customer solution resides in both the buyer and seller. The buyer may be conscious or unaware of the resources he/she possesses. The interactions and collaboration between the buyer and seller through co-creation unlocks and, draws out the resources the buyer possesses to assist in the generation of the co-created customer solution. Therefore joint value creation arising from the pooling of resources of the buyer and seller triggers co-created solutions.

One example of joint problem-solving and joint value-creation is the Dell computer company. Dell markets computer product offerings through product unbundling and modularisation approaches to creating value. These approaches are enabling Dell to collaborate with buyers to generate co-created customer solutions (Magretta, 1998). Similarly sellers adopting open source innovation approaches may tap into the knowledge of “lead users” (Jeppesen & Molin, 2003; Leadbeater, 2006) and deviant users (Flint, 2005) to generate new customer solutions. Therefore the ‘inside track’ concept, resource based view and service-logic viewpoints provide clarity to the underlying meaning of co-creation for this study.

Bendapudi & Leone (1999) suggest that self-serving bias theory explains that when customers participate and contribute towards the customer solution, the buyer experiences higher levels of satisfaction in comparison to marketing exchanges where

the buyer does not participate in the marketing exchange. Hence, this logic suggest that higher satisfaction is an outcome of customer participation in marketing exchanges.

It is also generally accepted that co-created customer solutions generate enhanced outcomes compared to non-created customer solutions (Lundkvist & Yacklef, 2004; Mascarenhas et al., 2004; Wikstrom, 1996a). Specifically the literature states that co-creation, generates further value (Wikstrom, 1996a), personalised value (Lawer, 2005), mutually creates and recreates and reconfigures value (Lundkvist & Yacklef, 2004). Hence these illustrations provide provides conceptual support that co-created solutions provide enhanced outcomes for the buyer. It is further suggested that co-creation engenders a customer solution rather a product offering (Bonney & Williams, 2009; Sawhney, 2006; Tuli et al., 2007). The perspective of a customer solution traps value beyond tangible outcome in an offering. There is support (Berghman, Matthyssens, & Vandenbempt, 2006; Payne et al., 2008; Zerbini et al., 2007) to show that value is composed of tangible and intangible component parts. Thus the perspective of a co-created customer solution captures not only the tangible component, but also captures the intangible value generated in co-creation exchange between the buyer and seller.

Penrose (1959) and Zander & Zander (2005) present an illustration of enhanced tangible value in the context of B2B co-creation in a selling context, where the interactions and dialogue between buyer and seller results in a tailored solution for the buyer. The customised solution arising from the immediate sales situation may also act a catalyst for future collaborative co-creation exchanges between buyer and seller.

Co-creation also generates intangible outcomes for both the buyer and seller (Berghman et al., 2006; Payne et al., 2008; Zerbini et al., 2007). The co-creation process generates deep learning of customer needs beyond the focus on product attributes (Selden & MacMillan, 2006). The interactions and joint problem-solving between buyer and seller generates deeper insights and learning for both buyer and seller (Woodside &

Wilson, 2003). Additionally, co-creation generates strong levels of trust between buyer and seller (Malaviya & Spargo, 2002; Mascarenhas et al., 2004). Selnes (1996) states that the levels of trust generated between buyer and seller is itself a value outcome. These interactions between buyer and seller may also contribute to strong buyer-seller bonds generating buyer and seller loyalty and reduces switching behaviour (Zander & Zander, 2005; Zerbini et al., 2007). More recently Payne (2008) suggests that co-creation engenders emotional value. These illustrations shows instances of intangible outcomes for the buyer when the buyer is co-creating with the seller.

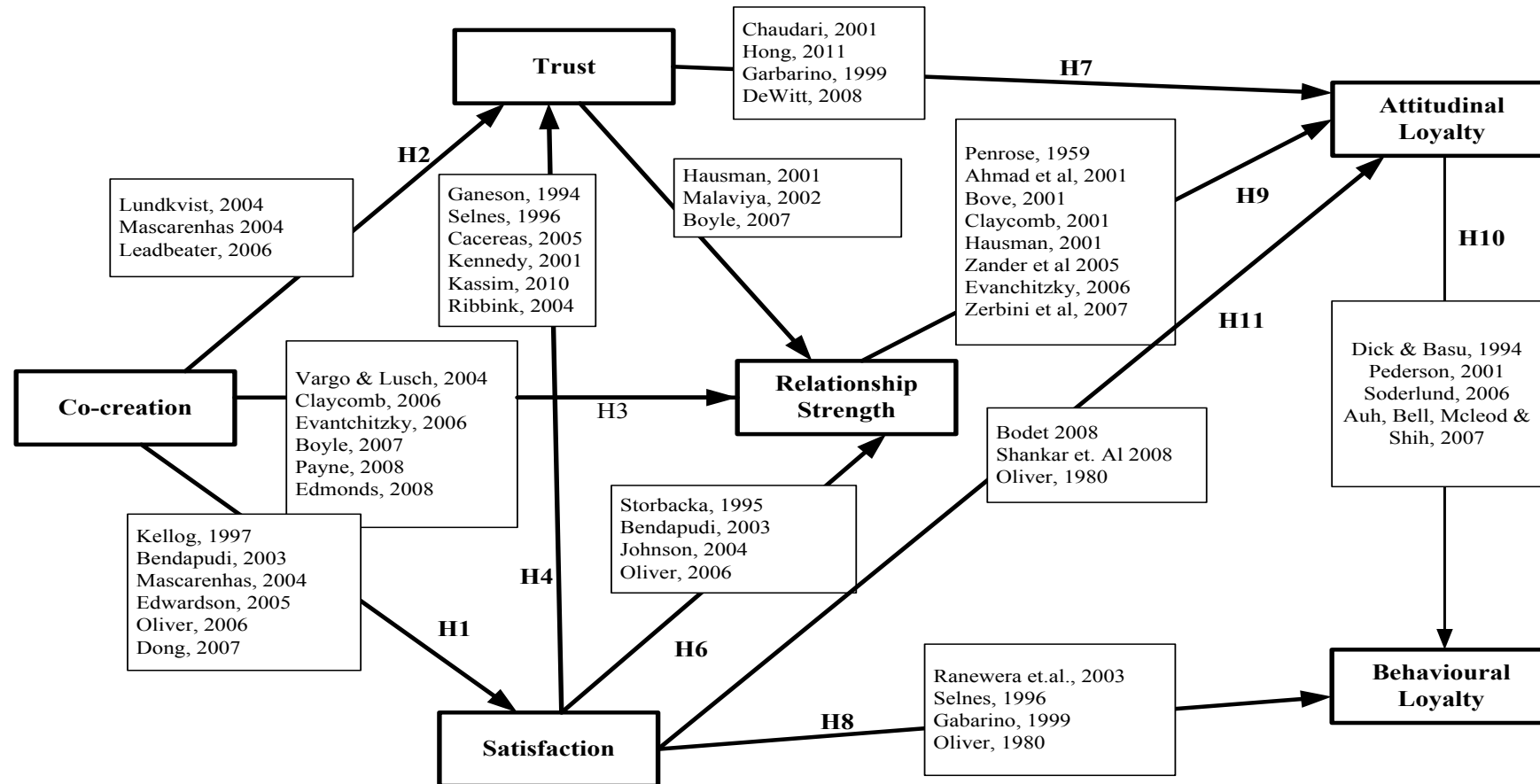
While this study does not measure value explicitly in the research model, the buyer's assessment of marketing outcomes arising from co-creation is an indirect influence on customer perceptions of value in the research model. Hence, the discussion of outcomes is a proxy for the buyer's evaluation of marketing value arising from co-creation in this study.

The theoretical concepts underpinning co-creation assist in identifying and understanding the domain of co-creation which enables better framing of a specific operational definition of co-creation for this study. Second, the discussion provides direction for threading the link between co-creation and its outcomes. Both the above issues are discussed in the next section

## 2.4 Modelling co-creation and its outcomes

In Figure 2.1, below, the preliminary research model is presented again, but this time with references showing the support available in the literature for the various causal relationships postulated. Prior to the discussion of the discussion of the causal paths in Figure 2.1, the literature on co-creation is first reviewed to obtain a clear understanding of the theoretical domain of co-creation to extract an operational definition of co-creation.

Figure 2.1 Theoretical model of co-creation and its outcomes





#### 2.4.1 Synthesising a definition of co-creation

Despite increasing attention on co-creation, there are differing views on the meaning of co-creation. There is general agreement that co-creation generates customer-centric solutions (Sawhney, 2006; Selden & MacMillan, 2006; Sheth et al., 2000; Tuli et al., 2007), however there is no precise meaning of co-creation. Authors have employed terms such customer participation, joint production, co-production, collaboration and joint-value creation which are apparently synonyms for the idea of co-creation (Auh et al., 2007; Bendapudi & Leone, 2003; Evans & Wolf, 2005; Kellog et al., 1997). The range of terms means there is a lack of clarity with regards the meaning of co-creation, so the development of an operational definition of co-creation would assist a better understanding of the domain of co-creation which, in turn, will assist in developing a measurement scale for the co-creation construct. The discussion of the development of measurement scale for the co-creation construct is found in chapter 5, while this section develops the definition of its domain in theoretical terms.

To provide a better delineation on the meaning of co-creation and the domain of co-creation, a literature review of co-creation descriptions is undertaken to derive an operational definition of co-creation as shown in Table 2.3. The analysis of the conceptual co-creation descriptions in Table 2.3 draws out a number of strands reflecting the domain of co-creation. First, co-creation requires active participation and contribution of all actors in the co-creation context. For example in a buyer and seller context, co-creation requires the active participation of both the buyer and seller (Kotze & du Plessis, 2003; Mascarenhas et al., 2004; Vargo & Lusch, 2004a). Second, the active participation of the customer in the marketing exchange generates enhanced outcomes viewed in terms of a solution (Mascarenhas et al., 2004; Ottensen, Ranes, & Gronhaug, 2005; Wikstrom, 1996b). Third, the outcomes of the co-created solution comprises of both tangible and intangible outcomes (Gronroos, 1994; Mascarenhas et

al., 2004). Fourth, the value from the co-created solution outcome is perceived from the ‘eyes of the beholder’ which in the current context of this study is the buyer (Cova, 1997; Gronroos, 1994; Kotze & du Plessis, 2003; Prahalad & Bettis, 2000; Ritson & Elliott, 1995). A final strand reflecting the idea of co-creation is that the customer solution is shaped by both the buyer and seller (Gronroos, 1994; Kotze & du Plessis, 2003; Lundkvist & Yaklef, 2004; Mascarenhas et al., 2004; Prahalad & Bettis, 2000; Ritson & Elliott, 1995). This means that the seller and buyer on his/her own is not able to arrive at the final co-created solution, rather the active collaboration between the buyer and seller evolves in a re-shaped and reconfigured customer solution (Grönroos, 2008; Lundkvist & Yaklef, 2004).

Table 2.3 Co-creation definition descriptions

Sources	Extract of statements defining the meaning and dimensions of the co-creation construct.	Keyword, phrases to reflecting meaning of co-creation
(Wikstrom, 1996a)	“Co-production is buyer seller social interaction and adaptability with a view to attaining further value.”	Buyer seller social interaction Attaining value
(Rice, 2005)	“An open ongoing collaboration between employees and customers to define and create products, services, experiences, ideas and information.”	Open on-going collaboration between 2 or more parties to define and create products
(Lawer, 2005)	Co-creation is the process for distributed value creation between firms and customers or between customers directly to create personalised value	process interactions between actors to create personalised value
(Kotze & du Plessis, 2003)	Co-production is the active participation of the customer in the delivery of the service encounter and at the same time contributing to their own satisfaction, quality and value perceptions	Active participation of customer Contributing to own satisfaction and value perceptions
(Vargo & Lusch, 2004a)	Co-creation is active customer engagement and involvement in the creation of value	Active customer engagement and involvement In value-creation
(Gronroos,	“Value for customers is created throughout	Set within a relationship

1994)	the relationship by the customer, partly in interactions between customers and the supplier or service provider. The focus is not on products but on customer value creating processes where value emerges for customers and is perceived by them	Interactions between buyer and seller generates value  Value as perceived by customers
(Ottensen et al., 2005)	Value co-production is value co-produced by 2 or more actors, with and for each other, with and yet other actors.” Value is not simply added, it is mutually created and re-created among actors with different values	Value created by actors  Value mutually created and recreated among actors
(Vargo & Lusch, 2004a)	Customer is always involved in the creation of production of value.....marketing is a continuous process where production and consumption is part of the same value creating process	Customer part of value creating process
(Bitner, 1995; Ramirez, 1999)	Production is creation, consumption is not destruction of value but creation of value  Customer participation can be viewed as the extent to which customers participate in the provision of a service and the roles customers adopt in a service encounter	Consumption is part of value creation  Roles customer adopt in service encounter
(Prahalad & Bettis, 2000)	Enabling consumers to shape and create a personalised consumption experience.... Personalisation is about the customer becoming a co-creator of the content of their experience. Personalised meaning of the product as a result of the consumption of the product / service and interactions within the experience network.	Customers involved in the creation and shaping of value via interactions within experience network
(Cova, 1997)	“It is not the producer who decrees that their product has a linking value, it is people who going to use it who will give this meaning. Moreover the meanings of objects are no longer fixed and connected with their functions, but free floating each individual may ascribe different meanings to their objects”	Linking value
(Cova, 1997)	Elliot 93 pp 138 makes the hypothesis that in a more and more atomised individualistic society, the lack of community has to be compensated by the	Self identity creation Self expression

consumption of signs and symbols which reassure the individuals of their identity and give meaning to their life, while giving them the illusion of belonging to a virtual community of customers (Belk + Bryce, 93, p293) Thus the marketing system plays a primordial role in the construction of the identity of the post-modern individual

(Ritson & Elliott, 1995)	Individuals who actively involved in the marketing communications process can derive their own personalised meanings of the communications experience. The consequence of individuals interpreting an experience in a “polysemy” of interpretations is that every individual is capable of co-creating their own subjective consumption experience	Derive personalised meanings from communications
(Lundkvist & Yacklef, 2004)	<p>“Conversation is a process during which new ideas and knowledge is jointly created by the parties involved in the exchange; conversation is the source of active participation and mutual commitment between the interactants and finally, attempts to (seriously) involve customers through conversations will transform customers into organisational change agents”.</p> <p>“with regard to customer involvement in firms’ value creation, researchers have identified five roles that these can play: customers as “resources”, “co-producers”, “buyers”, “users” and “products”</p> <p>“.. the use of language in general, conversation and dialogue in particular as a medium of knowledge co-creation and transfer has been emphasised by a number of theorists”.</p> <p>“.....it is not the speaker who acts and the listener who responds; the act of communication is in of itself a joint production, collaboratively arrived at”</p> <p>“neither the firm nor the customers separately would have figured out the idea of developing the “...” solution</p>	<p>Interactions via conversations sharing ideas, transferring meanings results in new forms of reconfigured ideas and meanings</p> <p>Interactions via conversations lead to collective action</p> <p>Problem solving solution may not have been figured out by a single actor. Both actors are required for the new solution generated</p>
(Mascarenhas et al., 2004)	“concept of customer value chain involvement ( CVCI) implies that the target customers should be exposed to its	Active involvement of all actors

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<p>persons, processes, products and brands and to the networking relationships. This exposition is not passive like the spectator audience of a trade show but rather it is an active interaction and participation with all the players and elements of the value chain as long as this involvement adds value to its customers and to its producers. The added value to the customer is the more than a new product that is useful, convenient and state of the art, it is the competitive experience of co-creating the product with the company (in Prahalad and Ramaswamy 2003), the experience of co-producing and co-owning it (in Lengnick-Hall, 1996), the experience of purchasing and repurchasing it and by supporting the firm with positive referrals of its products and services (Schneider and Bowden, 1999). The added value to the producers are the insights from customer interaction and participation, continuous feedback, co-creation and co-ownership of products, customer satisfaction, retention, customer delight, the loyalty that comes from such interactions and the positive referrals that result from delighted customers.”</p>	<p>Active interactions and participations with actors in value chain to co-create product with company</p>
	<p>Added value is greater than product offering, it is the act of co-creating.....and the insights from customer interactions and participation.....</p>
<p>“The current problem with CRM is that it assumes that a company knows how to create value for customers. This old world top down approach does not work anymore. Customers do not always identify with the experience fabricated by companies. They want to shape those experiences themselves, both individually and with other customers from brand communities (in Prahalad and Ramaswamy, 2000). They want experiences that build upon their wired, networked, informed and active lives (in Prahalad and Ramaswamy, 2003).”</p>	<p>Problem with CRM is that it assumes that a company knows how to create value for customers</p>
	<p>Customers now want to be involved in shaping value</p>
<p>“You have to engage customers as co-equal problem solvers, so that they can create value that is unique to them. A CVC driven CRM does not view customers as targets to be had, but as single persons to be treated with personalised, unique and need satisfying experiences (Prahalad and Ramaswamy,</p>	<p>Engage customer as co-equal problem solvers to create unique customer value</p>

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2003).”	
<p>“The companies that cooperate with customers to deliver CVCi based unique experience products and services will enjoy sustainable competitive advantage. It is in the context of delivering producer-customer co-created satisfaction experiences that we propose the CVCi model. The greater the customer involvement, the greater the potential for co-creating lasting satisfying experiences for the customer.”</p>	<p>Cooperate with customers to unique value to create sustainable advantage</p> <p>The greater the customer involvement the higher the potential for lasting satisfying experiences for the customer</p>
<p>“.....Instead we involve most customers to help them determine their own space, their value, their experience and them co-create a product or service that will foster and forge that unique experience for that customer..”</p>	<p>Involve customers to create unique value</p>

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Analysis of the co-creation descriptions in Table 2.3 and drawing from the co-creation strands discussed earlier, two contextual meanings of co-creation become apparent. One meaning appears in the context where the buyer and seller and other actors in the supply chain interact, participate jointly to problem-solve, and generate a customer solution (Bonney & Williams, 2009; Grönroos, 2008; Kristensson, Matthing, & Johansson, 2008; Mascarenhas et al., 2004; Ottensen et al., 2005; Payne et al., 2008; Prahalad & Ramaswamy, 2003). The value of the co-created solution is drawn from the perceptions of the buyer.

The second context is where co-creation arises during consumption when customers interact with product offerings, images, symbols to create new meanings and insights into the consumption process. The linking value concept of Cova (1997) suggests that when customers consume brands and advertising communications they generate new meanings for them and hence are co-creating in the consumption process (Boyle, 2007; Cova, 1997; Flint, 2005; Katz & Sugiyama, 2005; Ritson & Elliott, 1995).

This study adopts the meaning of co-creation in the first context, where the actors interact and collaborate in joint problem-solving to generate customer solutions. A synthesised description of co-creation shows it comprises of the active joint participation, interactions, dialogue and collaboration of the buyer, seller and other actors in the marketing exchange network to enable a more in-depth understanding of the buyer's problem-solving situation. The joint-problem solving between the buyer, seller and other actors generates deep learning and insights to identify customer's latent needs. In some cases, the insights generate a 'eureka' moment for the buyer or seller or both parties, when they develop a clear understanding of the customer problem-solving context, and the deeper insights enable the generation of a customer solution or reconfigured customer solutions (Bonney & Williams, 2009; Kristensson et al., 2008; Lundkvist & Yaklef, 2004; Mascarenhas et al., 2004; Michel, Brown, & Gallan, 2008).

The operational definition of co-creation adopted here for this study, drawn from the above description of co-creation is as follows: "Co-creation is the active participation, interaction, dialogue and collaboration of the buyer and seller and other actors in the marketing exchange to develop a deeper understanding of the customer problem-solving context. The joint problem-solving generates a customer solution or a re-configured customer solution. Buyer perceptions capture the value from the co-created solution."

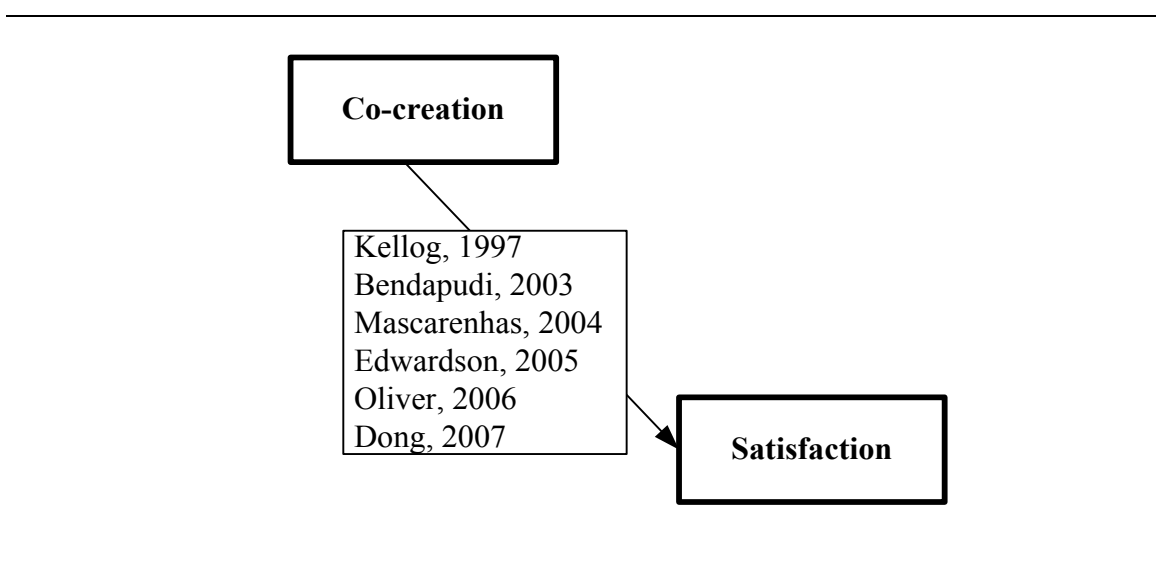
#### 2.4.2 A research model of co-creation and its outcomes

Marketers need to have a better understanding of how different levels of co-creation may influence key marketing outcomes of customer satisfaction, trust, relationship strength and attitudinal and behavioural loyalty in an empirical context. The ensuing discussion presents the theoretical grounding for each of the causal paths in the research model. An operational definition for each of the dependent constructs in the

research model is provided prior to the discussion of each of the paths in the research model. The operational definition of constructs sets out the domain for each construct, and enables the development and selection of measurement scale items for the constructs in the research model. The specific measurement scales adopted for each of the constructs in the research model are discussed in Chapter 5.

#### 2.4.3 Co-creation & satisfaction

Figure 2.2 Co-creation and satisfaction



Customer satisfaction in this study is conceptualised as an overall post-purchase evaluation of the final customer solution (Giese & Cote, 2000; Oliver, 1993; Ranaweera & Prabhu, 2003). The research model postulates that one outcome of a successful co-created customer solution is increased levels of satisfaction. Figure 2.2 shows support for the association between the co-creation and the satisfaction constructs. Research evidence points to a positive relationship between customer involvement in the marketing exchange process and customer satisfaction (Kellog et al., 1997; von Hippel, 2001). Additionally, self-serving bias theory shows the association between customer involvement and satisfaction produces an asymmetric effect in a discrete marketing



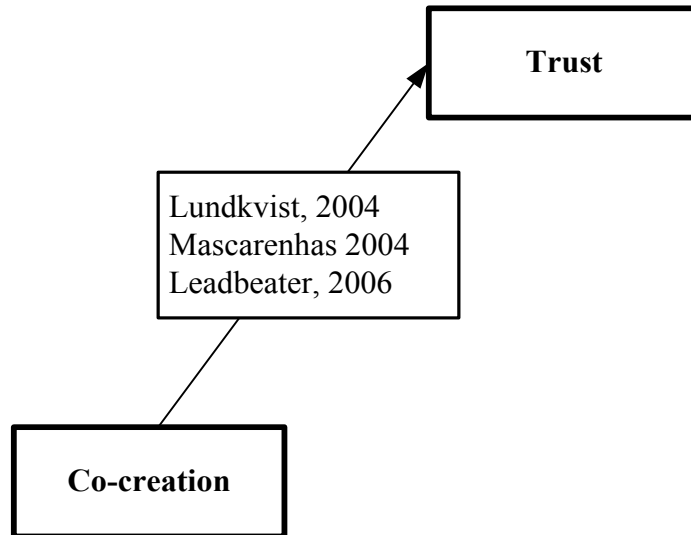
exchange context. Self-serving bias theory suggests that a customer who is involved in co-production often gives him or herself a greater proportion of the credit when the outcome of the co-production effort is successful (Bendapudi & Leone, 2003). This suggests that customer satisfaction is proportionately higher for a customer co-created marketing solution. A recent study of co-creation in a service recovery context shows a co-created customer recovery solution generates higher levels of customer satisfaction and customer intention to re-purchase (Dong et al., 2008). Although not quite in the same context, this study offers encouragement by pointing to the link between the positive associations between co-creation and satisfaction.

A further suggestion is that customer co-creation does not just result in positive customer satisfaction, but it generates customer delight (Mascarenhas et al., 2004). Customer delight occurs when customers receive unexpected or unanticipated outcomes that lead to very much higher levels of satisfaction. Oliver et al (1997) refer to customer delight as the higher reaches of the customer satisfaction spectrum. Satisfaction is principally an attitude translated by customers into a global summary evaluation (Bailey et al., 2001; Oliver, Rust, & Varki, 1997). The global summary evaluation reflects both cognitive and affective dimensions in the assessment of satisfaction evaluation process (Oliver et al., 1997). Therefore a co-created marketing exchange has the potential to capture and tap into the cognitive and affective traits of satisfaction. The first hypothesis in the research model is framed as follows:

*H1 Higher levels of co-creation influences buyer's satisfaction positively.*

#### 2.4.4 Co-creation & trust

Figure 2.3 Co-creation and trust



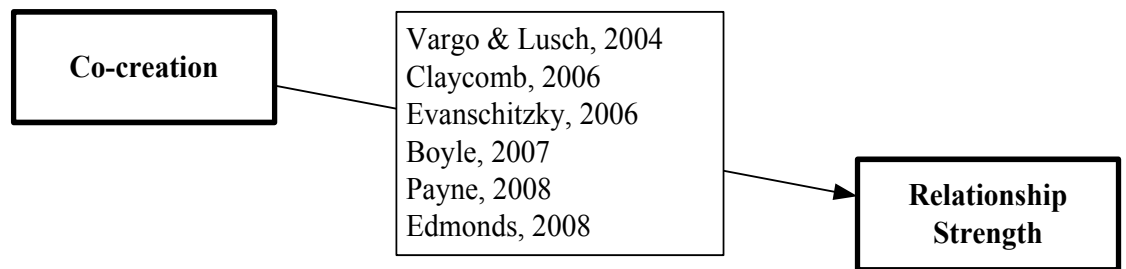
Trust exists when one party has confidence in a partner's reliability and integrity in another (Morgan & Hunt, 1994). Figure 2.3 shows customer co-creation generates trust between the buyer and seller in the marketing exchange. Trust is postulated in Figure 2.3 as an outcome of the customer co-creation process. Trust is "the belief that a party's word or promise is reliable and a party will fulfil his or her obligations in an exchange relationship" (Dwyer & Tanner, 2006). Conceptually, it is suggested that a higher degree of customer co-creation generates higher levels of trust between the customer and the marketer (Evans & Wolf, 2005; Leadbeater, 2006; Lundkvist & Yackle, 2004; Malaviya & Spargo, 2002; Mascarenhas et al., 2004). There are currently no empirical studies that have tested the relationship between co-creation and trust, so this research contributes by filling in this knowledge gap. Following this discussion the second hypothesis for the study is set out as follows:

*H2 Higher levels of co-creation influences buyer's trust positively.*

#### 2.4.5 Co-creation & relationship strength

Relationship strength is defined in this study as the extent of close bonds between the buyer and seller arising from interactions in the marketing exchange. The buyer's perception reflects the evaluation of the strength of the relationship between buyer and seller (Ballantyne, 2004; Barnes, 1997; Granovetter, 1973; Lundkvist & Yaklef, 2004). This definition is a bounded view of relationship strength in that it focuses purely on the perceived degree of attachment, tie, connection or glue existing between the buyer and seller as a consequence of the marketing exchange. If the attachment between the buyer and seller are perceived as close, then relationship strength is deemed strong and conversely relationship strength is considered weak if the attachment between the buyer and seller are distant. Figure 2.4 shows co-creation generates relationship strength between buyer and seller.

Figure 2.4 Co-creation and relationship strength



The service dominant logic (SDL) and service-logic (Gronroos, 1994) perspectives frame co-creation in a relational context and suggest that co-creation generates both tangible and intangible outcomes (Berghman et al., 2006; Payne et al., 2008; Seybold, 2001; Vargo & Lusch, 2004a; Zerbini et al., 2007). One intangible outcome of co-creation is the development of stronger bonds between the buyer and seller. The interaction and dialogue that arises in co-creation is conducive to engendering strong

buyer-seller relationships. Additionally, co-creation through personalisation in interactions and in specific customised problem-solving solutions may facilitate closer and stronger buyer-seller relationships (Claycomb & Martin, 2001). Support for the link between co-creation and stronger relationships is provided by Boyle (2008), who suggests that co-creation in the consumption of brand meanings, generates customer-brand relationships. Although there are many inferences in the literature that co-creation generates relationship strength, there are currently no empirical studies that have tested the association between co-creation and relationship strength; hence the investigation of this path in the conceptual research model is a contribution to marketing knowledge. Therefore, the hypothesis for the path between co-creation and relationship strength is stated as follows:

*H3 Higher levels of co-creation influences buyer's relationship strength with the seller positively.*

#### 2.4.6 Trust & relationship strength

Figure 2.5 Trust and relationship strength

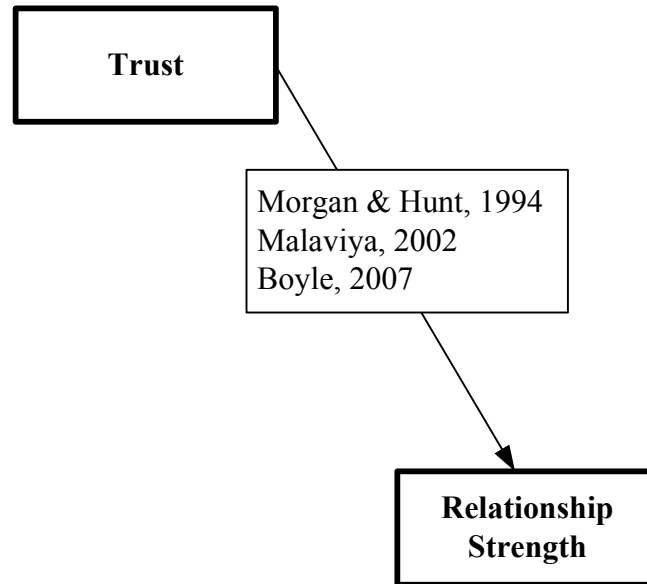


Figure 2.5 shows the conceptualised relationship between trust and relationship strength in the research model. The key mediating variable (KMV) model (Morgan & Hunt, 1994) demonstrates that trust is an important contributor to the development of the buyer-seller relationship. More recently, there is support to show that co-creation induces trust between the buyer and seller, and that trust contributes to strong bonds between the buyer and seller (Boyle, 2007; Malaviya & Spargo, 2002; Mascarenhas et al., 2004). While the pathway between trust and relationship strength has been conceptualised in a co-creation context there are no empirical studies that have tested this path in a co-creation context. This research offer the opportunity to empirically test whether trust contributes to forging relational bonds with the seller. Hence, the hypothesis from this path is as follows:

*H5 Trust in the seller influences relationship strength positively*

#### 2.4.7 Satisfaction & relationship strength

Figure 2.6 Satisfaction and relationship strength

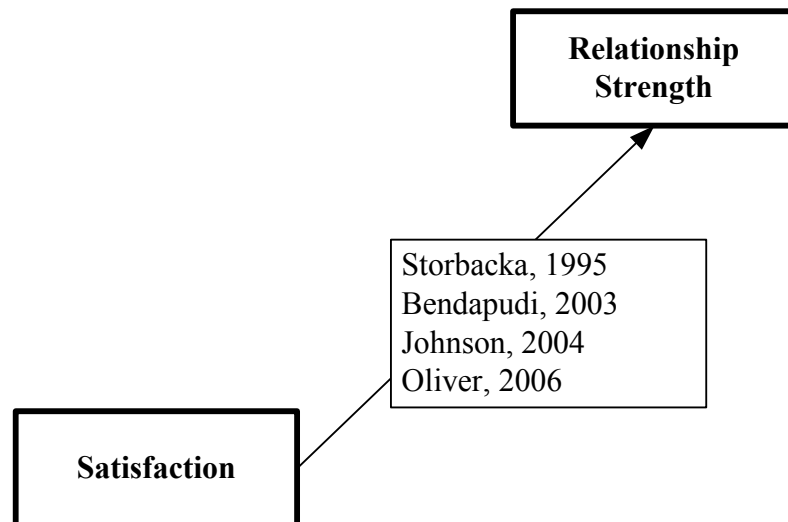


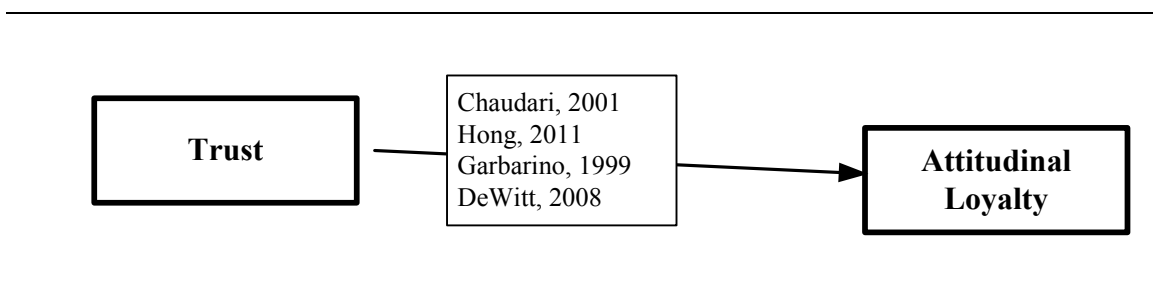
Figure 2.6 shows the conceptualised relationship between satisfaction and relationship strength in the research model. When co-creation delivers a positive customer solution, the buyer may experience high levels of satisfaction as hypothesised earlier. The high satisfaction levels from the positive buyer experience may contribute to the buyer wanting to develop stronger relationships with the seller for future co-creation marketing exchanges. Thus, highly satisfied customers may want to forge stronger relationships with the buyer. One empirical study investigating the association between customer participation and satisfaction shows reduced levels of self-serving bias when customer participation occurs in a relational context (Bendapudi & Leone, 2003). A recent empirical study exploring co-creation in a service recovery context extends this finding and show positive associations between co-creation, satisfaction and customer loyalty (Dong et al., 2008). Fleming et al. (2003) add that customer engagement generates emotional satisfaction and emotionally satisfied customers display both higher levels of customer loyalty and reduced switching behaviour compared to

rationally satisfied customers (Fleming, Coffman, & Harter, 2005). Positive customer loyalty and a low rate of switching behaviour indicate strong buyer-seller relationships. The service quality literature further adds that satisfaction contributes to the strength of the customer-marketer relationship (Claycomb & Martin, 2001; Storbacka, Strandvik, & Gronroos, 1995). From this it is inferred that positive satisfaction levels arising from a co-creation contributes positively to stronger buyer-seller relationship strength as in Figure 2.6. The hypothesis from this path is stated as follows:

*H6 Buyer's satisfaction influences relationship strength positively*

#### 2.4.8 Trust and attitudinal loyalty

Figure 2.7 Trust and attitudinal loyalty



The conceptual pathway in Figure 2.7 hypothesises that trust generated from co-creation directly influences the path to attitudinal loyalty. Garbarino et al.,(1999) in their study show that the trust construct has a direct effect on attitudinal loyalty. In a more recent study (Hong & Cho, 2011) state the influence of trust on attitudinal loyalty is also direct. Both these studies suggest that trust contributes to relationship building efforts and, hence higher levels of trust contribute positively to attitudinal loyalty. Similar empirical support is found in the branding literature where brand trust contributes positively to attitudinal loyalty (Chaudhuri & Holbrook, 2001). Additional corroborating support comes from a study on service recovery which shows similar

empirical support for the direct relationship between trust on attitudinal loyalty (DeWitt, Nguyen, & Marshall, 2008). Hence, the evidence set out, provides the basis for stating a hypothesis that trust arising from higher level of co-creation contributes to positive attitudinal loyalty. Hence the next hypothesis for the study is framed as follows:

*H7 Buyer's trust in the seller influences attitudinal loyalty positively.*

#### 2.4.9 Satisfaction and attitudinal loyalty

Figure 2.8 Satisfaction and attitudinal loyalty

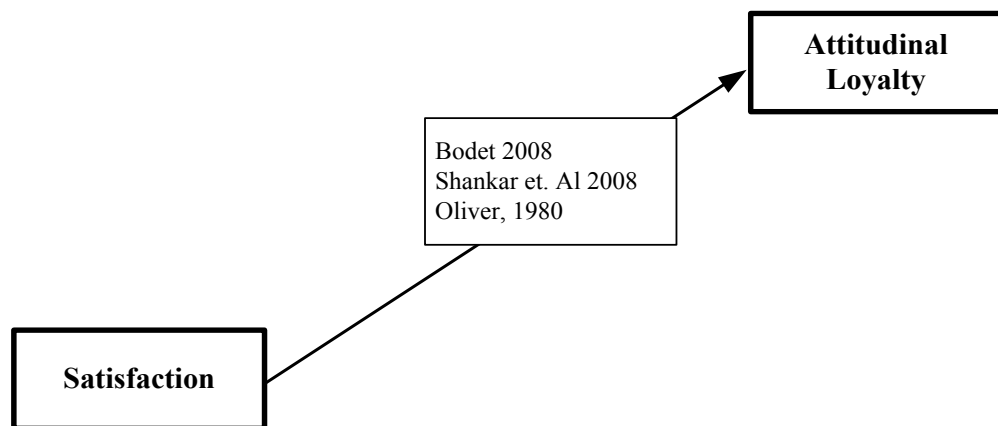


Figure 2.8 hypothesises that satisfaction influences attitudinal loyalty positively. One early study shows satisfaction contributes to positive attitudinal loyalty (Oliver, 1980). A more recent study (Bodet, 2008) finds a similar support for the link between satisfaction and attitudinal loyalty. The satisfaction to attitudinal loyalty link appears to be similar for both online and offline contexts (Shankar, Smith, & Rangaswamy, 2003). These results seem to suggest that satisfaction with the performance of an offering or seller generates positive psychological disposition culminating in positive attitudinal loyalty. Transposing this logic, it is hypothesised that high satisfaction arising from co-



creation generates positive attitudinal loyalty. Hence the hypothesis from this causal link between satisfaction and attitudinal loyalty is framed as follows:

*H11 Buyer's satisfaction with the seller influences attitudinal loyalty positively.*

#### 2.4.10 Satisfaction and trust

Figure 2.9 Satisfaction and trust

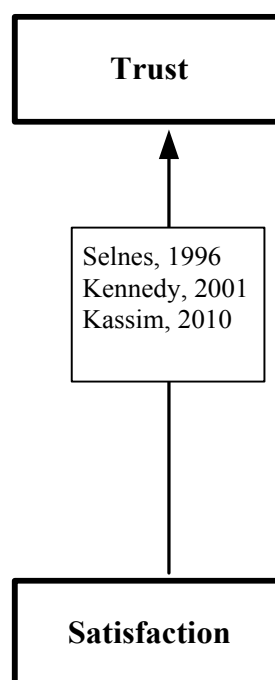


Figure 2.9 hypothesises that satisfaction contributes directly to generating trust. The engendering of trust between a buyer and seller is viewed as a pathway to developing buyer-seller relationships. Hence the trust construct is viewed as a relational construct. Selnes (1996) in his study found satisfaction was an antecedent to the trust construct. Other studies in a B2B context (Kennedy, Ferrell, & LeClair, 2001) and an online setting (Kassim & Abdullah, 2010) have also found similar results that satisfaction appears in an antecedent relationship to the trust construct. In the context of

the present study, the implication from this evidence is that high satisfaction from co-creation may generate positive trust levels for the buyer. Hence the hypotheses from the link between satisfaction and trust are stated as follow:

*H4 Buyer's satisfaction influences trust positively*

#### 2.4.11 Satisfaction and behavioural loyalty

Figure 2.10 Satisfaction and behavioural loyalty

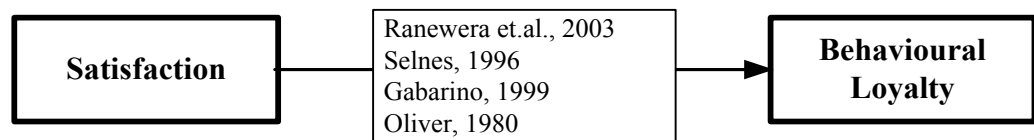


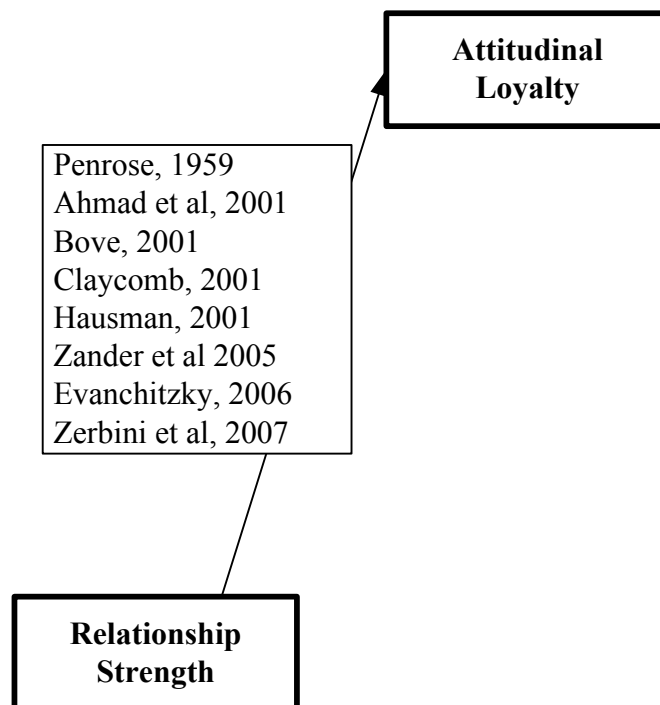
Figure 2.10 hypothesises that satisfaction influences behavioural loyalty positively. Two studies (Garbarino & Johnson, 1999; Selnes, 1998) show that that behavioural loyalty arises directly from high satisfaction levels. These views are echoed by others (Oliver, 1980; Ranaweera & Prabhu, 2003) who find similar empirical support for the link between satisfaction and behavioural loyalty. What this means in the context of the current study is that high satisfaction levels contributes to higher levels of behavioural loyalty. Therefore, the hypothesis from this causal path is framed as follow:

*H8 Buyer's satisfaction influences behavioural loyalty positively*

#### 2.4.12 Relationship strength & attitudinal loyalty

Attitudinal loyalty in this study is conceptualised as the customer's perception of the degree of favourable mental or psychological disposition towards the seller (Bandyopadhyay & Martell, 2007; Butcher, Sparks, & O'Callaghan, 2001; Evanschitzky, Iyer, Plassman, Niessing, & Meffert, 2006; Odin, Odin, & Valette-Florence, 2001; Pritchard, Havitz, & Howard, 1999; Söderlund, 2006)

Figure 2.11 Relationship strength and attitudinal loyalty



The conceptual pathway between relationship strength and attitudinal loyalty in Figure 2.11 hypothesises that higher levels of co-creation generate stronger relationships between the buyer and seller, which contributes to positive attitudinal loyalty. Customer loyalty has been studied in marketing both as a single composite customer loyalty variable and, more recently, has been thought to comprise of the separate components of attitudinal and behavioural loyalty (Dick & Basu, 1994). Dick & Basu (1994) suggest

that the appraisal of customer loyalty in terms of two components of attitudinal and behavioural loyalty components is a more precise way of understanding customer loyalty. As suggested, this study models customer loyalty as the separate constructs of attitudinal and behavioural loyalty.

There is support for the view that strong buyer-seller relationships contribute to customer loyalty (Evanschitzky et al., 2006). Therefore this logic suggests that the relationship strength construct is antecedent to the customer loyalty construct and the strength of the relationship between buyer and seller will influence the degree of customer loyalty (Bove & Johnson, 2001; Hausman, 2001). The contention here is that relationship strength is an antecedent of customer loyalty and represents an important linking construct between co-creation and customer loyalty.

The strength of the relationship between buyer and seller arises from the bonds, attachments and ties generated in the marketing exchanges between the buyer and seller (Ahmad & Buttle, 2001; Shammout, Polonsky, & Edwardson, 2011). Buyer and seller ties are developed through the generation of financial, social and structural bonds in the marketing exchange. Further evidence suggests that social and structural bonds within the buyer-seller relationships generates customer loyalty and prevents switching behaviour (Penrose, 1959; Zander & Zander, 2005). A recent study demonstrates that structural bonds are the strongest of the three types of bonds in generating customer, while financial bonds are the weakest (Ahmad & Buttle, 2001; Shammout et al., 2011).

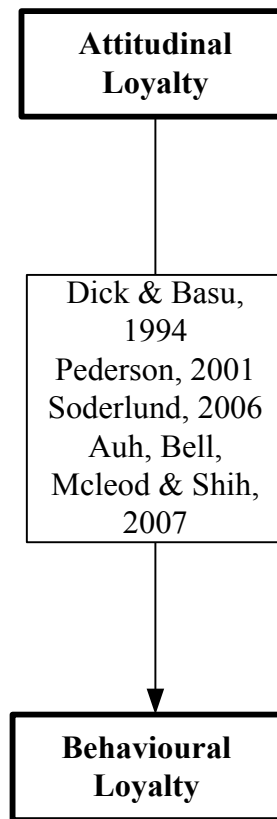
Co-creation between buyer-seller engenders interactions, dialogue, pooling of competencies and resources to generate the customer solutions. The sharing of resources, interactions and dialogue generates a favourable atmosphere for the development of social and structural bonds between the buyer and seller. Hence co-created exchanges between buyer and seller engender strong ties, attachment and positive psychological disposition of both the buyer and seller toward each other in the

relationship. Thus co-creation between the buyer and seller through the interactions, dialogue and joint problem-solving generates intangible benefits of strong ties and favourable attitudes of both parties in the relationship toward each other (Berghman et al., 2006; Zerbini et al., 2007). There is recent evidence to demonstrate the causal association between co-creation and attitudinal and behavioural loyalty (Auh et al., 2007). This study shows strong associations between co-production and attitudinal loyalty and weak associations between co-production and behavioural loyalty (Auh et al., 2007). Further there is recent conceptual evidence to suggest that co-creation generates positive attitudes towards the product and generates stronger buyer-seller relationships. This enables an inference that co-creation contributes to positive attitudinal loyalty towards the seller (Hoyer et al., 2010). Therefore this study hypothesises that strong buyer-seller relationships arising from co-creation contributes to positive attitudinal loyalty.

*H9 Relationship strength between buyer and seller influences attitudinal loyalty positively*

#### 2.4.13 Attitudinal loyalty & behavioural loyalty

Figure 2.12 Attitudinal loyalty and behavioural loyalty



Behavioural loyalty measures the strength of the customer's propensity to purchase from the selling company (Mittal & Kamakura, 2001; Swanson & Kelley, 2001). Repurchase intentions are adopted as a proxy for measuring behavioural loyalty in the experimental scenarios in this study.

The conceptual pathway in Figure 2.12 hypothesises that higher levels of co-creation contribute to positive attitudinal loyalty and attitudinal loyalty has a direct effect on behavioural loyalty. Results of an exploratory study on co-creation and customer loyalty provide support for the link between co-creation and customer loyalty (Dong et al., 2008). However the study (Dong et al., 2008) models customer loyalty as a single composite construct. Dick & Basu (1994) and others (Pedersen & Nysveen, 2001;

Söderlund, 2006) suggest that customer loyalty measurement has greater precision if the customer loyalty construct is measured as separate constructs of attitudinal and behavioural loyalty rather than as a single composite customer loyalty construct. A recent empirical study on co-production tests the relationships between co-production, attitudinal and behavioural loyalty in a limited high-credence service context (Auh et al., 2007). The results in this study show that co-production is significantly associated with attitudinal loyalty but not with behavioural loyalty, however the path to behavioural loyalty is directly influenced by attitudinal loyalty (Auh et al., 2007). Although the independent construct in this study (Auh et al., 2007) is co-production, the result offers a basis to make the link between co-creation, attitudinal and behavioural loyalty for this study. Therefore it is hypothesised that attitudinal loyalty has a direct effect on behavioural loyalty in the research model

*H10 Buyer's attitudinal loyalty generates positive behavioural loyalty*

#### 2.3.14 Investigating co-creation in multiple business contexts

The aim of a multiple business context study is to assess whether co-creation is generalisable over a wider range of business situations. Co-creation is conceptualised in a range of business settings. For example co-creation is framed in service contexts such as tertiary education (Dann, 2008; Kotze & du Plessis, 2003), financial services (Auh et al., 2007), hospitality, tourism (Binkhorst & Den Dekker, 2009) and retail settings (Edmonds, 2008), as well as in the manufacturing of tangible products (Andreu, Sánchez, & Mele, 2010; Bartl, Jawecki, & Wiegandt, 2010; Dahlsten, 2004), computer mediated settings (Nambisan & Baron, 2009), B2B markets (Goodrich & Aiman-Smith, 2007) and B2C markets (Andreu et al., 2010). The issue of the relevance of the business settings underscores the generalisability of co-creation. Anecdotal evidence suggests that co-creation is potentially applicable in a broad range of business settings. This

study draws selects a number of business settings to assess first, if co-creation and its outcomes are generalisable across multiple business contexts and, second, to ascertain if the outcomes of co-creation are similar or differ across the business contexts.

The first context for this study is a comparison of whether the outcomes of co-creation in the B2B and B2C contexts are similar or different. The evidence suggests that buyer-seller interaction, collaboration and joint problem solving is prevalent in B2B markets (Hoyer et al., 2010; Penrose, 1959; Zander & Zander, 2005; Zerbini et al., 2007). There is a suggestion that B2C markets are evolving and demonstrating similar features of B2B markets, such as customer empowerment, wider availability and access to information is democratising the relationship between buyer and seller (Füller, Mühlbacher, Matzler, & Jawecki, 2009; Niininen et al., 2007; Ouschan et al., 2006; Wikstrom, 1996a). These evolutionary changes in B2C markets suggest that interactions, collaboration and joint problem solving are becoming as relevant for B2C market contexts as they are in B2B markets. Therefore, the first contextual assessment in this study is assessing whether the outcomes of co-creation differ for B2B and B2C markets (Hoyer et al., 2010).

*H12 Co-creation's influence on marketing outcomes is invariant across the B2B and B2C market contexts.*

The second contextual assessment of co-creation for this study focuses on whether the outcomes of tangible product or services co-creation are similar or different. The service dominant logic perspective views that differentiating an offering as tangible products or intangible services diverts the focus away from the fundamental issue in marketing, which is the problem solving solution of an offering whether it be a tangible or intangible offering. The SDL view suggests that the divide between a tangible product offering and intangible service is a red herring. The SDL perspective presents co-creation as a mechanism that shifts the focus on to the problem solving solution



instead of a focus on the difference between a tangible product or intangible service offering (Vargo & Lusch, 2004a). The SDL suggestion on the irrelevance of distinguishing between a tangible product and intangible service offering presents the second business context for this study, which is to investigate whether or not the outcomes of co-creation are similar or different for tangible product or intangible service offerings in the context of thesis's study.

*H13 Co-creation's influence on marketing outcomes is invariant across product and service contexts.*

## 2.5 Chapter conclusion

This chapter reports on the theoretical underpinnings for co-creation, constructs a causal research model linking co-creation to marketing outcomes, provides a rationale for the choice of business settings, sets out the research questions, and specific research hypotheses. The next chapter details and justifies a quasi-experimental research design for this dual-phased research.

## CHAPTER 3: OVERALL RESEARCH DESIGN

Table 3.1 Chapter 3 outline

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3.1 Introduction
↓
3.2 Overall research design
↓
3.3 Methods and procedures
↓
3.4 Chapter conclusion

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### 3.1 Introduction

Chapter 3 covers the following issues in the choice and rationale of an appropriate methodology for both the pilot and main study. First, chapter 3 identifies the ontological and epistemological approach, second, it describes the selection of a research design consistent with the ontology and epistemology selected and, third, it discusses the procedures used to collect and analyse the data in this study.

This research is a dual-stage study. The first stage is a pilot, while the second stage is the main phase of the study. The purpose of the pilot study is an initial exploration of the causal relationships between the independent co-creation variable and the dependent variables in the research model and, provides an indication of the reliability and validity of the measures adopted to measure the independent and dependent constructs in the research model. The aim of the second stage main study is to present both theoretical and empirical advancements drawn from an assessment of the findings in the pilot study.

### 3.2 Overall research design

Research design is defined as a detailed plan to operationalise an empirical study (Creswell, 2009; Crotty, 1998). This study falls into an objective positivist perspective. The specific rationale for adopting a positivist research design for this is set out below. First, co-creation in marketing is an emerging area of research, and early empirical research on co-creation has inclined towards qualitative research designs in investigating the co-creation concept (Cecez-Kecmanovic, 2001; Edvardsson et al., 2005; Ottensen et al., 2005). Therefore the choice of a positivist research design for this study provides an alternative lens to evaluate co-creation. The choice of a positivist research design as an alternative research design for studying co-creation and its outcomes in this study provides verification of the results of earlier studies of co-creation.

Conceptual studies on co-creation suggest causal relationships between co-creation and marketing outcomes (Malaviya & Spargo, 2002; Mascarenhas et al., 2004; Prahalad & Ramaswamy, 2003; Sheth et al., 2000; Vargo & Lusch, 2004a). A positivist research design is an established method to evaluate causal relationships between constructs. Cresswell (2009) suggests a positivist research design is appropriate when cause and effect relationships between constructs are hypothesised or when the aim of the investigation is to discover how different levels of the independent construct may influence the dependent constructs. Thus, both these counts fit the positivist stance adopted in this study.

While there are a few empirical studies studying co-production, customer participation and customer collaboration using positivist research design emerging in the literature, there is to-date no empirical study that has developed a measurement scale for the co-creation construct. One contribution of this study is the development of a multi-item measurement scale for the co-creation construct. A positivist research design is thus

congruent with the adoption of multi-item measurement scales to operationalise the constructs in the research model.

Testing the causal paths between the co-creation and marketing outcome constructs requires measurement scales for both the independent co-creation and the dependent marketing outcome constructs in the research model. While it is the intention of this study to contribute to the development of a measurement scale for co-creation, this study also relies on adopting validated measurement scales for the dependent constructs. In this regard, the existing literature provides validated measurement scales for all the dependent constructs except relationship strength. Table 3.2 summarises the key features of the positivist research design for this study. The second column of Table 3.2 shows that how the ontology, epistemology, research design and, the analytical methods and procedures relate to the pilot and main study.

Finally, Cresswell (2009) suggests that the choice of research design is also affected by the personal ontology of the researcher, so long as the choice of research design is appropriate for the research problem at hand. It is reported that the personal ontology of the researcher in this study is positivist. Given the discussion thus far the adoption of a positivist research design seems most appropriate for this study.

Table 3.2 Guidelines for choice of research design for study

Ontology Assumptions on the nature of reality	Objective and external physical and social reality informed by internal realism
Epistemology Assumptions on how to investigate phenomenon based on the nature of reality adopted	Positivism Researcher is independent Investigating cause and effect relationships in research model Research model based on a theoretical model as presented in chapter 2 Research to verify or falsify hypotheses based on theoretical research model Constructs to be operationalised as multi-items scales Large sample size for both pilot and main study Clear identification of unit of analysis. The unit of analysis is the individual customer
Research Design operational plan to carry out empirical research	Quasi- experimental design Study One - pilot study- to explore the relationships between the construct in the research model Study Two– follow-up confirmatory study of the relationships between constructs in research model Causal research design Cross-sectional experimental design for both the pilot study & main study Research hypotheses framed from research questions from theoretical model Verification of hypotheses
Methods & Procedures specific techniques adopted in empirical research in process of collecting and analysing data	Data collection via role-playing experimental scenarios and survey questionnaire Multi-item measurement scales of constructs in research model Unit of analysis Sampling frame for the pilot study – student participants, between-groups study Study Two – real customers, within-subjects study Large sample size pilot study n =177 student participants Study Two n = 290 participants with 563 data-points Data analysis using confirmatory factor analysis and structural equation modelling techniques
(Crotty, 1998; Easterby-Smith, Thorpe, & Lowe, 2002; Orlikowski & Baroud, 1991)	

### 3.3 Methods and procedures

#### 3.3.1 Quasi-experimental research design

The justification for an experimental approach for the current research is first, an experimental design fits within the positivist research tradition (Crotty, 1998; Orlikowski & Baroud, 1991). Second, the research models for both studies shows causal relationships between the independent co-creation construct and the multiple dependents of satisfaction, trust, relationship strength, attitudinal and behavioural loyalty (Lynn & Lynn, 2003; Orlikowski & Baroud, 1991). Finally, both studies adopt a cross-sectional design, using a large sample of participants to investigate the relationships between the independent and dependent constructs in the research model. An experimental research design is appropriate when complex relationships between variables are investigated and or when the phenomenon is difficult to replicate (Lynn & Lynn, 2003; Suprenant & Churchill Jr, 1984). Since the meaning of co-creation lacks clarity (Frow et al., 2011), quasi-experiments are adopted to generate a consistent representation of co-creation for the participants of the quasi-experiments. The adoption of role-playing experimental scenarios provides consistency to vary the degree of co-creation in each level of the treatments in the role-playing experimental scenarios. This means that participants of the role-playing scenarios receive consistent perspectives of the idea of co-creation in each level of co-creation and across the multiple-co-creation experimental business contexts. Thus the quasi-experiments provide a systematic and unbiased means of collecting data for co-creation and its outcomes from participants. The quasi-experiment comprise of a role-playing co-creation scenario in a purchase context. Three levels of co-creation are generated in the same purchase context and each participant evaluates one level of a co-creation context.

Table 3.3 Quasi-experimental research design for pilot and main study

	Pilot study	Main study
Type of experiment	Quasi-experiment Factorial design quasi-experiment One-shot post-test experimental research design Cross-sectional study Between group study Classroom setting	Quasi-experiment Factorial design quasi-experiment One-shot post-test experimental design Cross-sectional study Within-subjects study Field setting

The pilot study adopts between-subjects, single context experimental research design, where levels of co-creation are varied in three scenarios with a common theme. The main study gathers data from a larger sample and adopts a within-subjects research design in multiple-co-creation contexts. The selection of multiple contexts enables assessment of whether co-creation has similar outcomes in different business contexts. Both studies are factorial design, quasi-experiments. The primary conditions of a factorial design are that independent variables are manipulated systematically and that the dependent variables are objectively and quantitatively measured. Participants take part in the experiments by performing specific tasks in the experiments and strict experimental protocols are observed in carrying out the experiments (Adelman, 1991).

There is no attempt in either study to take before-and-after measurements. This technique carries with it great difficulties concerning contamination of the outcomes as participants get to understand what the researcher is seeking. Rather, both studies employ a single-shot approach where a large sample size is presumed to allow for any initial differences in impressions of individuals, and post-hoc differences in the values of dependent variables are attributed to participants' reactions to the variation in the experimental stimuli. Hence, both studies adopt a cross-sectional, factorial, one shot

post-test, quasi-experimental design. Table 3.3 summarises the main features of the quasi-experimental research design for the pilot and main study.

The procedures for research design presents evidence of internal validity in the design of the data collecting research instruments for both studies. Specific details of procedures for satisfying internal and external validity in the research instruments for data collection are reported in detail in chapter 5 of this thesis.

### 3.3.2 Sampling

Table 3.4 Sampling frame

	Pilot study	Main study
Sampling features	Convenience sample Student participants Sample size n=177	Convenience sample Purposive criterion-based sample Employee from a wide range of organisation in New Zealand, Sample frame comprising of 290 participants yielding 563 data-points

Table 3.4 summarises the sampling frame for both studies. A convenience sampling procedure is adopted for both studies. Participants for the pilot study comprise of university students. The sample frame for the pilot study is of moderate size comprising of 177 student participants. The participants for the main study comprise of employees from a wider range of organisations in New Zealand. The sample frame consists of 290 employees. As the main study is a within-subjects study, each participant evaluates two experimental scenarios in two different business contexts. Therefore the 290 participants provide 580 datasets for analysis in the main study. However, 17 of these questionnaire responses were incomplete and therefore not included in the dataset for the main study. The rationale for the sampling frame for both studies is detailed and justified in chapter 4 (Research design, data analysis and



discussion of the pilot study) and chapter 5 (Research design in the main study) respectively

### 3.3.3 Experimental materials & procedures

Table 3.5 Experimental materials

	Pilot study	Main study
Experimental materials	Role-playing experimental scenario in single context with 3 treatment levels	Role playing experimental scenarios in multiple contexts (4 scenarios with 3 levels of treatments for each experimental context)
	Self-report survey questionnaire containing multi-item measurement scales representing independent and dependent constructs	Self-report survey questionnaire containing multi-item measurement scales representing independent and dependent constructs

The quasi-experiments for both studies are operationalised by means of role-playing experimental scenarios. As suggested earlier, such experiments are an appropriate technique to represent a phenomenon that is complex and difficult to replicate (Suprenant & Churchill Jr, 1984; Trevino, 1992; Weber, 1992). Role-playing experimental scenarios provide an objective and systematic approach to varying the independent variable (customer co-creation) for both studies in this research. Note that the three levels of co-creation captured within the scenarios are used to measure the perceived level of co-creation for each participant. A self-report survey questionnaire, comprising multi-item measurement scales of the constructs in the research model, measures the participants' perceptions of the constructs contained in the role-playing experimental scenarios. Table 3.5 summarises the experimental procedures for both studies. An in-depth discussion of the design of role-playing experimental scenarios, development of measurement scales and protocols for administering the quasi-

experiments to participants is reported in chapter 4 (pilot study) and chapter 5 (main study).

### 3.3.4 Analytical methods

Table 3.6 Methods and procedures for pilot study & main study

	Pilot study	Main study
Analytical Methods	Confirmatory factor analysis Structural equation modelling	Confirmatory factor analysis Structural equation modelling Multi-group invariance analysis

The relationships between the constructs in the research models in both studies show multiple independent and dependent causal relationships between the constructs used in the research models. In this circumstance, (Hair, Black, Babin, Anderson, & Tatham, 2006) suggest that structural equation modelling (SEM) is an appropriate analytical technique to analyse the multiple relationships between the constructs in the research models for the pilot and main study.

The key advantages of the SEM analytical method are that it is able to simultaneously estimate regression equations in multiple independent-dependent relationships, account for measurement error and, facilitate the measurement of latent constructs represented in the conceptual research models for the pilot study and the main study (Byrne, 2001; Schumacker & Lomax, 2004).

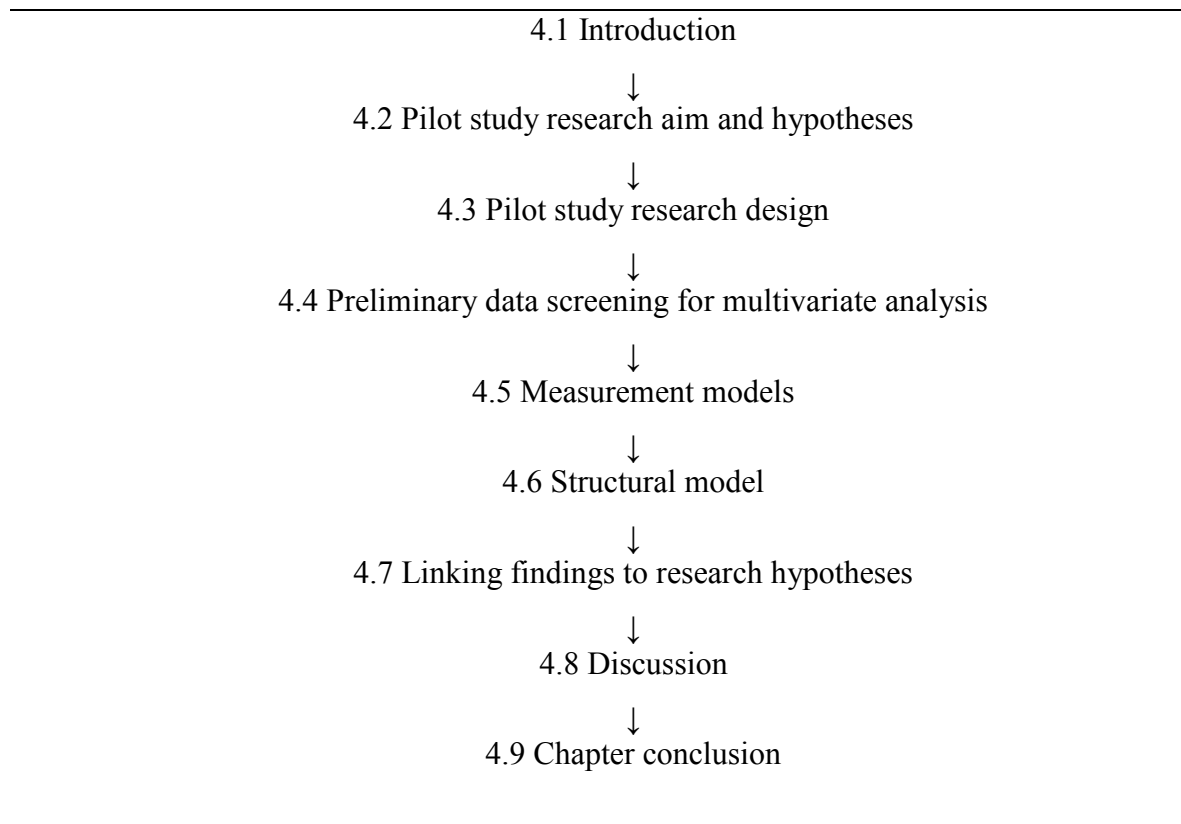
Anderson & Gerbing (1988) *inter alia* recommend a two-step procedure where the estimations of a measurement model through CFA is made prior to the estimation of a structural model. This procedure ensures the estimation of the structural model is based on sound reliability and validity of the measurement of the independent and dependent constructs in the research model. The AMOS 17.0 structural equation modelling software package is used to estimate the measurement and structural models for both studies.

### 3.4 Chapter conclusion

Chapter 3 builds the research design framework to operationalise the conceptual research model discussed in Chapter 2. This chapter provides an overall rationale for the adoption of positivist quasi-experimental research design. Chapter 4 reports on the specific research design issues for the data analysis and findings of the pilot study. Chapter 4 also provides a discussion of the results and theoretical rationale for the findings in the same study and, offers both theoretical and research design improvements for the follow-up, main- study

## CHAPTER FOUR: PILOT STUDY

Table 4.1 Chapter 4 outline



### 4.1 Introduction

This chapter reports on the research design, findings and discussion of the findings of the pilot study. The purpose of this pilot study is to investigate the integrity of the hypothesised variables in the conceptual research model and to test the theorised relationships between co-creation and marketing outcomes constructs. The research has been published as a stand-alone study, as, “Rajah, Edwin, Marshall, Roger, & Nam, Inwoo. (2008), ‘Relationship glue: Customers and marketers co-creating a purchase experience,’ in *Advances in Consumer Research* Volume 35, Eds. Angela Y. Lee and Dilip Soman, Duluth, MN : Association for Consumer Research, Pages: 367-373.” The findings in the pilot study provide directions to theoretically refine and iteratively improve the research design for the main study.

## 4.2 Pilot study research aim and hypotheses

The research aim for the pilot study is to ascertain to what extent higher levels of co-creation affect relational outcomes of satisfaction, trust, relationship strength, attitudinal loyalty and behavioural loyalty. Figure 4.1 and, Table 4.2 present the research model and hypotheses for the pilot study.

Figure 4.1 Pilot study research model

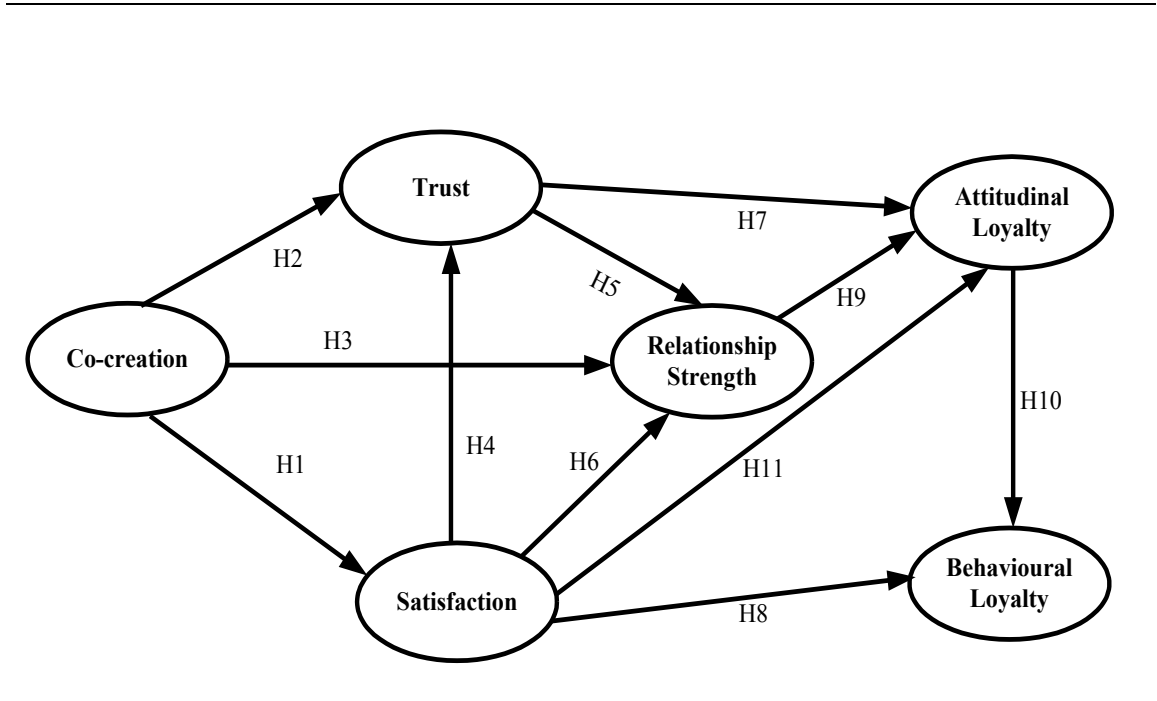


Table 4.2 Pilot study research hypotheses

H1	Higher levels of co-creation influences buyer's satisfaction positively
H2	Higher levels of co-creation influences buyer's trust positively
H3	Higher levels of co-creation influences buyer's relationships strength with the seller positively
H4	Buyer's satisfaction influences trust positively
H5	Trust in the seller influences relationship strength positively
H6	Buyer's satisfaction influences relationship strength positively
H7	Buyer's trust in the seller influences attitudinal loyalty positively

H8	Buyer's satisfaction influences behavioural loyalty positively
H9	Relationship strength between the buyer and seller influences attitudinal loyalty positively
H10	Buyer's attitudinal loyalty generates positive behavioural loyalty
H11	Buyer's satisfaction with the seller influences attitudinal loyalty positively

### 4.3 Pilot study research design

#### 4.3.1 Quasi-experimental research design

The research design for the pilot study is a cross-sectional, one-shot post-test, factorial quasi-experimental research design (Adelman, 1991). The participants for the pilot study are drawn from a convenience sample of students in a classroom setting. The pilot study is a between-subjects study in that each participant evaluates a single role-playing experimental scenario in a service purchase setting (Field, 2005; Malhotra, Hall, Shaw, & Oppenheim, 2002; Smith & Albaum, 2005).

#### 4.3.2 Sample

The pilot study draws on a convenience sample of participants. As this does not permit random allocation of the experiments to participants, the experiments in the pilot Study are considered quasi-experiments. The participants are undergraduate university students in a research methodology class completing the measurement instruments during class time. The dataset consists of data from 177 undergraduate participants, with an approximately even gender split. The instructor had ethical approval for collection of data in this manner as long as the work formed an integral part of the students' course.

Lynn & Lynn (2003) and Winer (1999) suggest that external validity is compromised when a student sample is used in an experimental study on the basis that student participants are not typical customers. However this caveat against the use of a

student sample is countered if the product offering in the experiments is one that a student would in fact purchase (Shuptrine, 1975). It is contended in the present study that university students represent a segment of the market for the purchase of airline tickets and hence, provides a logical reason for the use of student sample in the pilot study. Thus these precedents in the literature lend support to show it is acceptable practice to use students in a pilot study (Hughes & Gibson, 1991).

#### 4.3.3 Materials, measurement scales and procedures

##### *Materials*

The experiments given to participants in the study are in the form of role-playing experimental scenarios in a business-to-consumer (B2C) travel service context. The topic of the experimental scenarios is of a customer working with a travel agent to arrive at a travel solution. This topic was selected as it is thought to be relevant to the student sample. There are three levels of treatment of the experimental scenarios (3 levels of treatments x 1 context). The three levels of treatments manipulate the degree of co-creation (independent variable) in each of the levels of the role-playing experimental scenarios as previously discussed.

The role-playing experimental scenarios describe the same purchasing situation for an identical airline booking, but each scenario contains a different level of co-creation. Each participant reads one of the experimental scenario treatments and places themselves in the context of the purchaser of the service in the experimental scenario.

The experimental treatments focus on manipulating the independent co-creation construct while keeping all other factors constant in the experimental scenarios. Co-creation is the manipulated dependent variable in the research model that provides the disturbance factor that will allow the effect of variations in co-creation upon downstream variables to be observed. At the end of the questionnaire each participant is given a short

statement explaining what co-creation is, and is then asked to assess the amount of co-creation present in this scenario to which he or she was exposed using a three item co-creation measurement scale. This yields a subjective measure of perceived co-creation, which is a appropriate means to measure co-creation in the present context.

Tables 4.3, 4.4 and 4.5 present each of the high, moderate and low co-creation experimental treatments as provided to the student sample in the pilot study. The different levels of co-creation are shown in the italicised text in each of the experimental scenarios. Appendix 1A, 1B and 1C presents copies of the experimental scenarios as presented to participants in the pilot study.

Table 4.3 High co-creation experimental treatment

Please read this little story, and then answer the questions below, Thanks!

Imagine that you have been invited to stay in London with your married, older brother for a two-week holiday. The accommodation is, of course, free, and the prospect of an early summer holiday very attractive. There seems no problem, as the School has a between-semester break and your kindly brother has sent some cash toward the tickets. Quite excited, you try booking your flights on-line, but it proves really hard and, anyway, you don't have a credit card so it would be impossible to pay on-line. So, off to the travel agent you go. Your friend has recommended an excellent agent situated in Holland Village; you have your travel dates all sorted out and ring the agency; John Tan answers and you make an appointment to see him.

*When you arrive at the agency, John seems nice enough, and greets you with a smile. After chatting in general about your fabulous holiday offer, you tell John the days you wish to travel and ask him for the cheapest return ticket. John turns to his computer and, a few minutes later, produces a list of four flights leaving that day for London. John turns to his computer and, a few minutes later, produces a list of four flights leaving that day for London. Of the four airlines the cheapest one is leaving at 8.00 in the morning, and another two leave late but get into London very early in the morning indeed. Qantas have a flight leaving at 11.00 in the morning, so you don't have to arrive at the airport at an uncivilized, early hour, but it is slightly more expensive than the less convenient flights. You discuss this with John and decide that the Qantas flight is the best choice, priced at \$1,506.00. You ask for a window seat and John brings up the aircraft seating plan on his console and turns it so you can see. You then discuss the relative merits of being on the escape hatch row near the kitchen versus another row away from the kitchen and toilets but with less leg-room. You decide on the escape-hatch row and John secures seat 34A for you, for both the outward and return flights. Finally, John assures you that he has noted your requirement for vegetarian food.*

You leave the agency feeling very pleased with your purchase.



Table 4.4 Moderate co-creation experimental treatment

Please read this little story, and then answer the questions below, Thanks!

Imagine that you have been invited to stay in London with your married, older brother for a two-week holiday. The accommodation is, of course, free, and the prospect of an early summer holiday very attractive. There seems no problem, as the School has a between-semester break and your kindly brother has sent some cash toward the tickets. Quite excited, you try booking your flights on-line, but it proves really hard and, anyway, you don't have a credit card so it would be impossible to pay on-line. So, off to the travel agent you go. Your friend has recommended an excellent agent situated in Holland Village; you have your travel dates all sorted out and ring the agency; John Tan answers and you make an appointment to see him.

*When you arrive at the agency, John seems nice enough, and greets you with a smile. After chatting in general about your fabulous holiday offer, you tell John the days you wish to travel and ask him for the cheapest return ticket. John turns to his computer and, a few minutes later, produces a list of four flights leaving that day for London. Of the four airlines the cheapest one is leaving at 8.00 in the morning, and another two leave late but get into London very early in the morning indeed. Qantas have a flight leaving at 11.00 in the morning, so you don't have to arrive at the airport at an uncivilized, early hour, but it is slightly more expensive than the less convenient flights. You discuss this with John and decide that the Qantas flight is the best choice, priced at \$1,506.00. You ask for a window seat and, after checking, John finds seat 34A for you, for both the outward and return flights. Finally, John assures you that he has noted your requirement for vegetarian food.*

You leave the agency feeling very pleased with your purchase.

Table 4.5 Low co-creation experimental treatment

Please read this little story, and then answer the questions below, Thanks!

Imagine that you have been invited to stay in London with your married, older brother for a two-week holiday. The accommodation is, of course, free, and the prospect of an early summer holiday very attractive. There seems no problem, as the School has a between-semester break and your kindly brother has sent some cash toward the tickets. Quite excited, you try booking your flights on-line, but it proves really hard and, anyway, you don't have a credit card so it would be impossible to pay on-line. So, off to the travel agent you go. Your friend has recommended an excellent agent situated in Holland Village; you have your travel dates all sorted out and ring the agency; John Tan answers and you make an appointment to see him.

*When you arrive at the agency, John seems nice enough, and greets you with a smile. After chatting in general about your fabulous holiday offer, you tell John the days you wish to travel and ask him for the cheapest return ticket. John has no hesitation and states that Qantas have a flight that morning, priced at a very reasonable \$1,506.00. It leaves at 11.00 in the morning and so you don't have to arrive at the airport at an uncivilized, early hour. You ask for a window seat and, after checking, John finds seat 34A for you, for both the outward and return flights. Finally, John assures you that he has noted your requirement for vegetarian food.*

You leave the agency feeling very pleased with your purchase.

#### *Procedure*

After reading the experimental scenario each participant subsequently completes a self-report survey questionnaire. The questions and statements in the self-report survey questionnaire in the pilot study contain multi-item measurement scales pertaining to each of the constructs in the research model for the pilot study. The multi-item measurement scales assesses participants' perceptions of co-creation and other dependent variables in the research model. The self-report survey questionnaire consists of a series of statements and phrases on a seven point Likert scales.

#### *Measurement scales*

The measurement scales for all the constructs in the pilot study are multi-item measurement scales. All the constructs in the pilot study research model, apart, from co-creation, relationship strength and behavioural loyalty adopt validated measurement

scales. The construct definitions as outlined in chapter 2 and summarised in Table 5.12 provide direction for selection of appropriate measurement scales for the dependent constructs. Satisfaction is measured as a cumulative overall measure and, hence the satisfaction scale as adopted by Ranaweera (2003) satisfies this requirement. Trust in the pilot study adopts the Morgan & Hunt definition of trust and hence, Morgan & Hunt's 3 item parsimonious scale trust scale as adopted in Ranaweera's (2003) study provide the scales for the trust construct. Dick and Basu (1994) suggest that the measurement of loyalty is more accurate if measured separately as attitudinal and behavioural loyalty constructs. Accordingly measurement scales reflecting the attitudinal loyalty construct are drawn from the literature (Ganesh, Arnold, & Reynolds, 2000). Behavioural loyalty in the pilot study is defined and measured as purchase intentions hence, two purchase intention scale items are drawn from the Cronin et al (2000) study and 2 items from the Ganesh et al study to provide the battery of scale items for behavioural loyalty. The sources of the validated measurement scales are as follows; Satisfaction (3 items) (Ranaweera & Prabhu, 2003), trust (3 items) (Ranaweera & Prabhu, 2003), attitudinal loyalty (3 items) (Ganesh et al., 2000) and behavioural loyalty (4 items) (Cronin, Brady, & Hult, 2000) (Ganesh et al., 2000). From a synthesis of the literature two three-item measurement scales for co-creation and relationship strength are developed. The 3 scale items for the co-creation construct reflect some of the strands of co-creation in the analysis of the literature in Table 2.3 and the construct definition of co-creation synthesised from the literature reported in chapter 2. Likewise, a 3 item scale for relationship strength is developed for the pilot study. The relationship scale is a bounded view of relationship as it provides an overall measure of the bonds between buyer and seller as perceived by the buyer.

Table 4.6 below shows the scale items and sources for all the variables in the model. Appendix 2 presents the self-report survey questionnaire as provided to participants in the pilot study.

Table 4.6 Measurement scales items for constructs in the pilot study

Constructs		
Attitudinal Loyalty (Ganesh et al., 2000)	I would highly recommend my travel agent to my friends and family.....	AL1
	I am likely to make positive comments about my travel agent to my friends and family.....	AL2
	In the future I intend to use more of the services offered by my travel agent.....	AL3
Behavioural Loyalty (Cronin et al., 2000; Ganesh et al., 2000)	The probability that I will use this service again in future is very high.....	BL1
	If I had to do it over again, I would still engage this travel agency.....	BL2
	I intend to continue using my travel agency over some time.....	BL3
	As long as the present service continues, I doubt that I would use this travel agent.....	BL4
Relationship Strength (new scale developed for pilot study)	My relationship to this specific travel agent is very strong.....	RS1
	My relationship to this specific travel agent is very important to me.....	RS2
	My relationship to this specific travel agent is something I really care about.....	RS3
Satisfaction (Ranaweera & Prabhu, 2003)	Overall, I am pleased with the services offered by my travel agent.....	S1
	The services offered by my travel agent meet my expectations.....	S2
	I think I did the right thing when I took up the services provided by this travel agent.....	S3

Trust (Ranaweera & Prabhu, 2003)	In our relationship, my travel agent can be counted to do what is right.....	T1
	In our relationship, my travel agent has high integrity.....	T2
	In our relationship, my travel agent can be trusted at all times.....	T3
Co-creation (new scale developed for pilot study)	The company really went out of its way to work with the customer.....	CC1
	The final purchase solution was arrived at mainly through the joint effort of the company and the customer.....	CC2
	I would describe the situation described as a very high level of purchasing co-creation.....	CC3

#### 4.3.4 Analytical Methods

Hair et al (2006) suggest that structural equation modelling (SEM) is an appropriate technique to analyse the causal relationships, between constructs, such as those in this research model. Anderson & Gerbing (1988) *inter alia* recommend a two-step procedure for the application of the SEM analytical tool. Step 1 requires the estimation of a measurement model through confirmatory factor analysis. This step establishes statistical support for the reliability and validity of the measurement scales. Establishing good empirical support for the measurement model allows the researcher to empirically estimate the structural model. The AMOS 17.0 structural equation modelling software package is used to analyse the relationships in the research model. The key advantages of the SEM analytical method are that it is able to simultaneously estimate regression equations in multiple independent-dependent relationships, account for measurement error and facilitate the measurement of latent constructs represented in the conceptual research model. (Byrne, 2001; Schumacker & Lomax, 2004).

## 4.4 Preliminary data screening for multivariate analysis

### 4.4.1 Checking normal distributions

Two methods are employed to assess the pattern of normal distributions for the measurement scale items in the dataset. The first approach is by visual inspections of the histogram graphs produced by the SPSS descriptive “explore” procedure. The graphs provide a visual indication of the extent of skewness and kurtosis in the dataset. The extent of the deviations of skewness and kurtosis from the normal distribution indicates the extent to which the dataset satisfies the normal distribution assumption. The visual inspection of the pattern of normal distribution for each measurement scale item in the dataset reveals some degree of non-normality for some of the measurement scale items. The histograms for assessing normal distribution for the measurement scale items in the dataset are presented in Appendix 3.

The second approach for screening the dataset to inspect for normality is by calculating Z scores for skewness and kurtosis, and comparing the Z-scores with a recommended cut-off benchmark. A “Z score” is a standardised score with a mean of zero; Field (2005) suggests that a score of  $\pm 1.96$  indicates non-normality in the relevant distribution. Appendix 4 shows the Z-scores, supporting the visual inspections of the histograms. Some of the measurement scale items are within the prescribed benchmark of  $\pm$  one standard deviation, while a few are skewed.

Byrne (2001) suggests that non-normal distributions are fairly typical of real-world data. Additionally, other authors (Tabachnick & Fidell, 2007) suggest that non-normality of data arising from skewness is not a problem for multivariate analysis unless it is extreme. Despite some degree of non-normality in the dataset, the stipulations by (Byrne, 2001) (Tabachnick & Fidell, 2007) provide support for

proceeding with multivariate confirmatory and structural modelling analysis of the dataset.

#### 4.4.2 Reliability analysis

The measurement scale items representing constructs are assessed for internal consistency and their reliability are shown in Table 4.7. Cronbach's Alpha is used to measure measurement scale reliability, where a score of above 0.7 is considered satisfactory (Nunnally, 1978).

Table 4.7 Reliability statistics

Constructs N = 177	Cronbach's Alpha	No. of Items
Trust	0.66	3
Customer Loyalty	0.89	7
Relationship Strength	0.82	2
Satisfaction	0.79	3
Co-Creation	0.82	3

The Cronbach's Alpha coefficient for the newly developed, three-item scale for Co-creation is 0.82. Relationship strength has also never yet been directly measured and reported in the literature. One of the measurement scale items (item RS1) does not contribute to the scale and was thus dropped; the remaining two items (RS2 & RS3) are highly correlated with a correlation coefficient of 0.82. All other measurement scales are drawn from validated scales, and all perform well with the exception of Trust (three items drawn from (Ranaweera & Prabhu, 2003). The reliability analysis indicates a lower than the recommended benchmark of 0.7 for the Trust construct (Alpha = .66), but, as all items contribute to the Alpha score and are well established, a considered judgment is taken to retain the scale without deleting any of the measurement scale items for the trust construct. Additionally, Nunally (1978), suggests a slightly lower cut-off of

0.6 for exploratory analysis provides further support for retaining all the scale items for the Trust construct.

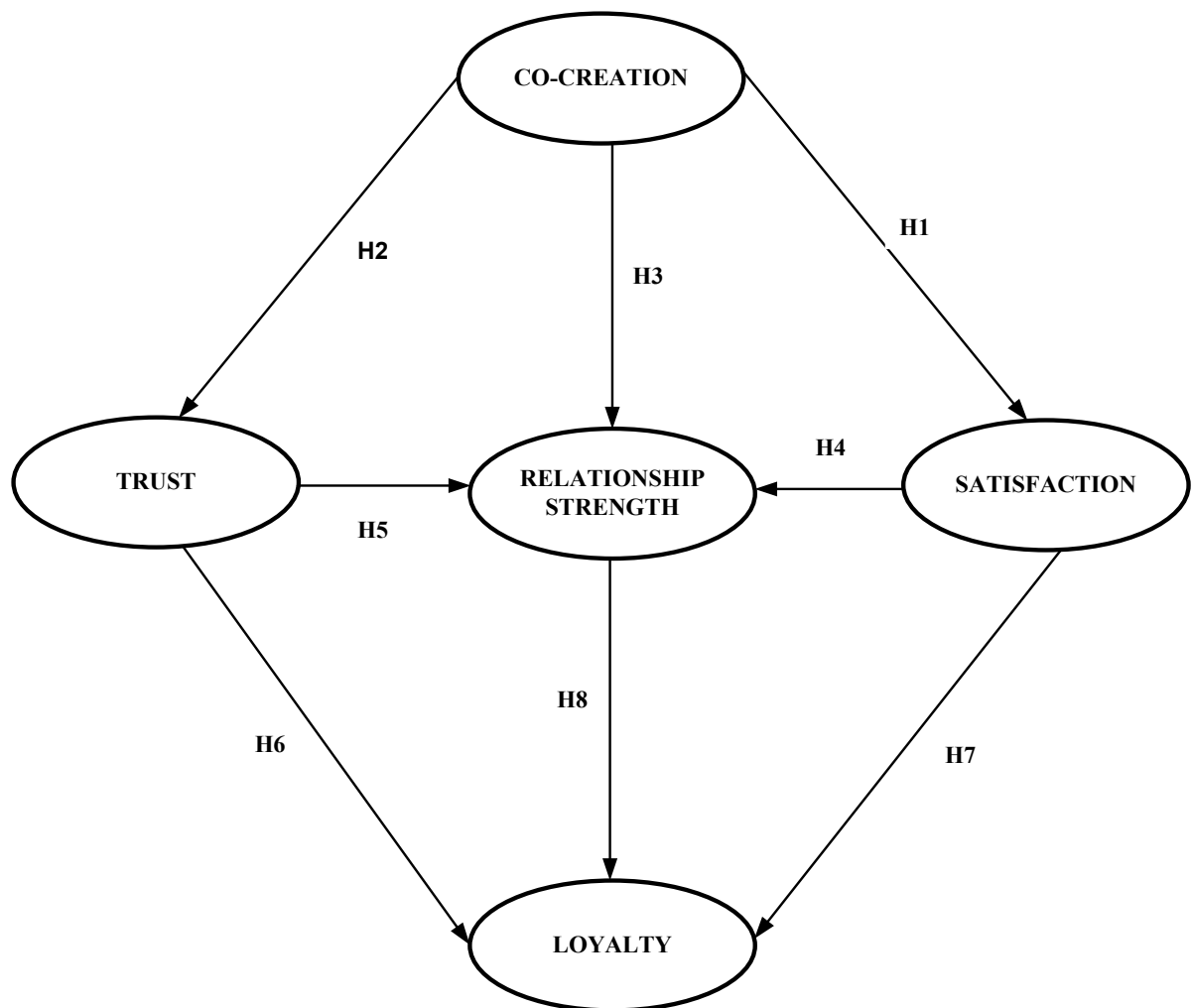
Loyalty is measured by seven items. Four are behavioural loyalty items (Cronin et al., 2000) (Ganesh et al., 2000), and three attitudinal loyalty items (Ganesh et al., 2000). the alpha for the composite Loyalty variable is .881. Initially these two aspects of loyalty were to stand as separate constructs in the research model, but their correlations are too high to allow SEM modelling, hence these loyalty measures are merged into a single customer loyalty variable. There is support in the literature to show that loyalty is operationalised as separate constructs of attitudinal and behavioural loyalty, as well a single composite customer loyalty construct (Dick & Basu, 1994; Dong et al., 2008; Pedersen & Nysveen, 2001). Additionally, loyalty is one of number of a dependent constructs in the research model, hence the merging of the loyalty construct into a single composite construct will still provide direction for deriving a better understanding of the causal links between co-creation and the dependent constructs. With this amendment to the loyalty construct, the revised conceptual model and research hypotheses for the pilot study are reflected below in Table 4.8 and Figure 4.2.

Table 4.8 Pilot study revised research hypotheses

H1	Higher levels of co-creation influences buyer's satisfaction positively
H2	Higher levels of co-creation influences buyer's trust positively
H3	Higher levels of co-creation influences buyer's relationships strength with the seller positively
H4	Buyer's satisfaction influences relationship strength positively
H5	Trust in the seller influences buyer's relationship strength positively
H6	Buyer's trust in the seller influences buyer's loyalty positively
H7	Buyer's satisfaction influences buyer's loyalty positively
H8	Relationship strength between buyer and seller influences loyalty positively



Figure 4.2 Pilot study revised conceptual model



#### 4.5 Measurement models

Prior to analysing the causal paths between the independent co-creation construct and dependent variables, confirmatory factor analysis (CFA) is undertaken to validate the measurement scales for the constructs. Two first order measurement models are generated using the maximum likelihood extraction procedure in AMOS 17.0 with fit statistics as shown in Table 4.9 and, Figures 4.3 and 4.4. Model 1 is for co-creation, satisfaction and the trust constructs as shown in Figure 4.3, and Model 2 is for the relationship strength and composite customer loyalty constructs as shown in Figure 4.4.

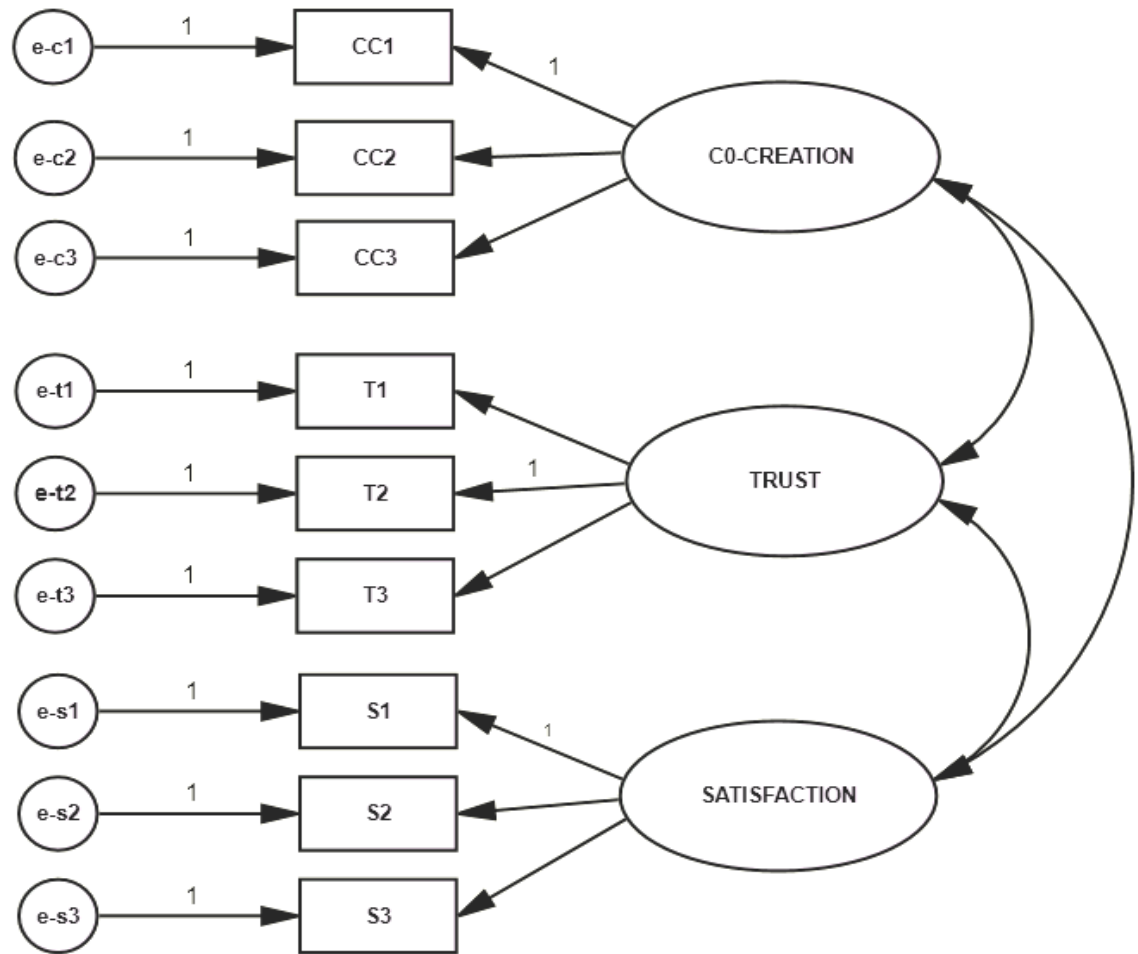
Table 4.9 Measurement model fit statistics

	Model	GFI	AGFI	CMIN/DF	SRMR	RMSEA
Model 1	CC/Satisfaction/Trust	0.958	0.925	1.46	.040	.051
Model 2	Relationship strength /loyalty	0.878	0.787	3.85	.064	.127

Table 4.10 Selected criteria to assess SEM model fit

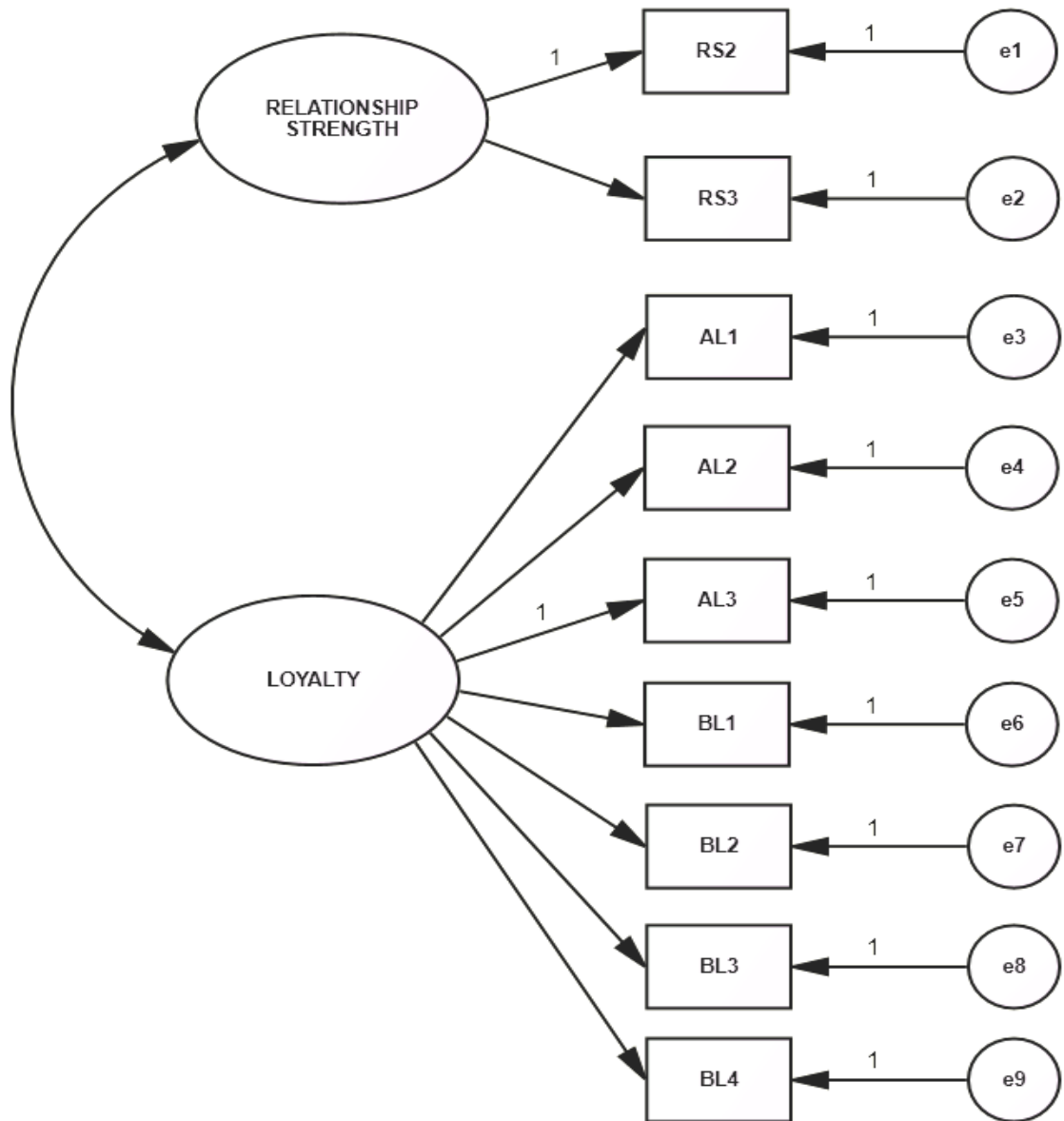
Criteria	Acceptable Fit Thresholds
Normed Chi-square (Chi square/df)	Between 1.0 -3.0
Probability value for chi-square	$p > 0.05$
Goodness of Fit (GFI)	$p > 0.90$
Adjusted Goodness of Fit (AGFI)	$p > 0.90$
SRMR	$p < 0.05$
RMSEA	$p < 0.08$
Source: (Hair et al., 2006)	

Figure 4.3 Measurement model for co-creation, trust and satisfaction constructs



Note CC1, CC2, CC3 are scale items representing the co-creation construct, T1, T2 & T3 are scale items representing the trust construct and, S1, S2 & S3 represent scale items for the satisfaction constructs

Figure 4.4 Measurement model for relationship strength and loyalty constructs



Note RS2 & RS3 are scale items representing the relationship strength construct, AL1, AL2 & AL3, BL1, BL2, BL3 & BL4 are scale items representing the composite loyalty in the revised research model in Figure 4.2

The comparison of the fit statistics for measurement model 1 as shown in Table 4.9 against the recommended thresholds in Table 4.10 shows good fit for measurement model, and just marginal fit for measurement model 2. The fit statistics for

measurement model 2 show the normed chi-square of 3.85, GFI and SRMR fit statistics indicate just marginal fit. The assessment of the regression parameter estimates in Table 4.11 and 4.12 show the regression estimates are significant and the standard errors are within acceptable limits. The results of the analysis of the structural model are reported in the next section.

Table 4.11 CFA for latent variables measurement model 1 – regression weights

			Estimate	S.E	C.R.	P value
CC3	←	Co-creation	1.242	.146	8.439	< .001
CC2	←	Co-creation	1.042	.122	8.409	< .001
CC1	←	Co-creation	1.000			
T2	←	Trust	1.000			
T1	←	Trust	1.052	.146	7.212	< .001
T3	←	Trust	0.956	.176	5.447	< .001
S1	←	Satisfaction	1.000			
S2	←	Satisfaction	1.017	.116	8.738	< .001
S3	←	Satisfaction	1.219	.138	8.825	< .001

Table 4.12 CFA for latent variables model 2 – regression weights

			Estimate	S.E	C.R.	P value
RS2	←	Relationship strength	1.000			
RS3	←	Relationship strength	1.011	.156	6.463	< .001
AL1	←	Loyalty	.804	.094	8.545	< .001
AL2	←	Loyalty	.761	.088	8.615	< .001
AL3	←	Loyalty	1.000			
BL1	←	Loyalty	.931	.092	10.148	< .001
BL2	←	Loyalty	1.292	.113	11.404	< .001
BL3	←	Loyalty	1.189	.107	11.144	< .001
BL4	←	Loyalty	.899	.124	7.246	< .001

#### 4.6 Structural model

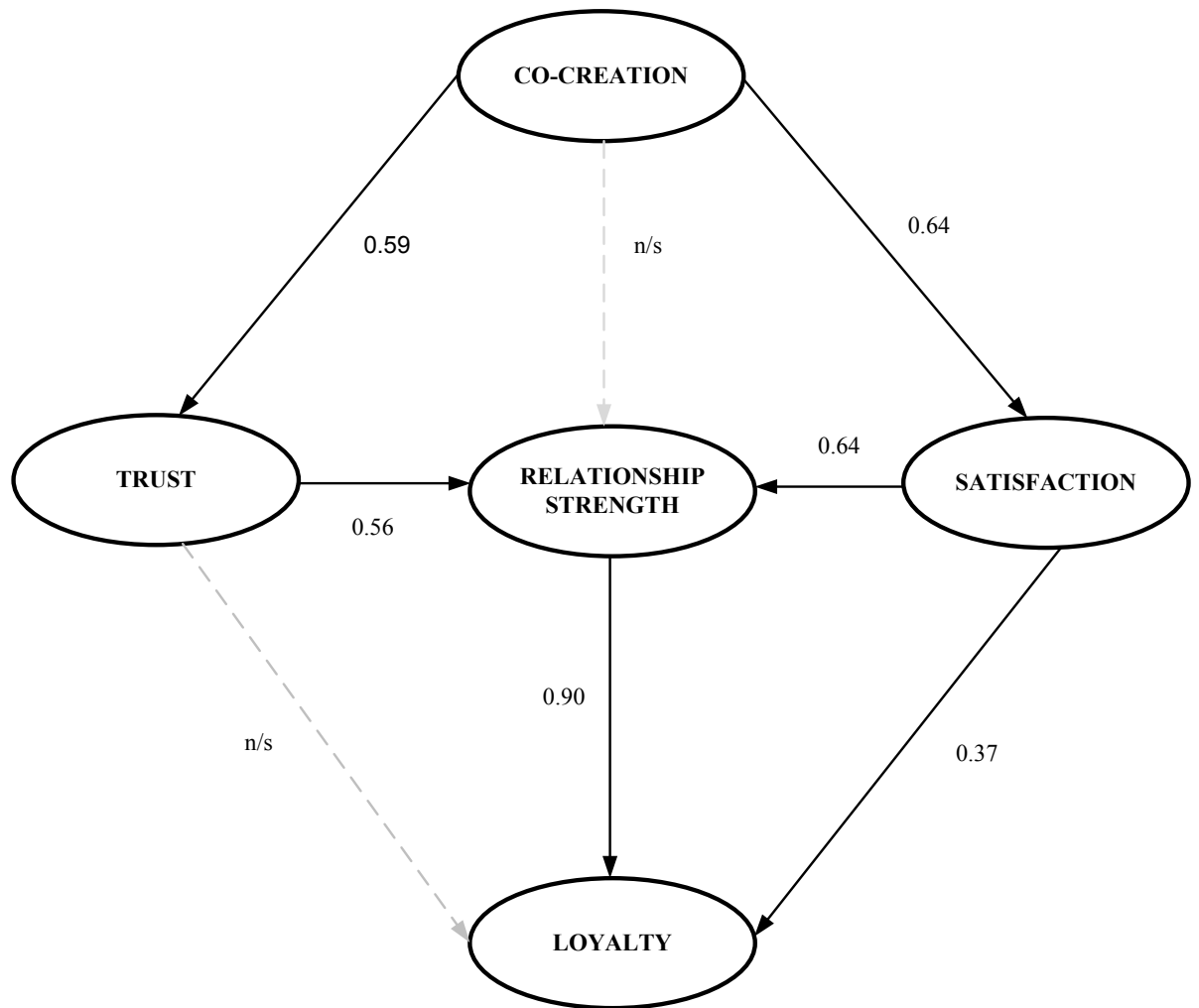
A Maximum Likelihood estimation method is initially used to extract the structural model for the revised research model in Figure 4.2. The structural model with the maximum likelihood extraction method generates a structural model with marginal global fit statistics ( $GFI = .829$ ,  $AGFI = .762$ ,  $CMIN/DF = 2.99$ ,  $RMSEA = 1.07$ ). These statistics place the fit of the structural model at the lower end of an acceptable structural model, even for a model using only 177 responses. Further inspection of structural model fit statistics reveals a multivariate kurtosis value of 82.5; a Mardia's coefficient value in excess of 1.96 indicates a problem with multivariate normality. Even a cursory consideration of the distributions of the variables in the model shows that most are severely leptokurtic

In this circumstance, enlarging the sample by bootstrapping is one solution, another is not to massage the sample statistics, but to use an Unweighted Least Squares estimation method. Although this method does not yield a Chi square statistic, it does operate well regardless of the scales' non-normality (Long & Brekke, 1999). The consequent global fit statistics for the structural model are all well within the thresholds of a good model fit ( $GFI = .963$ ,  $AGFI = .949$ ,  $NFI = .947$ ,  $CMIN/DF = 2.20$ ). Figure 4.5 shows the structural model with standardised regression estimates.

The findings show significant direct path relationships between co-creation to trust, co-creation to satisfaction, relationship strength to loyalty, satisfaction to loyalty. Although the direct path from co-creation to relationship path is not significant, the indirect path from co-creation to relationship strength through the satisfaction and trust constructs shows a positive regression path estimate of 0.7. Likewise, the direct path between trust and loyalty is not significant, however the indirect path from the trust to the loyalty construct shows a positive regression path estimate of 0.504. The results of

the structural model and the standardised regression estimates are shown in Figure 4.5 below.

Figure 4.5 Structural model with standardised estimates



#### 4.7 Linking findings to research hypotheses

Figure 4.6 Structural model and hypotheses testing results

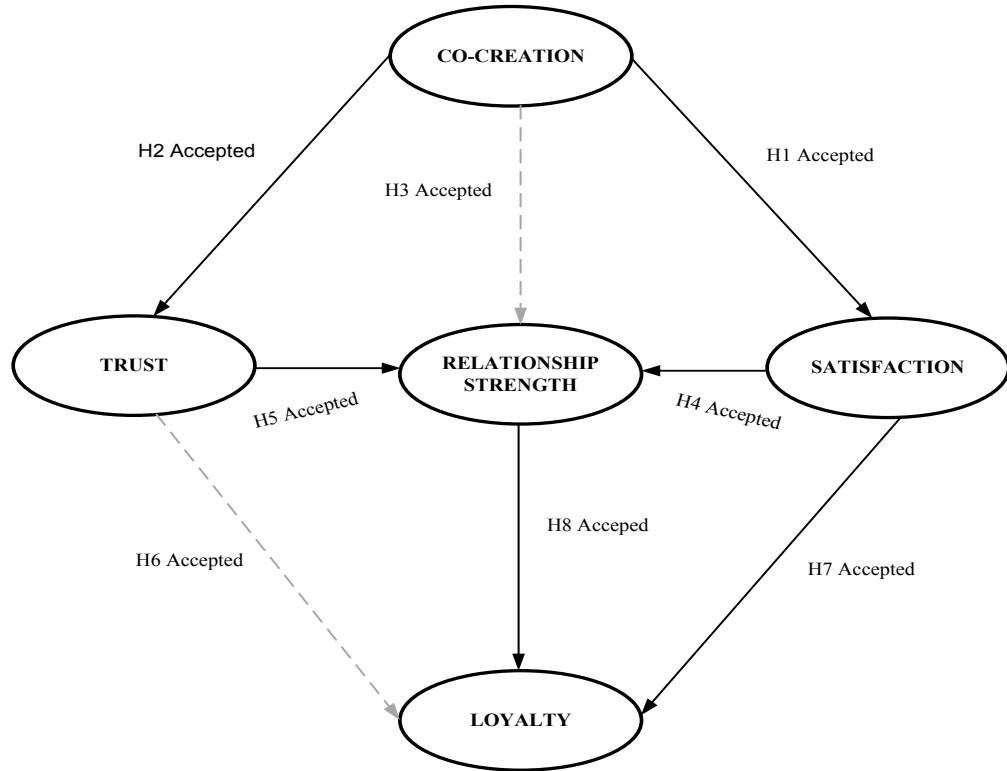


Table 4.13 Pilot study hypotheses testing results

	Hypothesis	Results
H1	Higher levels of co-creation influences buyer's satisfaction positively	Accepted
H2	Higher levels of co-creation influences buyer's trust positively	Accepted
H3	Higher levels of co-creation influences buyer's relationships strength with the seller positively	Accepted**
H4	Buyer's satisfaction positively influences relationship strength positively	Accepted
H5	Trust in the seller influences buyer's relationship strength positively	Accepted
H6	Buyer's trust in the seller influences buyer's loyalty positively	Accepted**



H7	Buyer's satisfaction with the seller influences buyer's loyalty positively	Accepted
H8	Relationship strength between the buyer and seller influences buyer loyalty positively	Accepted

\*\* Although the direct paths for the H3 and H6 hypotheses are not significant, the indirect paths estimates for both the H3 and H6 hypotheses are positive, hence both these hypotheses are accepted

The findings from the analysis of the structural model for the pilot study presented in Table 4.13 and Figure 4.6 shows that all hypotheses are accepted.

## 4.8 Discussion

### 4.8.1 Implications for theory

The findings in this preliminary study shows empirical support for the contention that changes in the level of co-creation influences multiple downstream marketing outcome constructs. Overall the results of the research show that the change in the levels of co-creation generates positive changes in satisfaction, trust, relationship strength and customer loyalty as postulated in the theoretical research model. In addition, this study contributes to marketing theory by developing measurement scales for the co-creation and relationship strength constructs.

Likewise, the empirical evidence here shows that relationship strength is an important intervening construct between co-creation, trust, satisfaction and loyalty construct, hence supporting the theoretical view that co-creation is framed in a relational setting (Vargo & Lusch, 2004b). The empirical evidence in the pilot study shows an indirect path relationship between the co-creation and relationship strength constructs, and an indirect path relationship between trust and loyalty constructs.

### 4.8.2 Implications for the main study

The overall conclusion from the pilot study is that the experimental manipulation show that different levels of co-creation has positive influences on downstream

marketing outcome constructs. Therefore, these findings provide a sound epistemological base for a larger follow-up confirmatory study. The experimental scenarios in the pilot study focus on a single B2C service context. It is relevant to find out if co-creation is generalisable in other business contexts, for example co-creation in a B2B, products and service business contexts. The application of co-creation in a variety of business contexts highlights the issue of generalisability, thus offering an opportunity for a follow-up confirmatory study.

The sample for the pilot study comprises a moderately large sample of undergraduate student ( $n = 177$ ). This sample size is adequate for SEM analysis. However, the findings show some degree of non-normality in the dataset. The less than normal distribution required the use of the ULS estimation method to generate the structural model for the pilot study (Long & Brekke, 1999). The main study is a follow-up confirmatory study with a larger non-student sample and multiple co-creation contexts, which provides the opportunity to develop a better understanding of the influence of co-creation on marketing outcomes.

The customer loyalty construct in the pilot study was initially postulated as separate constructs comprising of the attitudinal and behavioural loyalty constructs. However, the correlations between these constructs are too high to allow modelling them separately. The regression estimates for customer loyalty does suggest that this variable is an important dependent variable in the structural model. However, recent literature (Dick & Basu, 1994; Pedersen & Nysveen, 2001; Söderlund, 2006) suggests that customer loyalty is multi-dimensional construct and hence the follow-up study should investigate customer loyalty as separate constructs of attitudinal and behavioural loyalty.

Likewise the relationship strength construct is a new measurement scale developed for this study. Of the three measurement scale items, one scale item was deleted as it does not contribute to the internal consistency of the scale, leaving a two-item

measurement scale. In general terms it is not advisable to use two-item scales in structural equation modelling (Bhattacharjee, 2001), which may help explain the poor fit of the measurement model. Hence, the follow-up study requires developing and expanding the number of measurement scale items for the relationship strength construct.

Co-creation also uses a new measurement scale in this study; the three item measurement scale provides a robust measure for the construct. A search of the literature shows there are as yet no reported measurement scales for the co-creation construct, therefore this is a substantive issue that warrants further developmental work to refine and improve the co-creation measurement scale items for the follow-up confirmatory work in the main study.

#### 4.9 Chapter conclusion

The overall conclusion from the pilot study shows co-creation having positive effects on marketing outcome constructs in the research model. The positive results, while encouraging, are not generalisable across other contexts. Therefore the pilot study paves the way for a more generalisable study with enhanced constructs and measure development. The next chapter reports on the development of a research design for a follow-up study on co-creation and its outcomes.

## CHAPTER 5: RESEARCH DESIGN FOR MAIN STUDY

Table 5.1 Chapter outline

5.0 Introduction
↓
5.1 Recommended improvements from results of pilot study
↓
5.2 Research questions & hypotheses
↓
5.3 Quasi-experimental research design
↓
5.4 Sample
↓
5.5 Experimental materials and procedures
↓
5.6 Measurement scales
↓
5.7 Reliability
↓
5.8 Validity
↓
5.9 Analytical methods
↓
5.10 Ethics
↓
5.11 Chapter conclusion

### 5.0 Introduction

The discussion in the pilot study provides the direction for theoretical refinements and improvements for research design for the main study. This chapter reports on the experimental research design adopted in the main study.

## 5.1 Recommended improvements from results of pilot study

The results from the pilot study demonstrate that co-creation has positive outcomes on satisfaction, trust, and relationship strength and customer loyalty. Despite the overall positive results, the pilot study pointed to five limitations to be addressed in a future follow-up study. The five limitations are first, the research is based on a single business B2C/service experimental context and second, students were the participants in the study. Third, the degree of co-creation requires greater variation in the experimental treatments in a follow-up investigation, fourth, the results obtained suggest that the measurement scale items for the relationship strength construct require further refinements to better measure the relationship strength construct. Finally, the attitudinal and behavioural loyalty constructs need clarification (both these constructs were merged into a single loyalty construct, as there was insufficient separation between them in the pilot study).

The main study thus incorporates all five refinements in an improved research design. The selection of B2B and B2C market contexts and a service and product co-creation situation to broaden the research context is the first of the five improvements. Investigation of a range of business contexts provides the opportunity to assess the generalisability of the outcomes of co-creation in different business contexts. Generalisability of the outcomes of co-creation in multi-business contexts addresses the issue of the external validity for research (Han, Kwortnik, & Wang, 2008; Winer, 1999). The broadening of the co-creation contexts in the main study requires the development of four base experimental scenarios reflecting each of the business contexts.

To further improve on external validity of the results of the main study, the participants are employees from a wide range of organisation in New Zealand. The broader range in the profile of the sample population for the main study means that the assessment of co-creation taps broader segments of customers, thus enhancing the

potential for generalisation. The study obtains data from 290 employees from organisation in New Zealand, who provide a total of 563 completed survey questionnaires.

The third improvement in the research design pertains to accentuation of the co-creation contexts in the treatment levels of the experimental scenarios. The final research design refinement focuses on improvements to the measurement scales, to get better precision in measuring the independent co-creation construct and other dependent constructs in the research model. To obtain better precision for construct measurement, a synthesis of the literature sets out operational definitions for each of the constructs in the research model. The construct definitions subsequently provide direction for developing the measurement scales for constructs. To better measure the co-creation construct, the multiple measurement scale items for the co-creation construct from the pilot study are further improved and expanded and lined up with the operational definition of co-creation. Similarly, the domain of the constructs guide the selection of appropriate measurement scales for each the dependent constructs.

## 5.2 Research question and hypotheses

### 5.2.1 Research questions

The main study incorporates multiple business co-creation contexts to expand and broaden the research questions. The multiple business contexts are B2B and B2C co-creation contexts, and tangible and service co-creation contexts. Table 5.2 and Table 5.3 present the research questions, research model and research hypotheses for the main study.

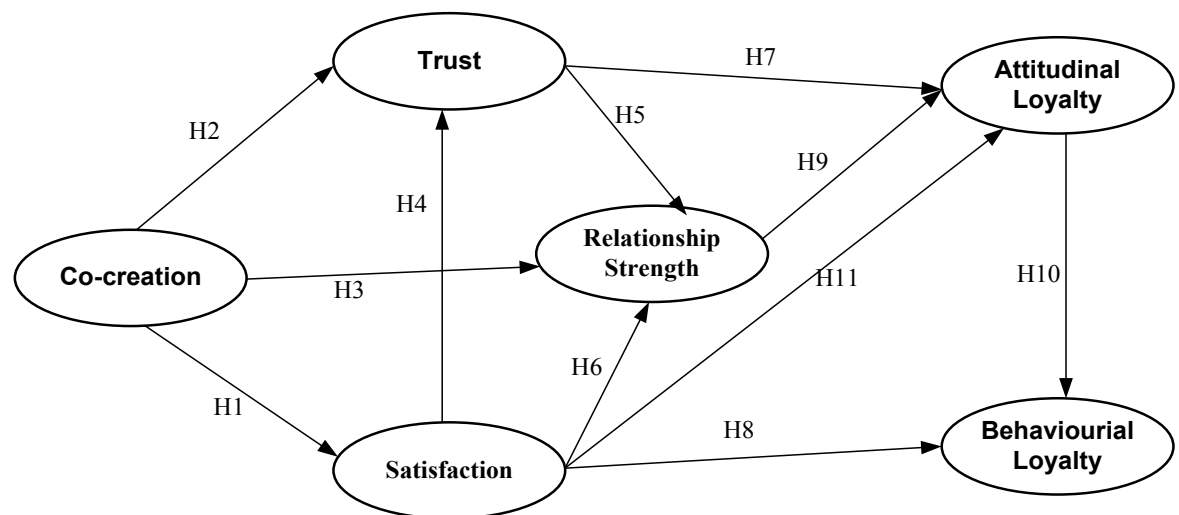
Table 5.2 shows research question 1 is the same research question addressed in the pilot study. The aim of the repetition is to conduct a larger, confirmatory, study of the research model explored in the pilot study. Research questions 2 and 3 are new

questions. These address the issue of whether co-creation generates different outcomes in each of the multiple business contexts in the main study, and hence address the issue of generalisability of the outcomes of co-creation in other business contexts.

Table 5.2 Research questions

Research question 1	To what extent do higher levels of co-creation affect marketing outcomes of satisfaction, trust, relationship strength, attitudinal loyalty and behavioural loyalty?
Research question 2	To what extent do higher levels of co-creation affect marketing outcomes in business-to-business (B2B) and business-to-consumer (B2C) market contexts?
Research question 3	To what extent do higher levels of co-creation affect marketing outcomes in product marketing and service marketing contexts?

Figure 5.1 Main study research model



### 5.2.2 Research hypotheses

The research hypotheses for the main study are presented in Table 5.3 below

Table 5.3 Research hypotheses

H1	Higher levels of co-creation influences buyer's satisfaction positively
H2	Higher levels of co-creation influences buyer's trust positively
H3	Higher levels of co-creation influences buyer's relationships strength with the seller positively
H4	Buyer's satisfaction influences trust positively
H5	Trust in the seller influences buyer's relationship strength positively
H6	Buyer's satisfaction influences relationship strength positively
H7	Buyer's trust in the seller influences attitudinal loyalty positively
H8	Buyer's satisfaction influences behavioural loyalty positively
H9	Relationship strength between buyer and seller influences attitudinal loyalty positively
H10	Buyer's attitudinal loyalty generates positive behavioural loyalty
H11	Buyer's satisfaction with the seller influences attitudinal loyalty positively
H12*	Co-creation's influence on marketing outcomes is invariant across the B2B and B2C market contexts*
H13*	Co-creation's influence on marketing outcomes is invariant across product and service contexts*

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*\* H12 and H13 hypotheses are drawn from research question 2 & 3*

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### 5.3 Quasi-experimental research design

The main study employs an experimental research design as in the pilot study.

The key research design differences between the pilot study and the main study are first, the main study is a within-subjects experimental design and, second, the sample size is larger (290 participants yielding 563 completed survey questionnaires. Third, the sample participants are employees, fourth, the main study incorporates multiple contexts



within the research design. Table 5.4 below summarises the key features of the new quasi-experimental research design.

Table 5.4 Features of experimental research design

Type of experiment	Quasi-experiment Factorial design quasi-experiment One-shot post-test experimental design Cross-sectional study Within-subjects study
Sample features	Convenience recruitment of participants Sample participants are employees Convenience-purposive based sample Field setting Sample size $n = 290$ yielding 563 data points
Experimental materials	Role playing experimental scenarios in multiple contexts 4 scenarios with three levels of treatments for each experiment context ( $3 \times 3 \times 4 = 36$ ) Self-report survey questionnaire

The main study is a cross sectional, one-shot, post-test, factorial quasi-experimental research design (Adelman, 1991). The experiments consist of experimental role-playing scenarios and, as the target sample participants are drawn from a convenience sample, the experiments fit into the category of a quasi-experiment (Harris et al., 2004; Lynn & Lynn, 2003). The main study is a within-subjects research design, in that each participant evaluates two experiments in two different co-creation contexts (Field & Hole, 2003; Malhotra et al., 2002; Smith & Albaum, 2005).

## 5.4 Sample

Table 5.5 Sampling plan

Define target population	Customers
↓ Develop sample frame	↓ Employees in companies drawn from Auckland region between period of June-July 2010
↓ Select sample design	↓ Convenience / purposive sampling/ within-subjects design/field experiments
↓ Determine size of sample	↓ CFA & SEM requires larger samples for data analysis Foster suggests 15-30 participants per dependent variable for confirmatory factor analysis
↓ Collect data	↓ 290 participants yielding 563 valid survey responses

### 5.4.1 Sampling plan

The target population for this study is customers for the purchase of a desktop computer and an airline ticket in B2B and B2C market contexts. Employees in organisations and companies form the sample population for the main study. The data collection from the sample population is the Auckland region and the data was collected between June to July 2010.

As this is a within-subjects study, the sampling frame requires each participant in the study to evaluate two experimental scenarios in different co-creation contexts. The advantages of a within-subjects study are that it provides greater sensitivity by mitigating the sources of random variation in the evaluation of the role-playing scenarios, and it is economical to carry out both in terms of the cost and speed of collecting the data. The disadvantages of a within-subjects study is that the participant may experience fatigue and carryover effects when participating in more than one role-

playing scenario in a short space of time. To mitigate the disadvantage of carryover effects, counterbalancing procedures provide one way of counteracting carryover effect. The specific procedure to counterbalance the role-playing scenarios and the order of the survey questionnaire is explained in detail in section 5.5 of this chapter (Field & Hole, 2003).

The sample frame comprised of employees who act as proxy customers for the purchase of the products and services in the experimental scenarios. The selection of employees as participants for the main study is justified on the basis that employees are customers when they purchase for their companies in a B2B purchase setting and these same employees are also customers when they purchase goods and services in a personal capacity in a B2C context. Thus, employee participants evaluate two experimental scenarios in multi co-creation experimental contexts. The data is collected in a field setting, in that the participants evaluate the experimental scenarios in their workplace or home. Table 5.5 summarises the sampling plan for the main study.

The choice of employees as the sampling frame means a convenience-purposive sampling approach to data collection (Teddlie & Yu, 2007) is adopted for the main study. The rationale for convenience sampling for the main study is that the pool of potential employees available to participate in the study was limited in terms of the number of organisations agreeing to participate in the study, and the researcher did not have control to randomly select employees for the study. Hence, the lack of random selection of participants meant that the researcher had to accept all appropriate employees identified by managers in each of the participating organisations as participants in the main study. Thus the lack of random selection of employees means that the sample is a convenient sample.

The purposive criterion used to select appropriate employees is that each employee selected to participate in the study had to be part of the buying centre in the organisation.

Thus, the researcher made a specific judgement that the employees' who were representative of the buying centre were appropriate participants to evaluate the role-playing scenarios for the main study. To ensure appropriate selection of employees representing the buying, each organisation was contacted by means of a letter from the researcher explaining the research and inviting the organisation to participate in the study. When an organisation agreed to participate, the researcher would meet with the manager and explain the study and outline the tasks required of the sample participants. The manager would then select appropriate staff satisfying the buying centre criteria to participate in the study. Hence, the procedure adopted in discussions with the manager in the participating organisation enabled the identification and choice of appropriate staff representing the buying centre in the participation organisations.

Confirmatory factor analysis and structural equation modelling are the primary techniques for analysing the data collected from the sample participants. Foster (2008) suggests 15-30 participants per dependent variable are required for CFA and structural equation modelling analysis. The dataset comprises of 563 completed survey questionnaires is more than adequate for the requirements of CFA and SEM analysis.

#### 5.4.1 Unit of analysis

The unit of analysis refers to the level of aggregation of the data collected in the data analysis stage (Sekaran, 2003). The unit of analysis for a study may consist of an individual, a group, an industry, countries, programmes, critical incidents, events, relationships (Sekaran, 2003). The problem statement for this study focuses on the individual customer's perspective of co-creation in the purchase situation. Therefore, the unit of analysis for this study is identified as the individual customer's perceptions of co-creation in the simulated purchase situation experienced in the experimental scenarios.

## 5.5 Experimental materials and procedures

### 5.5.1 Experimental materials

The four contexts for the main study require the development of four experimental scenarios as depicted in each of the cells in Figure 5.2. Each cell in Figure 5.2 shows the characteristics of one of the four experimental scenarios. A within-subjects research design means that each participant evaluates two experimental scenarios i.e. one experimental scenario in each of the contexts in Figure 5.2. The diagonal arrows in Figure 5.2 show the pairs of experimental scenarios that each participant evaluates.

Figure 5.2 Contexts of experimental scenarios

	B2B	B2C
PRODUCT	Cell 1 B2B-Product scenario	Cell 2 B2C-Product scenario
SERVICE	Cell 3 B2B-Service Scenario	Cell 4 B2C-Service Scenario

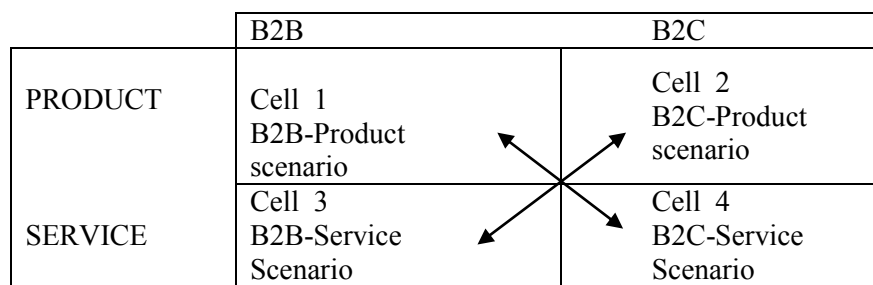


Table 5.6 shows the four possible combination pairs of experimental scenarios that participants complete in the data collection phase of the study. Table 5.6 also shows an inversion of the presentation order of the experimental scenarios for Combinations 2 and 4, as compared to the presentation order of the experimental scenarios in Combination 1 and 3. The inversion in the presentation order of the experimental scenarios is to counterbalance and mitigate any order bias in the data collection process (Field & Hole, 2003).

Table 5.6 Combination pairs of experimental scenarios

	Cell number	Scenario context
Combination 1	Cell 1 / Cell 4	b2b–product / b2c-service
Combination 2	Cell 4 / Cell 1	b2c-service / b2b-product
Combination 3	Cell 2/ Cell 3	b2c-product / b2b-service
Combination 4	Cell 3/ Cell 2	b2b service / b2c-product

Each experimental scenario in Figure 5.2 in turn contains three co-creation treatments (low, moderate and high). Therefore each combination pair of experimental scenarios in Table 5.6 is expanded into a 3 x 3 matrix = 9 (treatment pairs of scenarios) as shown in Table 5.7. Table 5.7 shows 9 scenario treatment pairs for Combination 1.

Table 5.7 Experimental scenario combinations1

B2B product				
Treatments		Low	Moderate	High
B2C Service	Low	Low B2B (P) Low B2C (S) Scenario Pair 1	Low B2B (P) Moderate B2C (S) Scenario Pair 2	Low B2B (P) High B2C (S) Scenario Pair 3
	Moderate	Moderate B2B (P) Low B2C (S) Scenario Pair 4	Moderate B2B (P) Moderate B2C (S) Scenario Pair 5	Moderate B2B (P) High B2C (s) Scenario Pair 6
	High	High B2B (P) Low B2C (S) Scenario Pair 7	High B2B (P) Moderate B2C (S) Scenario Pair 8	High B2B (P) High B2C (S) Scenario Pair 9

Note: (P) = product, (S) = service

The total numbers of treatments for the four combinations pairs of experimental scenarios equals 3 x 3 x 4=36 treatment pairs. A within-subjects experimental research design for the main study means that each participant evaluates 1 pair of treatments of the experimental scenarios from the 36 (3x3x4) treatment pairings of experimental scenario from combinations 1- 4 as shown below in Table 5.8 (a) – (d). Tables 5.8 (a) – (d) presents the full complement of 36 treatment pairings of the experimental scenarios.

Table 5.8 (a) Experimental scenario combinations 1

	B2B Product			
	Treatment	Low	Moderate	High
B2C Service	Low	Low B2B (P) Low B2C (S) Scenario Pair 1	Low B2B (P) Moderate B2C (S) Scenario Pair 2	Low B2B (P) High B2C (S) Scenario Pair 3
	Moderate	Moderate B2B (P) Low B2C (S) Scenario Pair 4	Moderate B2B (P) Moderate B2C (S) Scenario Pair 5	Moderate B2B (P) High B2C (s) Scenario Pair 6
	High	High B2B (P) Low B2C (S) Scenario Pair 7	High B2B (P) Moderate B2C (S) Scenario Pair 8	High B2B (P) High B2C (S) Scenario Pair 9

Note: (P) = product, (S) = service

Table 5.8 (b) Experimental scenario combinations 2

	B2C Service			
	Treatment	Low	Moderate	High
B2B Product	Low	Low B2C (S) Low B2B (P) Scenario Pair 1B	Moderate B2C (S) Low B2B (P) Scenario Pair 2B	High B2C (S) Low B2B (P) Scenario Pair 3B
	Moderate	Low B2C (S) Moderate B2B (P) Scenario Pair 4B	Moderate B2C (S) Moderate B2B (P) Scenario Pair 5B	High B2C (s) Moderate B2B (P) Scenario Pair 6B
	High	Low B2C (S) High B2B (P) Scenario Pair 7B	Moderate B2C (S) High B2B (P) Scenario Pair 8B	High B2C (S) High B2B (P) Scenario Pair 9B

Note: (P) = product, (S) = service

Table 5.8 (c) Scenario combination 3

	B2C Product			
	Treatment	<i>Low</i>	<i>Moderate</i>	<i>High</i>
B2B Service	Low	Low B2C (P) Low B2B (S) <i>Scenario Pair 10</i>	Low B2C (P) Moderate B2B (S) <i>Scenario Pair 11</i>	Low B2C (P) High B2B (S) <i>Scenario Pair 12</i>
	Moderate	Moderate B2C (P) Low B2B (S) <i>Scenario Pair 13</i>	Moderate B2C (P) Moderate B2B (S) <i>Scenario Pair 14</i>	Moderate B2C (P) High B2B (s) <i>Scenario Pair 15</i>
	High	High B2C (P) Low B2B (S) <i>Scenario Pair 16</i>	High B2C (P) Moderate B2B (S) <i>Scenario Pair 17</i>	High B2C (P) High B2B (S) <i>Scenario Pair 18</i>

Note: (P) = product, (S) = service

Table 5.8 (d) Experimental scenario combinations 4

	B2B Service			
	Treatment	Low	Moderate	High
B2C Product	Low	Low B2B (S) Low B2C (P) Scenario Pair 10B	Moderate B2B (S) Low B2C (P) Scenario Pair 11B	High B2B (S) Low B2C (P) Scenario Pair 12B
	Moderate	Low B2B (S) Moderate B2C (P) Scenario Pair 13B	Moderate B2B (S) Moderate B2C (P) Scenario Pair 14B	High B2B (s) Moderate B2C (P) Scenario Pair 15B
	High	Low B2B (S) High B2C (P) Scenario Pair 16B	Moderate B2B (S) High B2C (P) Scenario Pair 17B	High B2B (S) High B2C (P) Scenario Pair 18B

Note: (P) = product, (S) = service

Tables 5.9, 5.10 & 5.11 shows the B2C product scenarios provided to participants for one context in the main study. All other scenarios adopted in the main study are shown in Appendix 5.

Table 5.9A Main study - B2C high co-creation product scenario

Please read this short scenario and provide a response to the statements below. Thanks

Imagine you are shopping for a new desktop personal computer for use in your household. You are mindful that the new computer has to cater for needs of different members of your household. You go to Tech-Infinity Computers, a reputable computer supplier on the recommendation of a friend and talk to Cameron, a sales staff in the computer shop about your computer requirements. Cameron and you discuss your computer requirements. From the discussion, it becomes clear to you that a custom-built desktop computer would best suit your computing needs.

Cameron and you discuss the advantages and disadvantages of a custom-built computer. From the conversation it becomes evident to you that a custom-built computer offers value for money as well flexibility when your computing needs expands. So you decide on a custom-built desktop computer for your purchase.

Cameron briefs you on the steps in custom building a computer and provides you with a component parts catalogue for you to make your selections. When Cameron returns a few minutes later, you explain that you have made your selections; however you are unsure of a couple of items in your list of component parts. Cameron and you discuss your difficulties thoroughly and you finalise the list of components for your personal computer.

Cameron prices the computer at \$1,975.00. You agree on the price and Cameron indicates your computer will be assembled later in the day and you can pick your computer up the next morning. The next morning you return to the shop, pay for the computer and take it home.

A day later you receive an email message from Cameron thanking you for the business and assuring you that you should have no hesitation in contacting Cameron if there any issues with regards to your purchase. The email ends with a note that the company hopes that you will return for your future computer related purchases. The email also asks you whether you wish to be on the company email list for information on new products and promotions.



Table 5.9B Main study B2C moderate co-creation product scenario

Please read this short scenario and provide a response to the statements below. Thanks

Imagine you are shopping for a new desktop personal computer for use in your household. You are mindful that the new computer has to cater for needs of different members of your household. You go to Tech-Infinity Computers, a reputable computer supplier on the recommendation of a friend and talk to Cameron, a sales staff in the computer shop about your computer requirements. Cameron and you discuss your computer requirements. From the discussion, it becomes clear to you that a custom-built desktop computer would best suit your computing needs. So you decide on a custom-built desktop computer for your purchase.

Cameron takes out a component parts catalogue, marks off component parts for your custom-built computer, and gets you to look at the list and confirm the selections. Cameron leaves you for a few minutes while you are looking at the list of component parts for your computer. When Cameron returns you inform that you agree with most of the selections except you want a more powerful graphics card, a larger computer screen and a cordless keyboard.

Cameron prices the computer at \$1,975.00. You agree on the price and Cameron indicates your computer will be assembled later in the day and you can pick your computer up the next morning. The next morning you return to the shop, pay for the computer and take it home. A day later you receive an email from the company thanking you for the business. The email also asks you whether you wish to be on the company email list for information on new product and promotions.

Table 5.9C Main study2 B2C low co-creation product scenario

Please read this short scenario and provide a response to the statements below. Thanks

Imagine you are shopping for a new desktop personal computer for use in your household. You are mindful that the new computer has to cater for needs of different members of your household. You go to Tech-Infinity Computers, a reputable computer supplier on the recommendation of a friend and talk to Cameron, a sales staff in the computer shop about your computer requirements. Cameron and you discuss your computer requirements. From the discussion, it becomes clear to you that a custom-built desktop computer would best suit your computing needs. So you decide on a custom-built desktop computer for your purchase.

Cameron takes out a component parts catalogue and marks all the components making up your computer. Cameron prices the computer at \$1,975.00. You agree on the price and Cameron indicates your computer will be assembled later in the day and you can pick your computer the next morning.

The next morning you return to the shop, pay for the computer and take it home. A day later you receive a standard email addressed to all new customers of the computer company asking whether you wish to be on the email list for information on new products and promotions.

Each of the three levels of treatment varies the degree of the independent co-creation construct in each of the levels of the experimental scenarios. The three treatments in the experimental scenarios are categorised as low, moderate and high levels of co-creation. Each of the experimental scenarios describe the same purchasing situation for an identical airline booking and the purchase of a computer in either a B2B or B2C context, however each experimental scenario treatment contains one of the three treatment levels of co-creation. The experimental scenario treatments provide a disturbance to the model that better allows for measurement of variations in co-creation and in the dependent variables. The three levels of co-creation are merely a modelling contrivance and actual perceived levels of co-creation are measured for each participant during the research process.

#### 5.5.2 Experimental procedures

Each participant reads one of the experimental scenario treatments and places themselves in the context of the purchaser in the experimental scenario. After reading each of the scenarios the participant completes a survey questionnaire. The survey questionnaire consists of a series of statements on a seven-point Likert scale, to measure both perceptions of the independent and dependent variables in the research model.

#### 5.5.3 Manipulation checks

A manipulation check of the co-creation scale indicates that it is successful. A one-way analysis of variance (ANOVA) demonstrates that the levels of co-creation are significantly different across the high co-creation (mean = 5.80); moderate co-creation (mean = 5.37; low co-creation (mean = 5.22) experimental scenario treatment ( $F = 12.52, p > 0.001$ ).

#### 5.5.4 Sequence of scale items

The within-subjects research design adopted requires each participant to evaluate two experimental scenarios in two different contexts back-to-back in one sitting, and to complete a survey questionnaire for each of the experimental contexts. This approach to collecting data has the potential to generate bias from order and history effects, if the sequence orders of measurement scale items in the questionnaires are similar. To mitigate the potential for this potential bias, each questionnaire adopts a different order of sequence for the scale items (Field & Hole, 2003). Levene's test for homogeneity of variance shows the variance for all measurement scale items (except for CC2) are  $> 0.05$ , which indicates that the sequence of order of presentation of the scale items do not adversely affect the homogeneity of variances in the dataset (Field, 2005).

#### 5.6 Measurement scales

Churchill's (1979) suggested procedure for measurement scale development is adopted for developing the measurement scale items in the survey questionnaire. The measurement scales comprise of multi-item reflective indicators for the study constructs. The synthesised construct definitions enable the development of two new scales for the co-creation and relationship strength. The remaining dependent constructs of satisfaction, trust, attitudinal and behavioural loyalty adopt existing, validated, multi-item measurement scales. The construct definitions (see Table 5.12) provide an anchor to select appropriate measures for these dependent constructs.

To establish face and content validity for the measurement scales, two academic experts scrutinised the measurement scales and suggested improvements to the phrasing of the items. Appendix 6 shows the formatted version of the questionnaires provided to the participants. Prior to the full rollout of data collection, pre-testing of the

measurement instruments with 30 employees provided a further check to satisfy face and content validity for the measurement instruments.

Exploratory factor analysis of the dataset requires pruning a number of scale items that cross-load to other constructs. The remaining measurement items retained for confirmatory factor analysis show strong convergent and discriminant validity. The final retained measurement items also show strong evidence of internal consistency and reliability for scale items representing the respective constructs (Table 6.12).

Table 5.10 shows a summary of the steps in developing the multi-item measurement scales for the study.

Table 5.10 Procedure for developing measurement scales

Step 1 Specify domain	Construct definitions for study synthesised from literature (See Tables 5.12)
↓ Step 2 Generate sample items	↓ New scales development for co-creation construct (5 items) and relationship strength construct (9 items), existing scales for satisfaction (3 items), trust (3 items), attitudinal loyalty (4 items) and behavioural loyalty (4 items). All measurement items are reflective indicators for each construct (See Tables 5.14 A-D)
↓ Step 3 Expert opinion	↓ Experts check and verify that items are covering the content of constructs is consistent to definition of constructs. Experts recommend dropping CC4 (reverse phrasing), RS1, RS2 (not reflective of domain of construct). Experts suggest rewording AL2 from negative to positive phrasing
↓ Step 4 Questionnaire development	↓ Measurement scale items re-phrased to fit contexts of research and set out in a survey questionnaire format
↓ Step 5 Pre-tests	↓ Questionnaire and experiments pre-tested on 30 employees

↓ Step 6 Collect data	↓ Data collection; 290 participants yielding 563 completed questionnaires
↓ Step 7 Exploratory factor analysis	↓ RS3, RS4, RS5 & RS6 items from relationship strength construct dropped. AL2 from attitudinal loyalty construct and RI4 from behavioural loyalty construct dropped as these items cross-load on other construct in EFA analysis (See Chapter 6, Table 6.10)
↓ Step 8 Confirmatory factor analysis	↓ All items show strong convergent validity except for CC1. CC1 trimmed from further CFA analysis (See Chapter 6, Table 6.14)
↓ Step 9 Items retained after Confirmatory factor analysis	↓ All remaining items present convergent validity
↓ Step 10 Reliability analysis- Internal consistency of measurement items for constructs	↓ Reliability analysis result show measurement item reflect high internal consistency in measuring each of the constructs (See Chapter 6, Table 6.12)
↓ Step 11 Construct Validity	↓ Strong evidence of convergent validity for items reported in CFA analysis – (See Chapter 6, Table 6.17 Strong evidence of discriminant validity for constructs reported in Table 6.18

### 5.6.1 Multi-items measurement scales

The rationale for multi-item measures in this study is that the constructs in the research model are latent constructs and there are no manifest scales that directly capture them. In the absence of direct measures, indirect indicators provide the means to capture the underlying meaning of the latent construct. Multiple indicator items indirectly reflect the underlying meaning of the constructs (Bollen, 1984; Schumacker & Lomax,

2004). The operational definitions for co-creation and relationship strength suggest that these constructs are multi-faceted, hence the application of multi-item measurement scales for both. The validated measurement scales selected for the dependent constructs for satisfaction, trust, attitudinal and behavioural loyalty scales all comprise of multi-item measurement scales. Additionally, CFA and SEM analytical techniques require multi-item measurement scales for analysis of the dataset (Byrne, 2001).

Multi-item measurement scales are classified as reflective or formative (Baxter, 2009). The diagrams below, in Figure 5.3, present the key differences between reflective and formative measurement scales. The key visual difference between these two measurement approaches is whether the arrowhead from the indicators items point to or away from the latent variable, depending on the specified causal direction.

The indicator items are reflective scale measures if the arrowheads point away from the latent variable as in Figure 5.3 (left panel) and the indicator items are considered formative measures if the arrowheads point to the latent variable as in Figure 5.3 (right panel) (Baxter, 2009; Bollen, 1984; Diamantopoulos, Riefler, & Roth, 2008; Jarvis, Mackenzie, & Podsakoff, 2003).

Figure 5.3 Reflective and formative measurement indicators

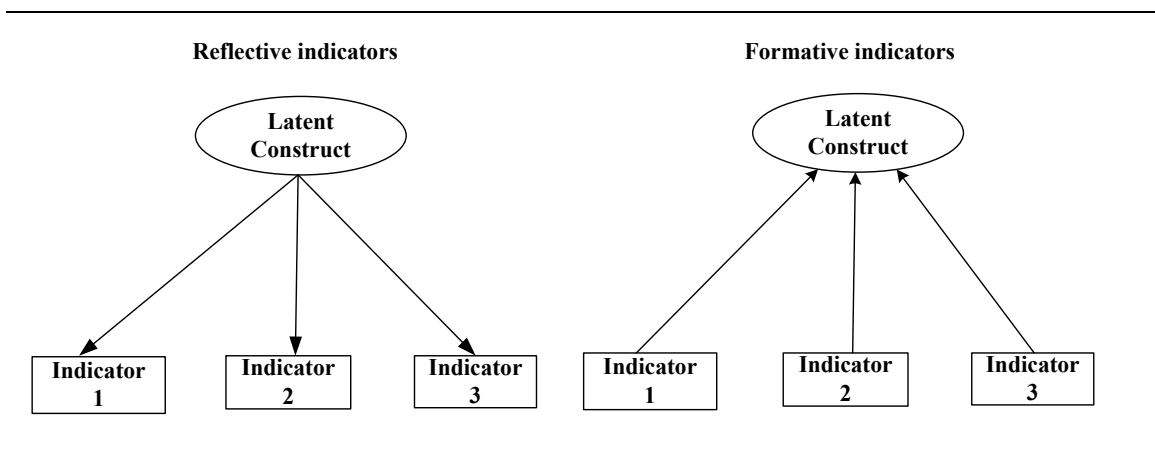


Table 5.11 presents the key theoretical differences between reflective and formative measurement scales (Baxter, 2009; Diamantopoulos et al., 2008; Jarvis et al., 2003; Söderlund, 2006).

Table 5.11 Characteristics of reflective and formative measurement indicators

Reflective measurement model	Formative measurement model
Multi-items scale	Multi-items scale
Multi-items are indicators of an underlying construct. Each measurement item depicts, describes and portrays some relevant facet of a construct.	Measurement items generate causal changes to construct. Therefore measurement items are antecedents of the underlying construct
No requirement for exhaustive identification for of all indicator items for construct.	Requirement to exhaustively identify all dimensions of a construct. Each dimension may require multi-items measures to measure each dimension of the construct
Therefore purifying and dropping measurement items from a pool of measurement items does not reduce validity of a construct	Dropping and purifying dimensions reduces the measurement validity of a construct
Unidimensionality is a requirement for reflective models. Unidimensionality evidence in the form of internal consistency (Cronbach $\alpha$ ), convergent and discriminant validity	No requirement for unidimensionality in formative measurement models

The contention in this study is that multi-item scales representing each of the constructs in the research model are reflective indicators. The evidence to support this perspective is first, that the existing measurement scales for satisfaction, trust, attitudinal and behavioural loyalty constructs are operationalised as reflective indicators in the literature (Morgan & Hunt, 1994; Pritchard et al., 1999; Ranaweera & Prabhu, 2003; Swanson & Kelley, 2001). Second, the two new constructs of co-creation and

relationship strength are conceptualised and developed by identifying relevant attributes, traits and facets for each of the constructs. The indicator items for both these constructs capture some relevant aspects of the latent constructs. Hence, the indicator items for both these constructs represent attributes, facets or traits of the underlying constructs. This strongly suggests that reflective measurement scales are appropriate.

The data analysis phase of the study provides supporting evidence that measurement scales for this study fit into the category of reflective measurement scales, too. The purification and deletion of some scale items in the exploratory and confirmatory analysis phases of the research does not reduce construct validity for the constructs in the study. This evidence is consistent with the theory that construct validity for reflective indicator variables is not adversely affected by removal of one or more of the indicators items in the measurement scale for a specific construct. Additionally, the theory on reflective indicators states that appropriate selection of multi-items scale reflective scales demonstrate strong evidence of internal consistency. The statistical evidence of internal consistency for every construct in this study shows high degree of co-variation among the scale items for each. Internal consistency results are consistent with conclusion that the scale items for the constructs in the current study represent reflective measurement scales. Overall, the theoretical and empirical evidence strongly supports the adoption of multi-item reflective measurement for the model's constructs.



### 5.6.2 Construct definitions

The construct definitions developed from a synthesis of the literature presented in Chapter 2 is presented here again in a consolidated table.

Table 5.12 Construct definitions

Constructs	Operational definitions of constructs
Co-creation	Co-creation is defined as the active participation, interactions, dialogue and collaboration of the buyer and seller and other actors in the in the marketing exchange to develop a deeper understanding of the customer problem solving context. The joint problem solving generates a customer solution or a reconfigured customer solution. The value of the co-created solution is drawn from the perceptions of the buyer (Ballantyne & Varey, 2008; Lundkvist & Yaklef, 2004; Rajah et al., 2008)
Relationship strength	<p>Relationship strength is defined in this study as the extent of close bonds between the buyer and seller arising from interactions in the marketing exchange (Ahmad &amp; Buttle, 2001; Barnes, 1997; Granovetter, 1973)</p> <p>This definition is a bounded view of relationship strength in that it focuses purely on the perceived degree of attachment, tie, connection or glue existing between the buyer and seller.</p> <p>If the attachment between the buyer and seller is perceived as close, then relationship strength is deemed strong and conversely relationship strength is considered weak if the attachment between the buyer and seller are distant.</p>
Trust	The conceptual definition of trust is based on Morgan & Hunt's definition of the trust construct i.e. trust exists when one party has confidence in a partner's reliability and integrity (Garbarino & Johnson, 1999; Morgan & Hunt, 1994; Ranaweera & Prabhu, 2003)
Satisfaction	Customer satisfaction in this study is conceptualised as an overall post-purchase evaluation of the final customer solution. (Giese & Cote, 2000; Oliver, 1993; Ranaweera & Prabhu, 2003)
Attitudinal loyalty	Attitudinal loyalty in this study is conceptualised as the customer's perception of the degree of favourable mental or psychological disposition towards the seller (Bandyopadhyay & Martell, 2007; Bloemer, De Ruyter, & Wetzels, 1999; Butcher et al., 2001; DeWitt et al., 2008; Evanschitzky et al., 2006; Odin et al., 2001; Pritchard et al., 1999; Söderlund, 2006)
Behavioural loyalty	Re-purchase intention measures the strength of the customer's propensity to purchase from the selling company (Mittal & Kamakura, 2001; Swanson & Kelley, 2001)

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Repurchase intentions is adopted as a proxy for measuring behavioural loyalty in the experiment scenarios as the participants in the study are indicating future purchase intentions from the simulated purchase scenario experienced in the experimental scenario treatments

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Table 5.13 presents an analysis of relevant literature that helps synthesise an operational definition of the co-creation construct. The third column in Table 5.13 shows attributes and strands relating to co-creation. Specifically, the analysis shows co-creation requires a number of actors, collaborations or interactions between these actors, that the customer is active in the interactions (Grönroos, 2008; Kotze & du Plessis, 2003; Vargo & Lusch, 2004a), and that the co-creation engenders a buyer solution comprising of tangible and intangible value (Mascarenhas et al., 2004). Furthermore, value from co-creation is evaluated from the perceptions of the buyer (Cova, 1997; Grönroos, 2008; Vargo & Lusch, 2004a), both parties are required for the generation of a co-created solution (Grönroos, 2008), each party on its own is not able to come with the solution and that the joint collaboration yields the co-created solution (Lundkvist & Yaklef, 2004). These attributes for the co-creation domain are distilled into the measurement scale items for the co-creation construct as shown in Table 5.14A

Table 5.13 Synthesising operational definition of co-creation

References	Extract of statements defining the meaning and dimensions of the co-creation construct.	Keyword, phrases to reflecting meaning of co-creation
(Wikstrom, 1996a, 1996b)	“Co-production is buyer seller social interaction and adaptability with a view to attaining further value.”	Buyer seller social interaction Attaining value
(Rice, 2005)	“An open ongoing collaboration between employees and customers to define and create products, services, experiences, ideas and information.”	Open ongoing collaboration between 2 or more parties to define and create

	Co-creation is the process for distributed value creation between firms and customers or between customers directly to create personalised value	products process interactions between actors to create personalised value
(Kotze & du Plessis, 2003)	Co-production is the active participation of the customer in the delivery of the service encounter and at the same time contributing to their own satisfaction, quality and value perceptions	Active participation of customer Contributing to own satisfaction and value perceptions
(Ballantyne & Varey, 2007)	Co-creation is active customer engagement and involvement in the creation of value	Active customer engagement and involvement in value-creation set within a relationship
(Gronroos, 1994)	Value for customers is created throughout the relationship by the customer, partly in interactions between customers and the supplier or service provider. The focus is not on products but on customer value creating processes where value emerges for customers and is perceived by them	Interactions between buyer and seller generates value as perceived by customers
(Ottensen et al., 2005)	Value co-production is value co-produced by 2 or more actors, with and for each other, with and yet other actors.” Value is not simply added, it is mutually created and re-created among actors with different values	Value created by actors Value mutually created and recreated among actors

(Ballantyne & Varey, 2007)	Customer is always involved in the creation of production of value.....marketing is a continuous process where production and consumption is part of the same value creating process	Customer part of value creating process
(Ramirez, 1999)	Production is creation, consumption is not destruction of value but creation of value	Consumption is part of value creation
(Bitner, 1995)	Customer participation can be viewed as the extent to which customers participate in the provision of a service and the roles customers adopt in a service encounter	Roles customer adopt in service encounter
(Prahalad & Bettis, 2000)	Enabling consumers to shape and create a personalised consumption experience.... Personalisation is about the customer becoming a co-creator of the content of their experience. Personalised meaning of the product as a result of the consumption of the product / service and interactions within the experience network.	Customers involved in the creation and shaping of value via interactions within experience network
(Cova, 1997)	It is not the producer who decrees that their product has a linking value, it is people who going to use it who will give this meaning. Moreover the meanings of objects are no longer fixed and connected with their functions, but free floating each individual may ascribe different meanings to their objects	Linking value
(Cova, 1997)	makes the hypothesis that in a more and more atomised individualistic society, the lack of community has to be compensated by the consumption of signs and symbols which reassure the individuals of their identity and	Self identity creation Self expression

	<p>give meaning to their life, while giving them the illusion of belonging to a virtual community of customers (Belk + Bryce, 93, p293) Thus the marketing system plays a primordial role in the construction of the identity of the post-modern individual</p>	
(Ritson & Elliott, 1995)	<p>Individuals who actively involved in the marketing communications process can derive their own personalised meanings of the communications experience. The consequence of individuals interpreting an experience in a “polysemy” of interpretations is that every individual is capable of co-creating their own subjective consumption experience</p>	<p>Derive personalised meanings</p>
(Lundkvist & Yaklef, 2004)	<p>Conversation is a process during which new ideas and knowledge is jointly created by the parties involved in the exchange; conversation is the source of active participation and mutual commitment between the interactants and finally, attempts to (seriously) involve customers through conversations will transform customers into organisational change agents.</p> <p>with regard to customer involvement in firms’ value creation, researchers have identified five roles that these can play: customers as “resources”, “co-producers”, “buyers”, “users” and “products</p> <p>.. the use of language in general, conversation and dialogue in particular as a medium of knowledge</p>	<p>Interactions via conversations sharing ideas, transferring meanings results in new forms of reconfigured ideas and meanings</p> <p>Interactions via conversations lead to collective action</p>

	co-creation and transfer has been emphasised by a number of theorists	
	<p>.....it is not the speaker who acts and the listener who responds; the act of communication is in of itself a joint production, collaboratively arrived at” “neither the firm nor the customers separately would have figured out the idea of developing the “... solution</p>	Problem solving solution may not have been figured out by a single actor. Both actors are required for the new solution to be generated
(Mascarenhas et al., 2004)	<p>the concept of CVCI implies that the target customers should be exposed to its persons, processes, products and brands and to the networking relationships. This exposition is not passive like the spectator audience of a trade show but rather it is an active interaction and participation with all the players and elements of the value chain as long as this involvement adds value to its customers and to its producers. The added value to the customer is the more than a new product that is useful, convenient and state of the art, it is the competitive experience of co-creating the product with the company (Prahalad and Ramaswamy 2003), the experience of co-producing and co-owning it (Lengnick-Hall, 1996), the experience of purchasing and repurchasing it and by supporting the firm with positive referrals of its products and services (Schneider and Bowden, 1999). The added value to the producers are the insights from customer interaction and participation, continuous feedback, co-creation and co-ownership of products, customer satisfaction, retention, customer delight, the loyalty that comes from such interaction and the positive referrals that result from and delighted</p>	<p>Active involvement of all actor</p> <p>Active interactions and participation with actors in the value chain to co-create product with company</p> <p>Added value to producer is the insights from customer interactions and participation</p>

customers	
<p>The current problem with CRM is that it assumes that a company knows how to create value for customers. This old world top down approach does not work anymore. Customers do not always identify with the experience fabricated by companies. They want to shape those experiences themselves, both individually or with other customers from brand communities (Prahalad and Ramaswamy, 2000). They want experiences that build upon their wired, networked, informed and active lives (Prahalad and Ramaswamy, 2003)</p>	<p>Problem with CRM is that it assumes that a company knows how to create value for customers</p> <p>Customers now want to be involved in shaping value</p>
<p>You have to engage customers as co-equal problem solvers, so that they can create value that is unique to them. A CVCI driven CRM does not view customers as targets to be had, but as single persons to be treated with personalised, unique and need satisfying experiences (Prahalad and Ramaswamy, 2003)</p>	<p>Engage customer as co-equal problem solvers to create unique customer value</p> <p>Engage customer to act as co-equal problem solvers to create value</p>
<p>The companies that cooperate with customers to deliver CVCI based unique experience products and services will enjoy sustainable competitive advantage. It is in the context of delivering producer-customer co-created satisfaction experiences that we propose the CVCI model. The greater the customer involvement, the greater the potential for co-creating lasting satisfying experiences for the customer.”</p> <p>.....Instead we involve most customers to help them determine their own space, their value, their</p>	<p>Cooperate with customers to create unique value for sustainable advantage</p> <p>The greater the customer involvement the higher the potential for lasting satisfying experiences for the customer</p> <p>Involve customers to create unique value</p>

experience and them co-create a  
product or service that will foster and  
forge that unique experience for that  
customer....

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### 5.6.3 Listing of measurement scale items for constructs

As discussed earlier, the co-creation and relationship strength constructs are new measurement scales. Table 5.14A and 5.14B present the measurement scale items for each of these constructs. Tables 5.14C and 5.14D present the selection of appropriate validated scale items for the satisfaction, trust, attitudinal and behavioural loyalty constructs.



Table 5.14A Scale items for the co-creation construct

Construct	Definition of construct for study	Scale items for construct	Code	Source(s) for scale items
Co-creation Key strands of the domain of co-creation is extracted from the analysis of the literature in Table 5.13	Co-creation is defined as the active participation, interactions, dialogue and collaboration of the buyer and seller and other actors in the in the marketing exchange to develop a deeper understanding of the customer problem solving context.	The (travel agency)* went out of its way to work with me	CC1	New scale developed for study(Rajah et al., 2008)
		I contributed actively to my final customer solution	CC2	
	The joint problem solving generates a customer solution or a reconfigured customer solution. The value of the co-created solution is drawn from the perceptions of the buyer (Ballantyne & Varey, 2008; Lundkvist & Yacklef, 2004; Rajah et al., 2008)	My final marketing solution was arrived through the joint efforts of the (travel agency) and me	CC3	
		It did not matter whether the customer participated in the marketing transaction, the company would have been able to deliver the same final solution (R)	CC4	
		My final customer solution evolved from the active participation of the (travel agency) and me	CC5	
		Overall, I would describe my final customer solution as a high level of co-creation	CC6	

\*Note the term travel agency in these tables’ is substituted for computer company as in the second questionnaire

Table 5.14B Scale items for the relationship strength construct

Construct	Definition of construct for study	Items	Code	Source(s) for scale items
Relationship strength	Relationship strength is defined in this study as the extent of close bonds between the buyer and seller arising from interactions in the marketing exchange.	I got a good price deal from the (travel agency)	RS1	New scale developed for this study (Rajah et al., 2008)
		The (travel agency) has good pricing for its product offerings	RS2	
		I like my interactions I have with the (travel agency)	RS3	
	This definition is a bounded view of relationship strength in that it focuses purely on the perceived degree of attachment, tie, connection or glue existing between the buyer and seller as a consequence of the marketing exchange.	The travel agency makes a strong effort to get to know me	RS4	
		The (travel agency) is flexible and adaptable in its marketing approach to the customer	RS5	
		I am willing to share to share information and knowledge with the (travel agency)	RS6	
	If the attachment between the buyer and seller are perceived as close, then relationship strength is deemed strong and conversely relationship strength is considered weak if the attachment between the buyer and seller are distant. (Barnes, 1997; Granovetter, 1973; Rajah	My relationship to this specific (travel agency) is strong	RS7	
		My relationship to this specific travel (agency) is important to me	RS8	
		My relationship to this specific travel (agency) is something I care about	RS9	

Table 5.14C Scale items for trust & satisfaction constructs

Constructs	Definition of construct for study	Items	Code	Source(s) for Scale items
Trust	The conceptual definition of trust is based on Morgan & Hunt's definition of the trust construct i.e. trust exists when one party has confidence in a partner's reliability and integrity (Garbarino & Johnson, 1999; Morgan & Hunt, 1994; Ranaweera & Prabhu, 2003)	In our relationship, the travel agency can be counted to do what is right	T1	(Ranaweera & Prabhu, 2003) This is a parsimonious version of Morgan & Hunt's (1994) trust scale
		In our relationship, the travel agent has high integrity	T2	
		In our relationship, the travel agent can be trusted at all times	T3	
Satisfaction	Customer satisfaction in this study is defined as an overall post-purchase evaluation of the final customer solution. (Giese & Cote, 2000; Oliver, 1993; Ranaweera & Prabhu, 2003)	I think I did the right thing when I chose this travel agency	S1	(Ranaweera & Prabhu, 2003)
		The service offerings of this travel agency meet my expectations	S2	
		Overall, I am pleased with the services offerings of this travel agency	S3	

Table 5.14D Scale items for attitudinal and behavioral loyalty constructs

Constructs	Definition of construct for study	Items	Source(s) for Scale items
Attitudinal loyalty	Attitudinal loyalty in this study is conceptualised as the customer's perception of the degree of favourable mental or psychological disposition towards the seller (Bandyopadhyay & Martell, 2007; Evanschitzky et al., 2006; Odin et al., 2001; Söderlund, 2006) (DeWitt et al., 2008)	I consider myself to be a loyal patron of this travel agency	AL1
		If I had to do it all over again, I would do business with this travel agency	AL2
		I use this travel agency because it is the best choice for me	AL3
		This travel agency is distinct from other travel agencies	AL4
		To me XYX is the same as other travel agencies (R)	AL4

Behavioural loyalty  Re-purchase intention is adopted as a proxy for behavioural loyalty	Re-purchase intention measures the strength of the customer's propensity to purchase from the selling company (Mittal & Kamakura, 2001; Swanson & Kelley, 2001)	If I had a choice, I would use this travel agency again	BL_1	(Swanson & Kelley, 2001)
		I am likely to go back to this travel agency the next time I need airline tickets or travel related services	BL_2	
		I am likely to repurchase from this travel agency in the future	BL_3	
		I am not likely to switch to another travel agency	BL_4	

## 5.7 Reliability

Reliability refers to consistent and error-free measurements of the constructs in an empirical study (Hair et al., 2006; Zikmund, 2003). The design of the measurement instruments and statistical analysis of the dataset presents evidence of reliability for the study. Table 5.15 summarises the procedures adopted to satisfy reliability requirements for the constructs.

Table 5.15 Procedures to establish reliability

Measurement Instruments	Supporting evidence
Experimental scenarios	Operational definition of independent co-creation construct
	Qualitative pre-tests by experts to check and verify for consistency in the manipulation of the independent co-creation construct in the high, moderate and low treatment levels in the experimental scenarios
	Qualitative pre-tests by experts to check and verify for consistency in the manipulation of the independent co-creation construct across the different business contexts in the experimental scenarios
	Statistical support for manipulation check of experimental scenarios
	Statistical support for counterbalancing presentation order of experimental scenarios to participants
Measurement scales	Evidence of internal consistency of measurement scales assessed by Cronbach $\alpha$ scores and composite reliability methods

### 5.7.1 Reliability for experimental scenarios

In the design phase of the study, the operational definition of the independent co-creation construct provides an anchor to consistently manipulate the independent co-creation construct in each of the treatment levels of the experimental scenarios and across the different business contexts of co-creation for this study. Qualitative pre-testing and verification from expert academics provides support for the consistent manipulation of the independent construct in the experimental scenarios. In addition, statistical manipulation checks provide further evidence of reliability in the study. Finally, counterbalancing the order of the experimental scenarios is a further measure that supports reliability for data collection in the research.

### 5.7.2 Reliability in measurement scale items

The Cronbach alpha and composite reliability methods to assessing internal consistency for the measurement scale items shows strong evidence of internal consistency for all constructs in this study (statistical support for reliability reported in Chapter 6, Table 6.12).

## 5.8 Validity

Validity in a research study means measuring constructs accurately and precisely (Hair et al., 2006; Zikmund, 2006). Table 5.16 presents a summary of the procedures to establish construct validity in the research.

Table 5.16 Procedures to establish construct validity

Construct validity	Supporting Evidence	Location of source of supporting evidence
Statistical Inference validity	Large sample of 290 participants yielding 563 survey responses	Section 5.8.1
	Profile of sample reflects good degree of diversity in sample	Section 5.8.1
Internal validity in survey questionnaire	Operational definition of constructs to generate pool of measurement scale items	Table 5.12
	Experts' scrutiny and feedback on measurement scale items to support face (content validity) for measurement scale items	Section 5.8.2
	Qualitative feedback from pre-test of questionnaire on pool of 30 employees provides face and content validity for measurement scale items	Section 5.8.2
	Convergent validity for measurement scale items	Table 6.17
	Discriminant validity for measurement scale items	Table 6.18



Internal validity in experimental scenarios	Experts' scrutiny of experimental scenarios to assess appropriate variation and discrimination of independent co-creation variable in treatment level in the experimental scenarios. This scrutiny shows the process to satisfy face (content) validity for the experiments	Section 5.8.3
	Experts' scrutiny of experimental scenarios to assess the multi-business contexts of the experimental scenarios treats the independent co-creation variable consistently across business contexts. This assessment supports face validity for the experimental treatment across the business contexts	Section 5.8.3
	Pre-test on pool of 30 employees provides face and content validity for experimental scenarios	Section 5.8.3
	Manipulation check to assess if participants assessment of level of treatment in the experimental scenarios. The manipulation checks support internal validity	Section 5.8.3
External validity in experimental scenarios	Qualitative scrutiny by two industry experts and two academic experts to assess if the experimental scenarios are realistic purchases	Section 5.8.4
	Pre-test on 30 employees for feedback on realism of the purchase situation in the experimental scenarios	Section 5.8.4

#### 5.8.1 Statistical inference validity

A large sample size of 290 participants yielding 563 valid responses is the first of several procedures adopted to meet statistical validity. As this a within-subjects research design, this means that each participant completes two survey questionnaires. The large sample size means that any pre-treatment confounding influences are largely counteracted. In addition to the large sample size, the profile of the sample reflects a

good range of diversity in that it captures employees in every sector in the New Zealand Standard Industrial Classification (NZSIC). The large sample size and the diversity of the sample satisfy statistical inference validity requirements (Lynn & Lynn, 2003).

#### 5.8.2 Internal validity in survey questionnaire

Support for internal validity for the measurement scale items in the survey questionnaire is first satisfied by the scrutiny of the survey questionnaire by academic experts in the design phase of the study and, second, through statistical support from analysis of the dataset.

##### *Pre-testing survey questionnaire (measurement scales)*

Two academic experts scrutinised the measurement scale items to assess whether the scale items capture face and content validity for the constructs they purport to measure. The operational definitions of the constructs set out the domain for eliciting and selecting appropriate scale items for each of the constructs in the research model (Hair, Bush, & Oritinau, 2003).

The experts' evaluation suggested deleting measurement scale items RS1 & RS2 (representing relationship strength construct) from the initial pool of measurement items for the relationship strength construct as these two items do not reflect face validity for the construct. The experts also suggested dropping the negatively worded item CC4 (representing the co-creation construct) from the pool of co-creation measurement scales items, since there is evidence to show that negatively phrased measurement scale items creates confusion for participants when evaluating survey questionnaires (Benson & Hocevar, 1985; Schriesheim & Eisenbach, 1995). The experts further suggested re-phrasing measurement scale items AL2 & AL4 (representing attitudinal loyalty) from negative to positive phrasing, and re-phrasing item BL4 (representing behavioural

loyalty) from a question to a statement for consistency in the flow of the phrasing of the measurement scale items in the survey questionnaire. Expert opinion also suggested removing emphasis words such as ‘really’, and ‘mainly’ for the CC1 and CC3 (co-creation construct) to avoid leading statements (Usrey & Dooley, 1998).

Since this is a within-subjects study, each participant had to complete two questionnaires in one sitting, one for each of the co-creation contexts of the study. To mitigate history and memory effects each questionnaire adopts a different ordered sequence for the measurement scale items in each questionnaire. Statistical analysis of the dataset shows that the homogeneity of variance for these two sets of questionnaires are not significant, suggesting the sequence of scale items does not create bias in the dataset.

Prior to the full rollout to collect data, a pre-test of the measurement instrument (survey questionnaires) on a pool of 30 employees indicated that the instructions to participants for completing the survey were clear, the participants did not experience ambiguity in the phrasing of the measurement scale items and the participants were able to complete both sets of the questionnaires without experiencing any fatigue. Thus expert opinions and pre-testing with employees provide qualitative evidence to support both internal validity and face validity for the measurement scale items in the survey questionnaire. Appendix 6 shows the final formatted survey questionnaires containing the final list of measurement scale items, phrased to reflect the contexts of the experiments for the study.

#### *Post-data collection checks for internal validity*

The analysis of the dataset regarding the measurement scale items for each of the constructs presents strong evidence of convergent and discriminant validity.

Convergent validity is established when all the measurement items related to a specific

construct correlates strongly onto the hypothesised construct (Byrne, 2001; Hair et al., 2006; Tabachnick & Fidell, 2007). Convergent validity is assessed in the confirmatory factor analysis outputs by examination of the t-value (z-scores) for the unstandardised co-efficient loadings for each measurement scale item to ensure they do exceed  $\pm 1.96$  thresholds. Discriminant validity occurs when the measurement items for each specific construct in a research study correlates strongly with the relevant hypothesised construct and does not correlate strongly with other constructs in the research model. In other words, each measurement scale representing each construct is mutually exclusive to measuring the focal construct it is designed to measure (Fornell & Larcker, 1981; Hair et al., 2006; Tabachnick & Fidell, 2007). Chapter 6 reports on the statistical support for convergent and discriminant validity.

### 5.8.3 Internal validity in experimental scenarios

The key issue for internal validity in the design of the experimental scenarios for this study are first, consistency in the manipulation of the independent co-creation construct across the four experimental business contexts and, second, ensuring sufficient variation of the degree of co-creation (independent construct) in each of the treatment levels in the experimental scenarios. The levels of variations of co-creation provide the basis to assess its effects on the dependent variables in the research model.

#### *Pre-testing of the experimental scenarios*

Two academic experts scrutinised the consistency of the manipulation of the independent variable, co-creation, to check for a sufficient degree of variation in the treatment levels in the experimental scenarios, and to assess if there was consistency in the manipulation of the co-creation construct across the experimental business contexts. The experts' qualitative evaluation of the experiments presents support for both

consistency in manipulation in each of the treatment levels, and across the business contexts of the experiments.

Internal validity in the experimental scenarios is satisfied when the participants' responses arise solely from their perceptions of co-creation in the experimental scenarios. Therefore, it is critical that the experiments manipulate the independent variable only, and all other variables in the experimental scenarios are held constant. To ensure constancy of all other variables, the experiments avoid existing brand names of products and services. The deliberate omission of real brand names eliminates brand bias of the participants in the evaluation and responses of the participants (De Ruyter, Wetzels, & Kleijnen, 2001; Wirtz & Chew, 2002). Additionally, all names of people in the experimental scenarios are designed to be gender neutral to eliminate a possible gender bias of participants (Wirtz & Chew, 2002; Wirtz, Mattila, & Tan, 2000).

A pre-test of the experimental scenarios on 30 employees show that the experimental scenarios are clear, unambiguous and participants were able to understand the scenarios and respond with their perceptions without any difficulty. The qualitative pre-test carried out by the academic experts' and the pre-testing of the measurement instruments on the pool of 30 employees provide support for both internal and face (content) validity.

#### 5.8.4 External validity - experimental scenarios

External validity in the experimental scenarios is the assessment of the extent to which the experiments satisfy the 'realism' criteria for leading to a greater degree of generalisability (Lynn & Lynn, 2003; Weber, 1992). A qualitative scrutiny of the experimental scenarios by two industry experts and two academic experts evaluated the experiments' realism. Additionally, the 30 employees who formed the pre-test sample group were solicited for their views on whether the purchases represented in the

experimental scenarios are realistic. The qualitative pre-tests by the experts and participant employees provide support for realism in the external validity for the experimental scenarios, thus providing qualitative evidence of face validity. Finally, the statistical analysis of the multiple-contexts of the experiments, described later, adds additional evidence to support external validity of the study.

## 5.9 Analytical methods

There are multiple independent causal relationships between the independent co-creation construct and marketing outcome constructs. In this circumstance, Hair et. al., (2006) suggest that structural equation modelling (SEM) is an appropriate analytical technique. The key advantages of the SEM analytical method are that it is able to simultaneously estimate regression equations in multiple independent-dependent relationships, account for measurement error and facilitate the indirect measurement of latent constructs represented in the conceptual research model. (Byrne, 2001; Schumacker & Lomax, 2004).

Anderson & Gerbing (1988), *inter alia*, recommend a two-step procedure for the application of the SEM analytical tool. Step 1 requires the estimation of a measurement model through confirmatory factor analysis. This step establishes statistical support to show evidence of reliability and validity of the measurement scales. Establishing good empirical support for the measurement model allows the researcher to empirically estimate the structural model.

The multiple-business contexts in the main study are analysed through the multi-group invariance analysis procedure within the structural equation modelling procedure. The advantage of using the multi-group invariance analysis procedure is that the simultaneous analysis of the dataset, when comparing the different business contexts,

accounts for measurement error. This study uses the AMOS 17.0 structural equation modelling software.

#### 5.10 Ethics

This study was granted ethics approval on 31-10-2010 (reference number for ethics application number 10/11). A copy of the ethics approval letter is attached in Appendix 7.

#### 5.11 Chapter conclusion

This chapter details the specific research design issues for the main study. Chapter Six presents the analysis and findings from the analysis of the data collected for the study.

## CHAPTER 6: MAIN STUDY DATA ANALYSIS

Table 6.1 Chapter 6 outline

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6.1 Introduction
↓
6.2 Descriptive analysis
↓
6.3 Preliminary data screening
↓
6.4 Preliminary multivariate analysis
↓
6.5 Measurement model
↓
6.6 Structural model
↓
6.7 Multi-group invariance analysis
↓
6.8 Linking findings to research hypotheses
↓
6.9 Chapter conclusion

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### 6.1 Introduction

This chapter reports on the analysis and findings for the main study. The analysis is undertaken over three stages, starting with a descriptive profile of participants and assessing whether the data conforms to basic assumptions for multivariate analysis. Second, preliminary multivariate analysis by means of exploratory factor analysis and assessment of the reliability of scales for constructs. The final stage of the analysis involves the generation of the measurement model, structural model and conducting multi-group invariance analysis to compare the effects of co-creation for the multiple



business contexts. Lastly, the findings are compared to the research hypotheses to assess which of them are satisfied.

## 6.2 Descriptive analysis

### 6.2.1 Data collection

The research design requires each participant to read an experimental scenario and respond to statements in a survey instrument. A within-subjects experimental research design means that each participant evaluated two experimental scenarios and completed two survey questionnaires.

### 6.2.2 Response rate

350 copies of the research instrument, containing scenarios and surveys were sent to participants in Auckland, New Zealand, over a three-month period between May – July 2010. Of the 350 sent out, 290 surveys documents were completed and returned to form the dataset for this study. The 290 survey questionnaires for the study represent an 82% response rate for the data collection exercise. A within-subjects research design for the main study means that each participant completes two survey documents. Of the 580 survey questionnaires, 17 were incomplete and therefore were not included into the dataset, leaving a total of 563 complete survey responses for the main study. The preliminary contact with the manager in the participating organisation, personalised approach, follow-up visits and provision of self-addressed envelopes netted a high response rate (82%) for the sample in the main study

### 6.2.3 Profile of participants

Tables 6.2 to 6.7 show the descriptive statistics making up the profile of the participants in the sample population for the dataset.

Table 6.2 Gender of participants

Gender	Frequency	Percent
Male	152	52.4
Female	135	46.6
Total	287	99.0
Missing data	3	1.0
Total	290	100.0

Table 6.3 Age groups of participants

Age category	Frequency	Percent
20-30 years	150	51.7
31-40 years	57	19.7
41-50 years	56	19.3
51-60 years	14	4.8
61 and over years	10	3.4
Total	287	99.0
Missing data	3	1.0
Total	290	100%

Table 6.4 Management levels of participants

Management level	Frequency	Percent
Front Line	166	57.2
Middle Management	97	33.4
Senior Management	24	8.3
Total	287	99.0
Missing data	3	1.0
Total	290	100.0

Table 6.5: Number of years of work experience of participants

Years of work experience	Frequency	Percent
0-1 years	18	<b>6.2</b>
1-2 years	31	10.7
3-5 years	73	25.2
6-9 years	41	14.1
10-14 years	40	13.8
15 years and over	84	29.0
Total	287	99.0
Missing data	3	1
Total	290	100.0

Table 6.6 Education level of participants

Education level	Frequency	Percent
High School	25	8.6
Certificate/Diploma	54	18.6
Undergraduate Degree	115	39.7
Post-graduate degree	68	23.4
Professional Qualification	24	8.3
10	1	.3
Total	287	99.0
Missing data	3	1.0
Total	290	100.0

Table 6.7 Employment sector of participant

Employment sector	Frequency	Percent
Agriculture, forestry & fishing	2	.7
Electricity, Gas, Water & Waste Services	5	1.7
Construction	11	3.8
Wholesale Trade	14	4.8
Retail Trade	31	10.7
Accommodation & Food Sector	13	4.5
Transport, Postal & Warehousing	18	6.2
Information media & telecommunications	36	12.4
Financial & Insurance Industry	28	9.7
Professional, scientific & technical services	25	8.6
Administrative & support services	34	11.7
Public administration & safety	6	2.1
Education & training	34	11.7
Health care & social services	9	3.1
Arts & recreation services	7	2.4
Others	14	4.8
Total	287	99.0
Missing data	3	1.0
Total	290	100.0

Although a convenience sampling approach was adopted for the main study, the profile of the sample presents a broad spectrum of New Zealanders. In terms of gender, the mix is fairly even; about 50% of the sample is from the 20-30 age group, while the remaining 50% represents the 31-60 age groups. Approximately 57% of the sample respondents are in front-line jobs and the remaining 43% are represented by middle and senior levels of management. In terms of work experience, approximately 60% of the respondents have more than five years work experience. In the context of education levels, approximately 25% of the sample have diploma, certificate and high school education, while the remaining 75 have tertiary and professional education. Finally all employment sectors of the NZSIC are represented in the sample population as shown in Table 6.7. Overall, the profile of the respondents reflects a wide spectrum of New Zealanders in terms of age, gender, occupational status and work experience.

### 6.3 Preliminary data screening

The primary techniques for analysing the causal relationships between the constructs in the research model are confirmatory factor analysis (CFA) and structural equation modelling (SEM). One important prerequisite for CFA and SEM analysis is that the dataset satisfies the conditions for parametric data. (Field, 2005; Hair et al., 2006; Tabachnick & Fidell, 2007). The two basic assumptions assessed are first, whether the variables within the dataset conform to normal distribution requirements and second, whether the data shows homogeneity of variance (Field, 2005; Tabachnick & Fidell, 2007).

#### 6.3.1 Testing normal distribution assumption

There are two approaches to assess the normality of distributions in the dataset. The first approach is by visual inspections of graphs produced (in this instance by the SPSS descriptive “explore” procedure). The graphs provide a visual indication of the degree of skewness and kurtosis in the dataset. The extent of the deviations of skewness and kurtosis from a normal distribution are noted; this visual inspection of each measurement scale item reveals a normal distribution for the kurtosis criteria. However, the dataset indicates some degree of non-normality for a number of items with respect to skewness. Appendix 8 shows the histograms produced by the SPSS procedure to assess normal distribution for each item in the dataset.

The second approach for screening the dataset for normality is calculating Z scores for skewness and kurtosis and comparing the Z-score with a recommended cut-off benchmark. A ‘Z score’ is a standardised score with a mean of zero; any score deviating from the mean indicates non-normality in the data. Field (2005) suggests a score larger than one standard deviation is ( $\pm 1.96$ ) is indicative of non-normality in the

data. Appendix 9 below shows the Z-scores for the kurtosis criteria are well within prescribed benchmark of  $\pm 1.96$ . However, the Z-scores for skewness for a number of measurement scale items are outside the prescribed limit, suggesting some degree of non-normal distribution in the dataset.

Tabachnik & Fidell (2007) suggest that non-normality of data arising from skewness is less of a problem for multivariate analysis. Furthermore Byrne (2001) indicates that there is a tendency for “real world data” to not conform stringently to the normal distribution assumption. Overall, the descriptive analysis for a normal distribution in the dataset reveals some level of skewness in some of the measurement scale items in the dataset. However, the caveats provided by Tabachnik and Fidell (2007) and Byrne (2001) provides support to proceed with multivariate CFA and SEM analysis, despite the mild degree of non-normality noted in the dataset

### 6.3.2 Testing homogeneity of variance assumption

To mitigate the potential order bias, each questionnaire adopts a different order of sequence for the scale items (Field & Hole, 2003), as discussed in the previous chapter. Levene's test for homogeneity of variance shows the variance for all measurement scale items (except for one item only, CC2) are  $> 0.05$ , which indicates that the sequence of order of presentation of the scale items do not adversely affect the homogeneity of variances in the dataset (Field, 2005).

Table 6.8 Testing homogeneity of variance

Scale item	Code	Levene's Statistic	df1	df2	Significance
Trust 1	T1	2.648	1	563	.104
Trust 2	T2	.236	1	563	.628
Trust 3	T3	.108	1	563	.742
Behavioural loyalty1	BL1	.036	1	563	.849
Behavioural loyalty 2	BL2	.246	1	563	.620
Behavioural loyalty 3	BL3	.024	1	563	.876
Relationship strength 7	RS7	1.481	1	563	.224
Relationship strength 8	RS8	2.541	1	563	.112
Relationship strength 9	RS9	.436	1	563	.509
Attitudinal loyalty 1)	AL1	1.066	1	563	.302
Attitudinal loyalty 3	AL2	1.985	1	563	.159
Attitudinal loyalty 4)	AL4	.136	1	563	.712
Satisfaction 1	S1	1.014	1	563	.314
Satisfaction 2	S2	.032	1	563	.859
Satisfaction 3	S3	.776	1	563	.379
Co-creation 2	CC2	4.948	1	563	.027
Co-creation 3)	CC3	.842	1	563	.359
Co-creation 5	CC5	3.271	1	563	.071
Co-creation 6	CC6	3.202	1	563	.074

### 6.3.3 Outlier assessment

The “explore” procedure in SPSS enables an analysis that identifies the extent of outliers in the dataset, through the inspection of box-plots. The inspection of the box-plots for each measurement items shows three cases of outliers falling outside the cut-off of 3.29 (Field, 2005).

A second approach to identifying outliers in the dataset is by creating Z-score tables of each of the measurement items in the dataset. The Z-score tables found in Appendix 10 indicate that about 4.3% of the cases fall within the Z-scores of 2 - 3.25. This result suggests only a moderate level of outliers in the dataset. Although the number of outliers exceed the suggested outliers threshold of 1% (Field, 2005), the decision to proceed with the analysis without transforming the data is made on the basis

that outliers may represent an extreme segment of the population in the dataset (Tabachnick & Fidell, 2007).

#### 6.4 Preliminary multivariate analysis

##### 6.4.1 Exploratory factor analysis

The measurement items for each construct are assessed for parsimony by the exploratory factor analysis procedure. The measurement items for each of the constructs are as follows: co-creation (5 items), trust (3 items), behavioural loyalty (4 items) relationship strength (7 items), attitudinal loyalty (4 items) and satisfaction (3 items). Table 6.9 presents the first iteration of the exploratory factor analysis. The table shows that most items load on to their focal constructs. However, Table 6.9 indicates that a few measurement items do cross-load.



Table 6.9 EFA - Iteration 1 eigenvalues and total variance explained

	CC	AL	BL	TRST	RS	SAT
Trust-1				.693		
Trust 2		.346		.681		
Trust 3		.368		.730		
Behavioural Loyalty 1	.310	.532	.409			.326
Behavioural Loyalty			.729			
Behavioural Loyalty 3	.329	.469	.504	.319		
Behavioural Loyalty 4		.768				
Relationship Strength 3	.395	.371	.370			.378
Relationship Strength 4			.610		.522	
Relationship Strength 5	.456		.593	.304		
Relationship Strength 6					.369	.796
Relationship Strength 7		.571			.517	
Relationship Strength 8					.829	
Relationship Strength 9		.324			.757	
Attitudinal Loyalty 1		.726			.328	
Attitudinal Loyalty 2	.403	.524	.367			.357
Attitudinal Loyalty 3		.634				
Attitudinal Loyalty 4		.743				
Satisfaction 1	.401	.430	.303			.436
Satisfaction 2	.412		.427	.358		.408
Satisfaction 3	.462	.333	.390	.348		.349
Co-creation 1	.639	.428			.312	
Co-creation 2	.737		.301			
Co-creation 3	.799					
Co-creation 5	.810					
Co-creation 6	.801					
Extraction Method: Principal Component Analysis						
Rotation Method: Varimax with Kaiser Normalisation						

Table 6.10 examines the wording and phrasing of each the cross-loading measurement items in the survey instrument and offers a possible explanation as to why each of these items are cross-loading on multiple constructs, or have a weak loading on the focal construct. The last column of Table 6.10 shows the recommended action for the particular measurement item.

Table 6.10: Analysis of construct items with multiple cross-loadings

Items	Construct	Item wording in questionnaire	Statistical reasons	Theoretical reason	Action recommended
AL2	Attitudinal Loyalty	<i>If I had to do it all over again, I would do business with this travel agency</i>	This item cross loads on multiple constructs	The wording for this item shows it likely measures behavioural loyalty	Drop item
BL4	Behavioural Loyalty	<i>I am not likely to switch to another travel agency</i>	The EFA analysis shows this item cross load on to the Attitudinal Loyalty construct	BL4 is worded negatively	Drop item
RS3	Relationship Strength	<i>I like my interactions with this travel agency</i>	Item cross-loading on multiple constructs except for the focal construct it should be loading on i.e. Relationship Strength	RS3 is worded closely in meaning to items in co-creation construct	Drop item
RS4	Relationship Strength	<i>This travel agency makes a strong effort to get to know me</i>	Item cross-loads on multiple constructs except for focal construct i.e. Relationship Strength	RS4 is phrased to measure supplier behaviour	Drop item
RS5	Relationship Strength	<i>This travel agency is flexible and adaptable in dealing with me</i>	Item cross-loads on multiple constructs except for focal construct i.e. Relationship Strength	RS5 is phrased to measure supplier behaviour	Drop item
RS6	Relationship Strength	<i>I am willing to share information and knowledge with this travel agency</i>	Item cross-load strongly on to the satisfaction than the focal construct of Relationship Strength	RS6 phrase to measure customer behaviour intention	Drop item

CC1	Co-creation	<i>The travel agency went out of its way to work with me</i>	Item cross-loads on attitudinal loyalty construct	Retain item in dataset
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Table 6.11 show the results of the second iteration of exploratory analysis after dropping most items that have multiple cross-loadings. The results in Table 6.11 show that each construct item loads on its focal construct strongly, and does not cross-load onto other constructs, with the sole exception of the Relationship Strength 7 (RS7) which cross-loads on the Attitudinal Loyalty construct. Nunnally's suggestion of having a minimum of three items for each construct provides the basis for retaining this item for the Relationship Strength construct (Bhattacharjee, 2001). In any case, CFA analysis provides another opportunity to assess if this item is sufficiently uni-dimensional to the Relationship Strength construct. Apart from this item, the results of the second exploratory factor analysis demonstrate uni-dimensionality for the measurement items for each construct in the research model.

Table 6.11 EFA iteration 2 eigenvalues and total variance explained

	CC	AL	RL	TRST	BL	SAT
Co-creation 3	.808					
Co-creation 5	.805					
Co-creation 6	.791					
Co-creation 2	.763					
Co-creation 1	.592	.483				
Attitudinal Loyalty 4		.789				
Attitudinal Loyalty 3		.700				
Attitudinal Loyalty 1		.648	.342			
Relationship Strength 8			.872			
Relationship Strength 9			.817			
Relationship Strength 7		.516	.545		.325	
Trust 3		.309		.784		
Trust 2				.689		
Trust-1			.307	.612		.466
Behavioural Loyalty 2	.303				.709	
Behavioural Loyalty 3	.345	.336		.302	.647	
Behavioural Loyalty 1	.311	.389			.593	
Satisfaction 2	.346				.319	.705
Satisfaction 1	.326	.406				.606
Satisfaction 3	.406				.337	.579
Extraction Method: Principal Component Analysis						
Rotation Method: Varimax with Kaiser Normalisation						

#### 6.4.2 Assessing reliability

Following the exploratory factor analysis, the measurement scale items are assessed for internal consistency. The reliability analysis procedure in SPSS generates Cronbach Alpha scores to assess whether measurement scale items representing a specific construct present strong levels of co-variation. In general, scores of 0.7 and larger are indicative of a strong level of internal consistency and hence an indication

that the measurement scale for a construct is reliable (Nunnally, 1978; Palmer & Hoffman, 2001; Parasuraman, 2005). Table 6.12 show the Cronbach Alpha scores are greater than 0.8 for each of the constructs. The internal consistency results in Table 6.12 thus presents evidence of reliability for the measurement items for the constructs.

Table 6.12 Reliability statistics

Constructs n-563	Cronbach's Alpha	No. of Items
Trust	.829	3
Behavioural loyalty	.879	3
Relationship strength	.868	3
Attitudinal loyalty	.840	3
Satisfaction	.853	3
Co-creation	.909	5

#### 6.4.3 Screening for multicollinearity

Prior to confirmatory factor and structural path analysis, the dataset is assessed for multicollinearity within the measurement scale items of constructs. Multicollinearity arises when the correlations between measurement items for one construct correlate excessively with measurement scale items of another. While correlations between items within each construct and across constructs are desirable in multivariate analysis, excessively high correlations create problems with the underlying assumptions concerning the independence of variables in the system.

When multicollinearity is severe in a dataset, CFA and SEM analysis may not generate a feasible solution (Byrne, 2001; Field, 2005; Schumacker & Lomax, 2004) Field (2005) indicates potential problems arising from multicollinearity in the dataset. First, multicollinearity leads to a Type II error, i.e. rejection of a good predictor. Second, multicollinearity reduces the ability to apportion out the contribution of the

unique variance and provide the correct weight of importance of each construct in a study. Third, multicollinearity generates instability in predictions.

Multicollinearity in the dataset is assessed by examining bivariate correlations of all measurement scale items of constructs in a study, as shown in Table 6.13. Field (2005) suggests that correlations  $> 0.8$  among construct items are indicative of multicollinearity. The bivariate correlations in Table 6.13 show that while the correlations between measurement scale items show strong association, there is no evidence of multicollinearity among the scale items for the constructs in the dataset. Confirmatory factor analysis outputs provide a second opportunity to detect multicollinearity in the dataset. The correlations from AMOS outputs in CFA were also examined for the presence of correlations greater than 1.00. The examination of the AMOS outputs for CFA did not reflect any problem with regard to the issue of multicollinearity in the multivariate analysis (Cheng, Lam, & Yeung, 2006).

Table 6.13 Bivariate correlations of measurement scale item for constructs

	T1	T2	T3	RI1	RI2	RI3	RS7	RS8	RS9	AL1	AL3	AL4	CC1	CC2	CC3	CC5	CC6	S1	S2	S3
T1	1	.594**	.577**	.520**	.532**	.514**	.497**	.425**	.441**	.466**	.460**	.395**	.399**	.430**	.482**	.451**	.474**	.548**	.534**	.574**
T2	.594**	1	.685**	.605**	.559**	.598**	.573**	.437**	.460**	.573**	.529**	.433**	.471**	.402**	.479**	.455**	.479**	.574**	.550**	.560**
T3	.577**	.685**	1	.549**	.505**	.619**	.533**	.390**	.421**	.533**	.534**	.472**	.419**	.416**	.473**	.437**	.473**	.525**	.489**	.554**
RI1	.520**	.605**	.549**	1	.666**	.740**	.659**	.446**	.490**	.616**	.611**	.542**	.516**	.506**	.535**	.584**	.595**	.672**	.575**	.658**
RI2	.532**	.559**	.505**	.666**	1	.715**	.581**	.391**	.431**	.518**	.494**	.430**	.464**	.494**	.541**	.516**	.534**	.575**	.604**	.620**
RI3	.514**	.598**	.619**	.740**	.715**	1	.599**	.374**	.435**	.568**	.583**	.534**	.516**	.536**	.572**	.580**	.583**	.640**	.624**	.670**
RS7	.497**	.573**	.533**	.659**	.581**	.599**	1	.638**	.688**	.715**	.660**	.642**	.595**	.443**	.509**	.492**	.550**	.574**	.455**	.568**
RS8	.425**	.437**	.390**	.446**	.391**	.374**	.638**	1	.735**	.514**	.462**	.424**	.448**	.276**	.334**	.272**	.365**	.383**	.290**	.321**
RS9	.441**	.460**	.421**	.490**	.431**	.435**	.688**	.735**	1	.551**	.517**	.497**	.470**	.271**	.359**	.329**	.410**	.443**	.349**	.401**
AL1	.466**	.573**	.533**	.616**	.518**	.568**	.715**	.514**	.551**	1	.633**	.620**	.536**	.338**	.389**	.409**	.469**	.561**	.397**	.515**
AL3	.460**	.529**	.534**	.611**	.494**	.583**	.660**	.462**	.517**	.633**	1	.656**	.575**	.423**	.454**	.477**	.535**	.599**	.463**	.568**
AL4	.395**	.433**	.472**	.542**	.430**	.534**	.642**	.424**	.497**	.620**	.656**	1	.541**	.337**	.415**	.468**	.485**	.514**	.395**	.440**
CC1	.399**	.471**	.419**	.516**	.464**	.516**	.595**	.448**	.470**	.536**	.575**	.541**	1	.511**	.632**	.606**	.685**	.573**	.476**	.562**
CC2	.430**	.402**	.416**	.506**	.494**	.536**	.443**	.276**	.271**	.338**	.423**	.337**	.511**	1	.659**	.651**	.678**	.498**	.512**	.569**
CC3	.482**	.479**	.473**	.535**	.541**	.572**	.509**	.334**	.359**	.389**	.454**	.415**	.632**	.659**	1	.762**	.752**	.564**	.553**	.591**
CC5	.451**	.455**	.437**	.584**	.516**	.580**	.492**	.272**	.329**	.409**	.477**	.468**	.606**	.651**	.762**	1	.790**	.555**	.556**	.600**
CC6	.474**	.479**	.473**	.595**	.534**	.583**	.550**	.365**	.410**	.469**	.535**	.485**	.685**	.678**	.752**	.790**	1	.611**	.554**	.625**
S1	.548**	.574**	.525**	.672**	.575**	.640**	.574**	.383**	.443**	.561**	.599**	.514**	.573**	.498**	.564**	.555**	.611**	1	.630**	.673**
S2	.534**	.550**	.489**	.575**	.604**	.624**	.455**	.290**	.349**	.397**	.463**	.395**	.476**	.512**	.553**	.556**	.554**	.630**	1	.678**
S3	.574**	.560**	.554**	.658**	.620**	.670**	.568**	.321**	.401**	.515**	.568**	.440**	.562**	.569**	.591**	.600**	.625**	.673**	.678**	1

## 6.5 Measurement model

This study adopts the recommended two-step process, as recommended by Anderson & Gerbing (1988), when using CFA and SEM analytical methods. Step one consists of the development of a measurement model, while step two entails the development of the structural model to empirically test the causal relationships in the research model (Anderson & Gerbing, 1988; Schumacker & Lomax, 2004). The purpose of developing a measurement model prior to generating the structural model is to confirm reliability, convergent and discriminant validity for the constructs in the hypothesised research model.

Confirmatory factor analysis is a recommended statistical technique to confirm factorial validity of theoretically hypothesised constructs. The measurement model for this study uses the maximum likelihood extraction method and the sample size for the confirmatory factor analysis comprises of 563 completed survey responses. Model fit assessment is by way of examining and evaluating the CFA outputs. The analysis and interpretation of the CFA outputs identifies the extent of the goodness of fit for a measurement model. The specific CFA outputs for analysis are first, the overall global fit statistics, second, regression weights estimates, third, the modification indices and the standardised residual covariance matrix (Byrne, 2001; Schumacker & Lomax, 2004). The examination of the specific CFA outputs provides the basis to identify whether the measurement model satisfies the requirements for good fit or if the measurement model requires modifications and re-specification. Interpretation of the CFA outputs provides the basis to identify sources of misfit in the measurement model. Any evidence of poor fit may require re-specification of the measurement model.



However any re-specification or modifications to the measurement model requires theoretical support for modifying the measurement model (Byrne, 2001; Schumacker & Lomax, 2004).

Tables 6.14(a) and 6.14 (b) present an iterative approach to generating the final measurement model for the main phase of the study. Model 3 represents the final measurement model, arising from the outcomes of three CFA iterations. Model 1 represents the first iteration in generating the measurement model. Model 2 represents modifications and re-specification of Model 1, while Model 3 shows re-specifications and modifications from Model 2.

Table 6.14(a) Summary of three iterations to generate final measurement model

Step	Model 1 – Iteration 1	Model 2 – Iteration 2	Model 3 – Iteration 3
Statistical Analysis	Confirmatory Factor Analysis (CFA) – AMOS 17.0	Confirmatory Factor Analysis (CFA) – AMOS 17.0	Confirmatory Factor Analysis (CFA) – AMOS 17.0
Estimation Method	Maximum Likelihood Estimation	Maximum Likelihood Estimation	Maximum Likelihood Estimation
Sample size	N=563	N=563	N=563
Action	CFA of 6 constructs comprising 20 items from the EFA stage tested in confirmatory factor analysis	CFA of 6 constructs comprising 20 items + cross-loading of error correlations between-rs8 and e-rs9	CFA of 6 constructs comprising 19 items + cross-loading of error correlations between-rs8 and e-rs9 + CC 1 trimmed from model 2
Inspection of Parameter Estimates	All factor regression and covariance and variance loadings and variances are significant since all critical ratios exceed +/-1.96 cut-off  No extremes in standard errors	All factor regression and covariance and variance loadings and variances are significant since all critical ratios exceed +/-1.96 cut-off  No extremes in standard errors	All factor regression and covariance and variance loadings and variances are significant since all critical ratios exceed +/-1.96 cut-off  No extremes in standard errors
Inspection of Modification Indices	Modification indices indicate correlations between e-rs8 and e-rs9 are high  Modification indices show high level of cross-loading between CC1 on attitudinal loyalty	Model 2 shows overall improvement in goodness of fits statistics compared to Model 1  Inspection of modification indices shows that the CC1 item is cross-loading on the attitudinal loyalty construct  Modification indices indicate deleting item CC1 may improve overall goodness of fit results. The EFA analysis presented evidence of CC1 cross-loading on attitudinal loyalty	Model 3 show shows overall improvements in goodness of fit statistics  Modification indices do not do not indicate cross-loadings. Therefore this suggests that this model does not warrant any further modifications

Table 6.14(a) continued from previous page

Inspection of standardised residual matrix	Any item > 2.58 indicates misfit between pairs of items  Evidence of misfit between items RS↔CC1 - 3.704; CC1↔AL4 - 3.456; CC1↔AL3 - 3.670	Any item > 2.58 indicates misfit between pairs of items  CC1↔RS7 - 3.10; CC1↔AL4 - 3.457; CC1↔RS9 -2.80; CC1↔RS8 -2.924; CC1↔AL1 -2.695; CC1↔AL3 -3.704	No evidence of misfit in standardised residual matrix
Theoretical Justification	Inspection of the phrasing of rs8 and rs9 suggests that the phrasing of these is similar.	Inspection of the phrasing of item CC1 shows this item focuses on the supplier rather than buyer-supplier co-creation	
Action for next round of CFA	On this theoretical basis the error correlations are freed to cross-load between e-rs8 and e-rs9,	Both for theoretical and statistical reasons, CC1 is trimmed for the next round of CFA	This model represents the final model for generating the structural model Final measurement model

Table 6.14(b) Measurement models – Goodness of fit statistics for CFA

		Model 1 – Iteration 1	Model 2 – Iteration 2	Model 3 – Iteration 3
Step		1	2	3
Statistical Analysis		Confirmatory Factor Analysis (CFA) – AMOS 17.0	Confirmatory Factor Analysis (CFA) – AMOS 17.0	Confirmatory Factor Analysis (CFA) – AMOS 17.0
Estimation Method		Maximum Likelihood Estimation	Maximum Likelihood Estimation	Maximum Likelihood Estimation
Sample size		N=563	N=563	N=563
		CFA of 6 constructs comprising 20 items from the EFA stage tested in confirmatory factor analysis	CFA of 6 constructs comprising 20 items with cross-loading of error correlations between-rs8 and e-rs9	CFA of 6 constructs comprising 19 items with cross-loading of error correlations between-rs8 and e-rs9. CC 1 trimmed from model 2 – total of 19 items for CFA
Goodness of fit statistics	CMIN/DF	3.759	2.976	2.458
	GFI	0.901	0.922	0.939
	AGFI	0.866	0.893	0.915
	SRMR	0.045	0.039	0.031
	RMSEA	0.70	0.059	0.051
	TLI	0.94	0.956	0.969
	CFI	0.95	0.964	0.975

Table 6.15 sets out a set of selected fit criterion (Hair et al., 2006) for assessing the goodness of fit for each of the three iterations of measurement models discussed in this section.

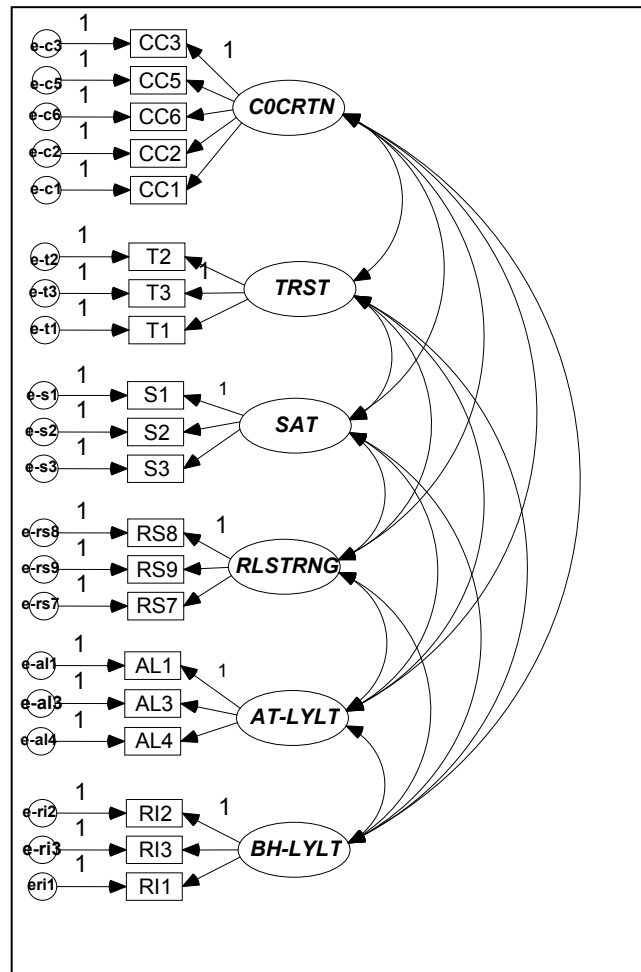
Table 6.15 Selected SEM criteria and thresholds to evaluate model fit

Criteria	Acceptable Fit Thresholds	Sources
Normed Chi-square (Chi square/df)	Between 1.0 - 3.0	(Hair et al., 2006)
Goodness of Fit (GFI)	$\geq 0.90$	(Hair et al., 2006)
Adjusted Goodness of Fit (AGFI)	$\geq 0.90$	(Anderson & Gerbing, 1988)
SRMR	$\leq 0.05$	(Hair et al., 2006)
RMSEA	$\leq 0.08$	(Hair et al., 2006)
TLI	$\geq 0.90$	(Hair et al., 2006)
CFI	$\geq 0.95$	(Hair et al., 2006)

#### 6.5.1 Iteration 1 - measurement model 1

Model 1(Figure 6.1) consists of 20 items making up the constructs from the exploratory factor analysis. The results of the confirmatory factor analysis show a chi-square of 582.65 with 155 degrees of freedom and a p value of  $\leq 0.001$ . The p value indicates that model fit is not satisfactory. However, Byrne (2001) suggest that p values are influenced by large sample sizes and sole reliance on the p value to assess model fit may mislead the researcher to conclude model misfit.

Figure 6.1 Iteration 1 – measurement model 1



The results of other global fit criteria for Model 1 are GFI = 0.901, AGFI = 0.866 SRMR = 0.045, RMSEA = 0.07, TLI = 0.94, CFI = 0.95. The comparison of the thresholds for each of these criteria from Table 6.15 shows that the GFI, SRMR, TLI and CFI fit indices for Model 1 suggest good fit while, the AGFI and RMSEA criteria indicate marginal fit.

The inspection of the regression parameter estimates for Model 1 shows all factor, covariance and variance loadings in Model 1 are significant and the critical ratios exceed  $\pm 1.96$  t-test value thresholds. The inspection of the standard errors in the factor, covariance and variance loadings do not present any unusually high or low

standard error estimates. Therefore, this suggests that the parameter estimates in Model 1 are acceptable.

Inspection of the covariance and regression modification indices show that e-rs8 and e-rs9 are highly correlated (105.628; 35.494). Additionally the modification indices show a high level of cross-loadings between CC1 and attitudinal loyalty and relationship strength items. This evidence of item misfit is further supported from evidence in the standardised residual covariance matrix which shows high correlations between RS7 ↔ CC1 (3.704), CC1 ↔ AL4 (3.456), CC1 ↔ AL3 (3.670). Byrne (2001) suggests the standardised covariance residual outputs are analogous to Z scores and any pair of items displaying Z-score greater than +/-2.58 indicates misfit between these items. From the modification indices inspection there is evidence of misfit between items of constructs in Model 1.

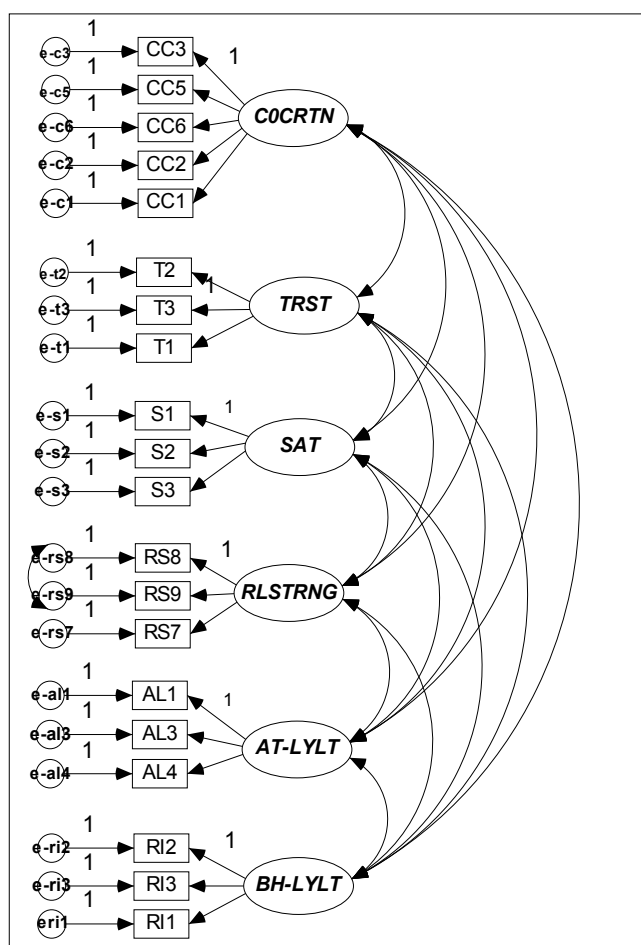
In the context of the high correlations between e-rs8 and e-rs9, Byrne (2001) suggests that “measurement error covariance represent systematic, rather than random, measurement error in item responses, and they may derive from characteristics specific to the items or to the respondents (Aish & Joreskog, 1990). For example, if these parameters reflect item characteristics, they may represent a small omitted factor. If, on the other hand, they represent respondent characteristics, they may reflect bias such as yea/nay saying and social desirability (Aish & Joreskog, 1990). Another type of method effect that can trigger correlated errors is a high degree of overlap in item content. Such redundancy occurs when an item, although worded differently, essentially asks the same question (p. 106)”. Byrne (2001) also suggests that freeing error correlations is only permissible when supported by theoretical and substantive reasoning. The inspection of the phrasing of the three indicators representing the relationship strength construct and the indicator items for the trust construct show similar phrasing in the stems of the indicators. Hence the similarity of the wording of

the items in the stems of the indicator items may reflect either content overlap or bias such as yea/nay saying, and social desirability (Aish & Joreskog). Either of these explanations may account for the error covariance and provide theoretical support for freeing the error correlations between  $ers8 \leftrightarrow ers9$ .

The evidence of misfit between items in a small number of construct items ( $CC1 \leftrightarrow AL3$ ;  $CC1 \leftrightarrow AL4$ ;  $CC1 \rightarrow RS7$ ) and the theoretical justification for freeing up the error correlation between  $e-rs8 \leftrightarrow e-rs9$  means that Model 1 requires modification and re-specification in a search for a better-fitting measurement model.

## 6.5.2 Iteration 2 - measurement model 2

Figure 6.2 Iteration 2 - measurement model 2





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Model 2 (Figure 6.2) consist of 20 items making up the six constructs as in Model 1. The difference between Model 2 and Model 1 is that the error correlations between e-rs8↔e-rs9 are freed to correlate with each other. The results for Model 2 (see Table 6.15b) show a chi-square of 458.35 with 154 degrees of freedom and a p value of  $\leq 0.001$ . As discussed earlier, a significant p value does not always mean poor model fit as the p value is influenced by a large sample size as in the present case. The results of other overall fit indices are Normed Chi-square (Chi-square/df) = 2.976; GFI = 0.92; AGFI = 0.893; SRMR = 0.039; RMSEA = 0.059; TLI = 0.956; and CFI = 0.964. The GFI, TLI, CLI and SRMR indices show close fit while the Normed chi-square, and RMSEA show moderately good fit. The Normed Chi-square and RMSEA are within acceptable limits, however these results are close to the ceiling end of fit thresholds (when compared to criteria in Table 6.15).

The inspection of the parameter estimates for Model 2 shows all factors, covariance and variance loadings in Model 2 are significant and the critical ratios exceed  $\pm 1.96$  t-test value threshold. The inspection of the standard errors in the factor, covariance and variance loadings do not present any unusually high or low standard error estimates. This suggests that the parameter estimates in Model 2 are acceptable.

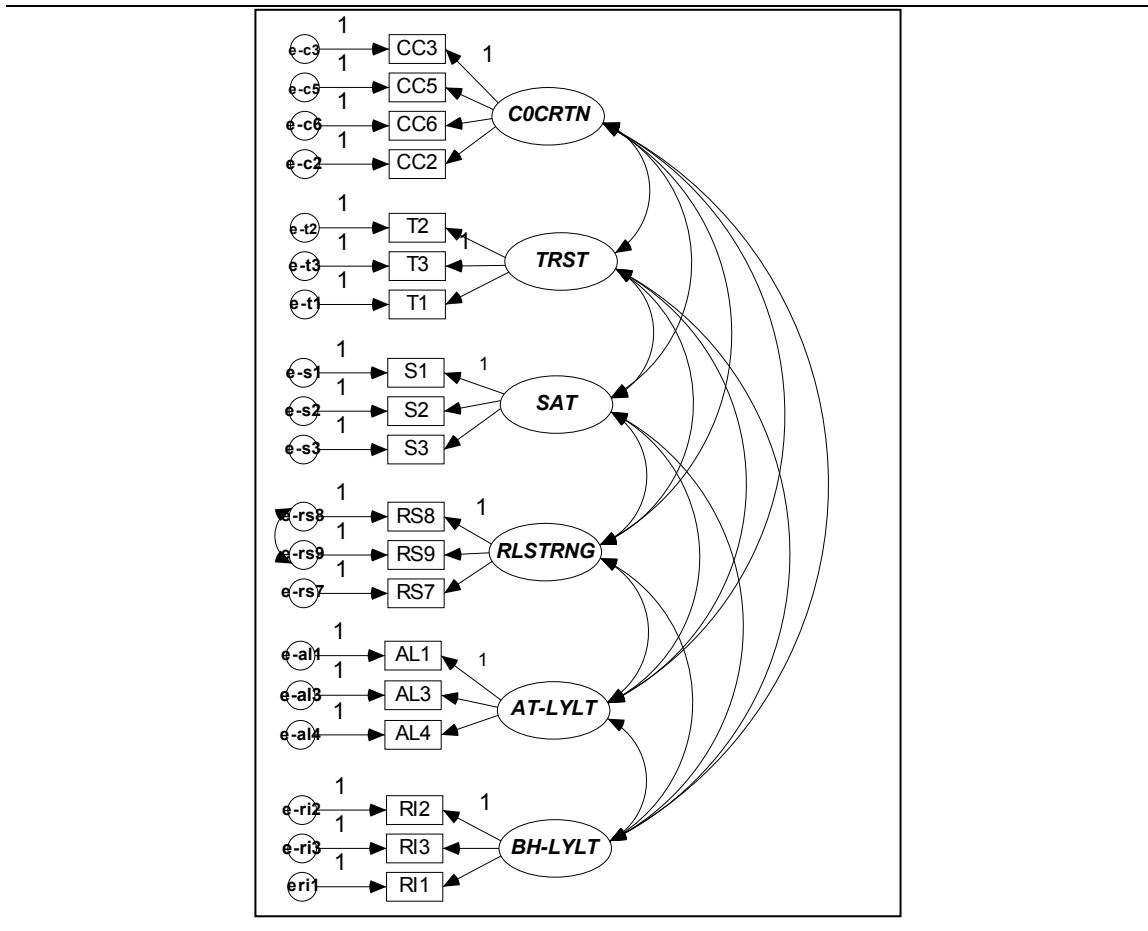
Inspection of the covariance and regression modification indices shows high correlations between CC1 ↔ RS7 (26.793); CC1 ↔ RS8 (32.148); CC1 ↔ RS9 (27.59); CC1 ↔ AL1 (32.12); CC1 ↔ AL3 (27.786); and CC1 ↔ AL4 (29.588). The modification indices suggest evidence of misfit by CC1 with items making up the relationship strength and attitudinal loyalty constructs. The standardised covariance residual CFA AMOS output confirms the potential source of misfit identified in the modification indices. The standardised covariance residuals shows high Z-scores above

the threshold of 2.58 for the following pair of items - CC1 ↔ RS7 (3.10); CC1 ↔ AL4 (3.457); CC1 ↔ RS9 (2.80); CC1 ↔ RS8 (2.924); CC1 ↔ AL1 (2.695); CC1 ↔ AL3 (3.704). Z-scores above +/-2.58 shows evidence of misfit between construct items in the measurement model 2 (Byrne, 2001). It is relevant to note that CC1 indicated evidence of cross loading with the attitudinal loyalty construct during the exploratory factor analysis phase of analysis.

The analysis of the CFA outputs from Model 2 suggests that trimming CC1 from the co-creation construct in the next CFA iteration may generate an improved measurement model. However as Byrne (2001) suggests, any modifications requires strong theoretical underpinnings. Inspection of the phrasing of CC1 shows that CC1 has a supplier focus, rather than a customer focus, while the remaining items for the co-creation construct presents a buyer-supplier focus. Theoretically, this suggests that the phrasing for CC1 is not consistent in comparison to other co-creation measurement items. Hence, the next CFA measurement model iteration drops CC1 from further analysis.

### 6.5.3 Iteration 3 - Measurement model 3

Figure 6.3 Iteration 3 - measurement model 3



Model 3 (Figure 6.3) represents the final CFA iteration to establish the measurement model. Figure 6.3 shows the items representing the constructs for Model 3. Model 3 consists of 19 items making up the six constructs. Model 3 retains the error correlation between e-rs8 and e-rs9 from Model 2. Additionally, CC1 trimmed from the items making up the co-creation construct for Model 3

The results for Model 3 (see Table 6.14b) show a chi-square of 334.23 with 136 degrees of freedom and a significance value of  $\leq 0.001$ . Other overall goodness of fit statistics show good fit. The overall fit statistics for model 3 are as follows: Normed chi-square (Chi-square/df) = 2.438, GFI = 0.939, AGFI = 0.915, SRMR = 0.031;

RMSEA = 0.05, TLI = 0.969, CFI = 0.975. The comparison of acceptable fit thresholds from Table 6.15 shows the results in Model 3 indicate close fit.

The inspection of the regression parameter estimates for Model 3 shows all factors, covariance and variance loadings in Model 3 are significant and the critical ratios exceed  $\pm 1.96$  t-test value threshold. The inspection of the standard errors in the factor, covariance and variance loadings do not present any unusually high or low standard error estimates. This suggests that the parameter estimates in Model 3 show close fit. Inspection of the covariance and regression modification indices does not display any evidence of misfit. The standardised covariance residual matrix does not contain any items with large Z-scores  $\geq$  than 2.58.

Overall, the CFA results in iteration 3 present strong evidence for accepting Model 3 to represent the measurement model for the main phase of this research. The acceptable fit of the measurement model enables the development of the structural model in the next stage of SEM analysis.

While the results of Model 3 were adopted for the development of the structural model, an additional CFA analysis of Model 3 without the correlated error between ers7 and ers8 shows fit statistics of Normed chi-square (Chi-square/df) = 3.347, GFI = 0.917, AGFI = 0.885, SRMR = 0.0378; RMSEA = 0.065, TLI = 0.950, CFI = 0.960. The comparison of the fit statistics between Model 3 and the latter model shows marginally poorer goodness of fit statistics in comparison to Model 3. However, the theoretical explanation for freeing the error correlation set out in Model 3, means the error correlations between ers7 and ers8 are retained for the development of the structural model. A final note to the CFA analysis is that when indicator items are purified in CFA analysis, the analysis is no longer considered confirmatory, instead the analysis reverts to an exploratory mode, as in the present case.

#### 6.5.4 Final list of purified measurement scale items for constructs

Table 6.16 presents the final list of purified measurement scale items for the study

Table 6.16 Purified scale items

Constructs	Scale Items	Reasons for dropping item(s)	Final Items retained in study
Co-creation	CC1***	CC1 trimmed in confirmatory analysis phase as this items cross-loads on other constructs this item	
	CC2	Retain item	CC2
	CC3	Retain item	CC3
	CC4*	Experts suggest dropping item as it does not reflect definition of construct	
	CC5	Retain item	CC5
	CC6	Retain item	CC6
Trust	T1	Retain item	T1
	T2	Retain item	T2
	T3	Retain item	T3
Satisfaction	S1	Retain item	S1
	S2	Retain item	S2
	S3	Retain item	S3
Relationship strength	RS1*	Expert recommend removal of RS1 & RS2 as these items do not reflect domain of construct as per	
	RS2*		
	RS3**		
	RS4**		
	RS5**		
	RS6**	RS3, RS4, RS5 cross-loads on other constructs in EFA. Decision to drop these items from analysis	
	RS7		RS7
	RS8		RS8
	RS9		RS9
Attitudinal loyalty	AL1	Retain item	AL1
	AL2**	Item cross-loads on multiple construct. On closer inspection, this item reflects behavioural loyalty. Therefore this item is not consistent with the definition of attitudinal loyalty. Hence the decision to drop item from further analysis	
	AL3	Retain item	AL3

Behavioural loyalty	RI_1	Retain item	RI1
	RI_2	Retain item	RI2
	RI_3	Retain item	RI3
	RI_4**	Negative phrased item reflecting switching behaviour, item dropped in EFA phase	
<hr/>			
	***	scale item deleted during CFA analysis:	
	**	scale items deleted during EFA ;	
	*	scale item deleted during pre-test phase	

#### 6.5.5 Adequacy of measurement model

Reliability, convergent and discriminant validity estimate scores of the constructs in a study provide evidence of measurement model adequacy. The strength of the statistical estimates provides evidence of the reliability and validity of the measurement items representing constructs in a particular research

##### *Reliability*

Reliability estimates are a measure of the internal consistency of the measurement items representing a construct in a specific study. Composite reliability estimates provides evidence of the internal consistency of measurement items for each construct in a study. Two methods are available to assess the composite reliability scores to evaluate the internal consistency of the measurement items for constructs. The two recommended methods are first, the Cronbach Alpha (Hensley, 1999; Peter, 1979) and, second, the Fornall and Lacker (1981) method (Fornell & Larcker, 1981; Ribbink, Van Riel, Liljander, & Streukens, 2004). There is debate in the literature that the latter method of assessing composite reliability is superior to the former method. However, both methods employ a floor level cut-off of 0.7 as an indication of the reliability of the measurement items representing a construct. Therefore, higher scores above the floor level benchmark suggest a stronger degree of composite reliability or the internal consistency of the items representing a construct.

Table 6.17 shows that all constructs in the main phase of this study satisfy the reliability estimates minimum cut-off of 0.70 for both the Cronbach Alpha and the Fornall and Lacker methods. Overall, the scores for each of the constructs provide strong evidence of sound internal consistency for the measures representing the constructs.

#### *Convergent validity*

Convergent validity is established when all the measurement items relating to specific construct correlates strongly onto the hypothesised construct. Convergent validity is assessed by examining t-values for the unstandardised regression coefficient loading for each measurement item exceeds the +/- 1.96 cut-off benchmark (Anderson & Gerbing, 1988; Byrne, 2001). Table 6.17 shows the t-values to be in excess of the minimum cut-off of +/-1.96 for every measurement item. Additionally, convergent validity is established when the average variance extracted (AVE) for each construct exceeds 0.5. Table 6.17 shows that the AVEs for all constructs are well in excess of the minimum 0.5 AVE cut-off. Thus, the critical t-value and AVE both offer strong evidence to support convergent validity for constructs in the measurement model in this study (Ribbink et al., 2004; White, Varadarajan, & Dacin, 2003).

Table 6.17 Factor loadings for measurement items of constructs

Constructs	Factor loadings	t-values	Standardised loadings	Mean	SD
<b>Attitudinal Loyalty (CR = 0.64; AVE = 0.796; Cronbach <math>\alpha</math> = 0.840)</b>					
AL1 I consider myself to be a loyal customer of this travel agency	1.00		0.82	4.52	1.36
AL3 I use this travel agency because it is the best choice for me	0.986	21.53	0.81	4.72	1.36
AL4 This travel agency is distinct from other travel agency companies	0.955	19.96	0.76	4.33	1.4
<b>Co-creation (CR = 0.824; AVE = 0.72; Cronbach <math>\alpha</math> = 0.910)</b>					
CC2 I contributed actively to my final customer marketing solution	0.801	21.53	0.761	5.67	1.09
CC3 My final marketing solution was arrived at through the joint efforts of this travel agency and me	1.00		0.86	5.56	1.21
CC5 My final customer solution evolved as a result of the active participation of this travel agency and me	1.05	27.249	0.88	5.6	1.24
CC6 Overall, I would describe my final customer solution as a high level of co-creation	1.04	27.98	0.89	5.49	1.21
<b>Behavioural Loyalty (CR = 0.816 ; AVE = 0.71 ; Cronbach <math>\alpha</math> = 0.879)</b>					
BL1 If I had a choice, I would use this travel agency again	1.086	23.13	0.86	5.32	1.23
BL2 I am likely to go back to this travel agency the next time I need airline tickets or travel related services	1.00		0.79	5.45	1.22
BL3 I am likely to repurchase from this travel agency in the future	1.09	23.54	0.87	5.26	1.22



Table 6.17 continued from previous page

<b>Relationship Strength (CR = 0.741; AVE = 0.61 ; Cronbach <math>\alpha</math> = 0.868)</b>						
RS7	My relationship with this specific travel agency is strong	1.32	18.04	0.95	4.58	1.31
RS8	My relationship to this travel agency is important to me	1.00		0.67	4.75	1.41
RS9	My relationship to this specific travel agency is something I care about	1.06	21.67	0.73	4.59	1.38
<b>Satisfaction (CR = 0.779; AVE = 0.66 ; Cronbach <math>\alpha</math> = 0.853)</b>						
S1	I think I did the right thing when I chose this travel agency	1.00		0.81	5.39	1.11
S2	The product and service offerings of this travel agency meet my expectations	0.94	20.76	0.78	5.73	1.08
S3	Overall, I am pleased with the product and service offerings of this travel agency	1.00	23.15	0.84	5.65	1.06
<b>Trust (CR = 0.747 ; AVE = 0.62; Cronbach <math>\alpha</math> = 0.829)</b>						
T1	In our relationship, this travel agency can be counted to do what is right	0.81	18.13	0.73	5.26	1.09
T2	In our relationship, this travel agency has high integrity	0.978	21.09	0.83	5.14	1.16
T3	In our relationship, this travel agency can be trusted at all times	1.00		0.80	4.93	1.23

Note CR (Fornall & Lacker method) = Composite Reliability; AVE = average variance extracted

### *Discriminant validity*

Discriminant validity occurs when the measurement items for each specific construct in a research study correlate strongly on the hypothesised construct and do not correlate strongly on any construct other than as hypothesised. This is to say that the measurement items for each construct are mutually exclusive to their focal construct in the research model. For example, in this study the co-creation measurement items correlates strongly with the co-creation construct, and, do not correlate, or correlate weakly with other constructs in the hypothesised research model. Discriminant validity is established when the square root of the average variance extracted is greater than the correlations between items as in Table 6.18 (Ribbink et al., 2004; White et al., 2003). The diagonal cells in Table 6.18 contain the square root of the average variance extracted (AVEs) for each construct. Table 6.18 shows the square root of the AVE exceeds the correlations both in each corresponding column and across the corresponding row in Table 6.18. Discriminant validity for the constructs in the study is thus established.

Table 6.18 - Discriminant validity

Constructs	Mean	SD	1	2	3	4	5	6
Co-creation	5.58	0.95	<b>0.847</b>					
Trust	5.11	1	.593**	<b>0.789</b>				
Satisfaction	5.59	0.95	.725**	.717**	<b>0.813</b>			
Relationship Strength	4.64	1.22	.484**	.601**	.534**	<b>0.782</b>		
Attitudinal Loyalty	4.52	1.19	.563**	.651**	.646**	.711**	<b>0.796</b>	
Behavioural Loyalty	5.38	1.14	.648**	.678**	.748**	.560**	.624**	<b>0.84</b>

Notes \* Correlation is significant at 0.05 level (two tailed) ; \*\* correlation is significant at 0.01 level (two tailed)

## 6.6 Structural model

This section of the analysis presents the results of the structural path model in the development of the structural model. Following the recommended two-step procedure in structural equation modelling, Step 2 represents the development of the structural path model to empirically test the hypothesised relationships in the research model (Anderson & Gerbing, 1988).

Table 6.19 Structural model Goodness of Fit Statistics

Criteria	Results for structural model	Acceptable Fit Threshold
CMIN/DF	2.417	Between 1.00 – 3.00
GFI	0.938	$\geq 0.9$
AGFI	0.916	$\geq 0.9$
SRMR	0.031	$\leq 0.05$
RMSEA	0.050	$\leq 0.08$
TLI	0.970	$\geq 0.9$
CFI	0.975	$\geq 0.95$

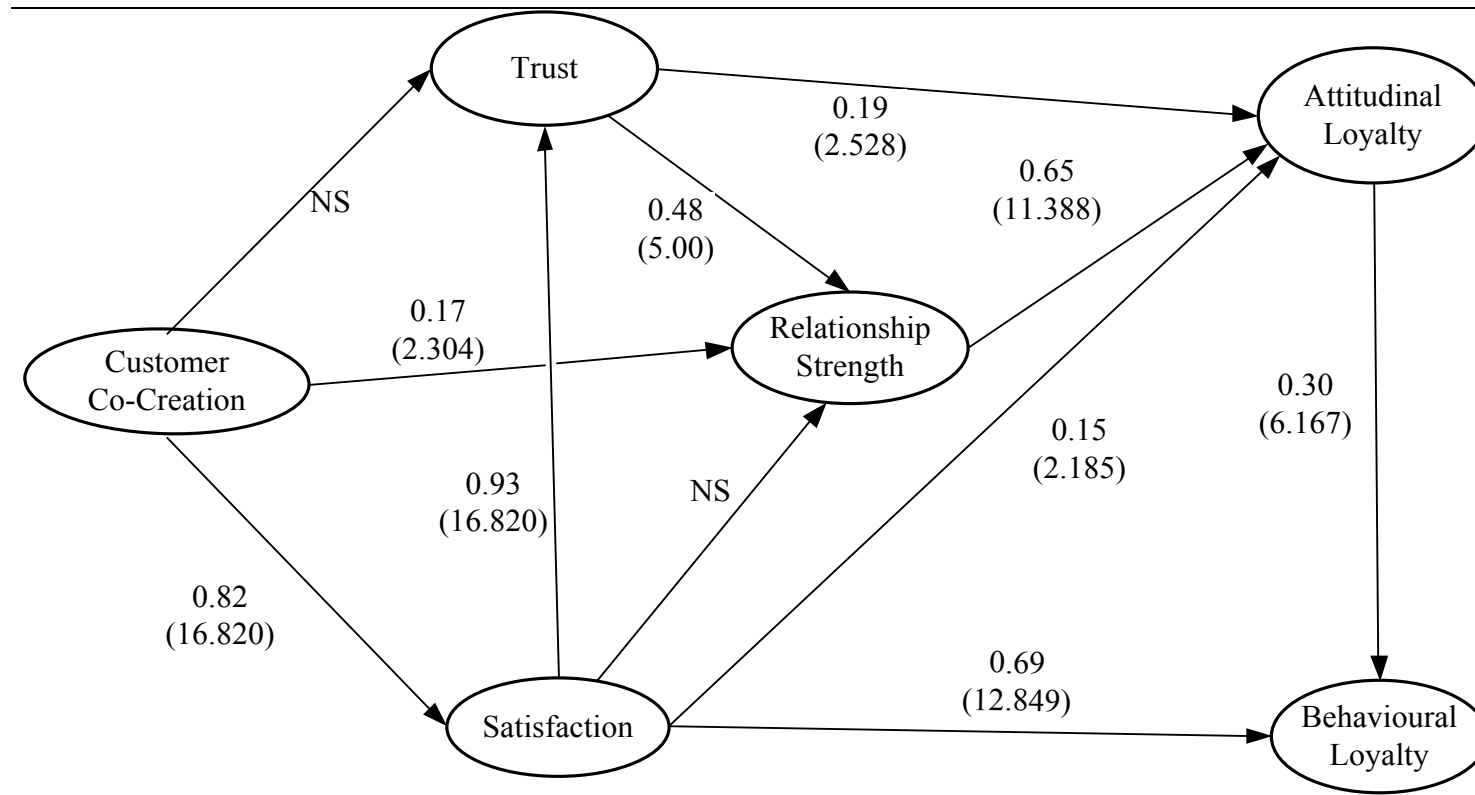
Table 6.19 presents the goodness of fit indices results for the overall structural model for the full dataset. Inspection of the goodness fit statistics against acceptable fit thresholds in Table 6.19 shows close fit for the structural model.

The regression estimates for the structural model are shown in Table 6.20 and Figure 6.4 below. All factor loadings and structural paths are significant except for the paths between Co-creation  $\rightarrow$  Trust and Satisfaction  $\rightarrow$  Relationship Strength.

Table 6.20 Parameter estimates, t-values & significance levels

Parameters (n-563)	Unstandardised estimate	Standardised estimate	t-value	Significance level
Co-creation → Satisfaction	0.885	0.822	16.820	$p \leq 0.01$
Satisfaction → Trust	0.998	0.926	11.291	$p \leq 0.01$
Co-creation → Trust	-0.107	-0.092	-1.270	NS
Satisfaction → Relationship Strength	0.161	0.143	1.124	NS
Trust → Relationship Strength	0.504	0.484	5.000	$p \leq 0.01$
Co-creation → Relationship Strength	0.208	0.172	2.304	$p \leq 0.05$
Trust → Attitudinal Loyalty	0.221	0.192	2.528	$p \leq 0.05$
Relationship Strength → Attitudinal Loyalty	0.723	0.653	11.388	$p \leq 0.01$
Satisfaction → Attitudinal Loyalty	0.188	0.151	2.185	$p \leq 0.05$
Satisfaction → Behavioural Loyalty	0.813	0.690	12.849	$p \leq 0.01$
Attitudinal Loyalty → Behavioural Loyalty	0.286	0.301	6.167	$p \leq 0.05$

Figure 6.4 Structural model with standardised parameter estimates and t-values



## 6.7 Multi-group invariance analysis

Following the development of the structural model from the dataset, the analysis shifts to testing the effects of the different contexts of co-creation in the quasi-experiments. The two main contexts for co-creation are first, market (B2B v B2C market contexts) and, second, product and service contexts. The multi-group invariance testing (MGIT) procedure in SEM analysis provides the analytical tool to test for the effects of the multi-contexts of the quasi-experiments in the structural models for each of the contexts of co-creation in this study (Byrne, 2001; Glynn, 2007; White et al., 2003).

### 6.7.1 Preparatory steps prior to multi-groups invariance testing (MGIT)

The initial step for MGIT is assessing the fit of the overall global structural model. A good-fitting global model is a precursor for multi-groups invariance testing. A second prerequisite in multi-groups invariance testing is assessing the goodness of fit of each of the business contexts in a single-group analysis. Satisfactory goodness of fit and parameter estimates in single-group analysis enables the researcher to proceed with the third and final phase of multi-groups invariance testing. In the final stage the structural model paths are simultaneously analysed for invariance between comparable SEM models (Byrne, 2001).

### 6.7.2 MGIT procedure for B2B /B2C market co-creation contexts

The first step in simultaneous multi-groups invariance analysis requires the generation of an unconstrained baseline model. This baseline model produces the  $\chi^2$ , DF and other goodness of fit statistics that provide the benchmark indicators to compare subsequent, constrained, models. The testing procedure then incrementally and

systematically constrains factor loadings and structural paths in subsequent models.

The  $\chi^2$ , DF and selected goodness of fit statistics of the constrained model is compared against the baseline model for statistical significance for the constrained path. In a systematic approach, all factor loadings and structural paths are incrementally constrained equal until the entire model is completely constrained. If the result for a specific path shows no statistical significance, the conclusion is that this structural path is invariant across the compared models.

Byrne (2001) recommends an ordered sequence for imposing constraints in multi-groups invariance testing. The sequence suggests constraining factor loadings first, followed by structural paths and latent means of constructs. Byrne (2001) also indicates that constraining of error correlations and residuals is unduly restrictive and it is accepted practice not to test for invariance for error correlations and residuals unless theory dictates.

### 6.7.3 MGIT- the effects of market contexts (B2B v B2C) on co-creation

Table 6.21 Single group goodness of fit for B2B and B2C market contexts

Model	Cmin/df	GFI	AGFI	SRMR	RMSEA	TLI	CFI	AIC	BCC
Global Model N = 563	2.417	0.938	0.916	0.031	0.05	0.975	0.975	438.43	442.12
B2B Market N = 281	2.218	0.892	0.853	0.037	0.06	0.944	0.954	410.49	418.18
B2C Market N = 282	1.776	0.913	0.882	0.043	0.053	0.97	0.976	348.67	356.34

The first row in Table 6.21 shows that the overall structural model has good fit in comparison to the goodness of fitness thresholds in Table 6.16. Single group analysis of the B2B and B2C market contexts structural path models as shown in Table 6.16 also

shows acceptable goodness of fit statistic in line with the goodness of fit thresholds. The GFI statistic for the B2B market context is marginally below the threshold in one case only, however all other goodness of fit statistics are within acceptable limits. The AIC and BCC statistics in particular suggest that the B2B and B2C market context structural models have good fit. The AIC and BCC statistics are relative measures of fit providing a means to compare models (Byrne, 2001; Rosenbaum & Spears, 2009). A decrease in size for the AIC and BCC statistic shows improved model fit for both the B2B and B2C contexts, and these statistics suggest good fit in relation to the overall global structural model. These fit statistics are generally satisfactory.

Table 6.22 below shows the standardised regression estimates for the single group models between the B2B and B2C market contexts. The variances between the regression path estimates suggest some degree of difference between the B2B and B2C market contexts. Table 6.22 shows apparent difference in the Co-creation → Relationship Strength, Trust → Relationship Strength, Trust → Attitudinal Loyalty, Satisfaction → Relationship Strength, Satisfaction → Behavioural Loyalty and Attitudinal Loyalty → Behavioural Loyalty paths. Hence, the comparison of each path simultaneously in the multi-group invariance procedure in SEM analysis will establish if these apparent differences in the strength of the structural paths are significant.



Table 6.22 Single group's regressions estimates for B2B, B2C market contexts

Parameters	B2B Market Structural Model estimates N = 281		B2C Market Structural Model Estimates N = 282			Global Structural Model Estimates N= 563	
	Standard estimates	<i>t-values</i>	Standard estimates	<i>t-values</i>		Standard estimates	<i>t-values</i>
Co-creation → Satisfaction	0.81	10.9	0.80	13.75		0.82	16.82
Co-creation → Trust	0.12	-1.16 NS	0.06	-0.71 NS		-0.09	-1.27 NS
Co-creation → Relationship Strength	0.08	-0.07 NS	0.36	3.47		0.21	2.30
Satisfaction → Trust	0.96	7.54	0.90	8.06		0.93	11.29
Trust → Relationship Strength	0.55	3.27	0.42	3.49		0.48	5.00
Trust → Attitudinal Loyalty	0.17	1.21 NS	0.22	2.50		0.19	2.53
Satisfaction → Relationship Strength	0.24	1.18 NS	0.03	0.19 NS		0.14	1.12 NS
Relationship Strength – Attitudinal Loyalty	0.64	6.77	0.66	9.34		0.65	11.38
Satisfaction → Behavioural Loyalty	0.80	9.67	0.59	8.54		0.81	12.85
Attitudinal Loyalty – Behavioural Loyalty	0.20	2.76	0.39	5.77		0.29	6.17
Satisfaction – Attitudinal Loyalty	0.15 NS	9.68	0.16 NS	1.92		0.15	2.19

Multi-group invariance (MGIT) analysis provides the means to statistically test differences in B2B and B2C market contexts for co-creation and its marketing outcomes (Byrne, 2001). Tables 6.23 and 6.24 show the results of the multi-groups invariance analysis for the B2B and B2C markets contexts. Overall, the results show invariance between them. The only variance noted is the structural path between trust and relationship strength in model 7. Overall, the MGIT suggests that the difference between the B2B and B2C contexts are minimal.

Table 6.24 shows the AIC, BCC, CFI, RMSEA and SRMR fit indices shows Model 14 as the best fitting model. As Model 14 represents the most constrained model in the multi-group invariance analysis in Table 6.24 and 6.25, the results in the tables point to invariance between the structural paths for the B2B and B2C market contexts (Byrne, 2001). While single groups analysis suggest differences in some structural paths, statistical evidence from multi-group analysis confirms invariance for all paths, but one

Table 6.23 MGIT - comparing  $\chi^2$  differences for B2B & B2C markets

Model	Model Description	Comparative Model	$\chi^2$	d/f	$\Delta\chi^2$	$\Delta$ d/f	Critical value cut-off @ (0.05) level	Statistical significance
Model 1	Unconstrained Baseline Model		559.2	280	-	-	-	
Model 2	All factor loadings constrained equal	2 : 1	568.1	293	8.9	13	22.36	ns
Model 3	Model 2 + P1 Co-creation $\rightarrow$ Satisfaction equal	3 : 1	578.0	294	18.8	14	23.68	ns
Model 4	Model 3 + P2 Co-creation $\rightarrow$ Trust equal	4 : 1	578.5	295	19.3	15	24.99	ns
Model 5	Model 4 + P3 Co-creation $\rightarrow$ Rel. Strength equal	5 : 1	585.1	296	25.9	16	26.29	ns
Model 6	Model 5 + P4 Satisfaction $\rightarrow$ Trust equal	6 : 1	585.2	297	26	17	27.58	ns
Model 7	Model 6 + P5 Trust $\rightarrow$ Rel. Strength equal	7 : 1	589.7	298	30.5	18	28.86	significant
Model 8	Model 6 + P6 Satisfaction $\rightarrow$ Rel. Strength equal	8 : 1	587.2	298	28	18	28.86	ns
Model 9	Model 8 + P7 Trust $\rightarrow$ Attitudinal Loyalty equal	9 : 1	579.4	298	20.2	18	28.86	ns
Model 10	Model 9 + P8 Satisfaction $\rightarrow$ Behavioural Loyalty equal	10 : 1	582.2	299	23	19	30.14	ns
Model 11	Model 10 + P9 Rel. Strength $\rightarrow$ Attitudinal Loyalty equal	11 : 1	582.2	300	23	20	31.41	ns
Model 12	Model 11 + P10 Attitudinal Loyalty $\rightarrow$ Behavioural Loyalty equal	12 : 1	590.8	302	31.6	22	33.92	ns
Model 13	Model 12 + P11 Satisfaction $\rightarrow$ Attitudinal Loyalty equal	13 : 1	591.5	303	32.3	23	35.17	ns
Model 14	Model 13 + E12 (e-rs8 $\leftrightarrow$ e-rs9) equal	14 : 1	591.5	304	32.3	24	36.41	ns

Table 6.24 MGIT – goodness of fit statistics for market contexts

Model	Model description	AIC	BCC	CFI	RMSEA	SRMR
Model 1	Unconstrained baseline model	759.71	774.52	0.966	0.042	0.043
Model 2	All factor loadings constrained equal	742.11	755.47	0.966	0.042	0.042
Model 3	Model 2 + P1 Co-creation → Satisfaction constrained equal	750.04	763.24	0.965	0.041	0.047
Model 4	Model 3 + P2 Co-creation → Trust constrained equal	748.47	761.53	0.965	0.041	0.047
Model 5	Model 4 + P3 Co-creation → Rel. Strength constrained equal	753.12	766.02	0.965	0.042	0.048
Model 6	Model 5 + P4 Satisfaction → Trust constrained equal	751.21	763.96	0.965	0.042	0.047
Model 7	Model 6 + P5 Trust → Rel. Strength constrained equal	753.66	766.26	0.964	0.042	0.049
Model 8	Model 6 + P6 Satisfaction → Rel. Strength constrained equal	751.21	763.8	0.965	0.041	0.049
Model 9	Model 8 + P7 Trust → Attitudinal Loyalty constrained equal	743.42	756.01	0.966	0.041	0.046
Model 10	Model 9 + P8 Satisfaction → Behavioural Loyalty constrained equal	744.15	756.59	0.965	0.041	0.046
Model 11	Model 10 + P9 Rel. Strength → Attitudinal Loyalty constrained equal	742.16	754.44	0.966	0.041	0.046
Model 12	Model 11 + P10 Attitudinal Loyalty → Behavioural Loyalty constrained equal	746.84	758.82	0.965	0.041	0.05
Model 13	Model 12 + P11 Satisfaction → Attitudinal Loyalty constrained equal	745.15	756.97	0.965	0.041	0.052
Model 14	Model 13 + E12 (e-rs8 ↔ e-rs9) constrained equal	743.45	755.14	0.965	0.041	0.051

#### 6.7.4 MGIT procedure for product and service co-creation contexts

This follows the same pattern as the previous analysis. Row 1 in Table 6.25 shows that the global structural model has good fit in comparison to the goodness of fitness thresholds in Table 6.15. Single group analysis of the product and service contexts structural path models as shown in Table 6.25 indicate acceptable goodness of fit statistic in line with the goodness of fit thresholds in Table 6.15. The Normed Chi-square, GFI, AGFI, SRMR, RMSEA, TLI, and CFI statistics are all within threshold limits for both the product and service contexts. The AIC and BCC fit statistics point to good fit for both the product and service structural models.

Table 6.26 shows the standardised regression estimates for the single groups' models between the product and service contexts. The differences in the regression path estimates suggest differences between the product and service contexts. Specifically, the Trust to Relationship Strength, Co-creation to Relationship Strength, Trust to Attitudinal Loyalty, Relationship Strength to Attitudinal Loyalty, Satisfaction to Attitudinal Loyalty, Attitudinal Loyalty and Satisfaction to Behavioural Loyalty paths suggest difference in regression estimates in single groups analysis in Table 6.26.

Tables 6.27 and 6.28 present the results for the MGIT for the product and service co-creation contexts. Overall the results in Table 6.27 point to differences for Trust to attitudinal Loyalty, Satisfaction to Behavioural Loyalty, Relationship Strength to Attitudinal Loyalty and Attitudinal Loyalty to Behavioural Loyalty paths. In summary, multi-groups invariance analysis for the product and service contexts shows a moderate degree of variance in some structural paths for the product and service co-creation contexts.

Table 6.25 Single group's analysis for product and services contexts

Model	Cmin/df	GFI	AGFI	SRMR	RMSEA	TLI	CFI	AIC	BCC
Global Model N = 563	2.417	0.938	0.916	0.031	0.05	0.975	0.975	438.43	442.12
Product context N = 277	2.251	0.90	0.864	0.04	0.67	0.946	0.956	415.07	422.89
Services Context N = 286	1.952	0.90	0.869	0.04	0.058	0.963	0.969	373.27	380.81

Table 6.26 Single group's regression estimates for product and services

Parameters	Product Context Structural Model Estimates N = 277			Services Context Structural Model Estimates N = 286			Global Structural Model Estimates N = 563		
	Standard estimates	<i>t-values</i>		Standard estimates	<i>t-values</i>		Standard estimates	<i>t-values</i>	
Co-creation → Satisfaction	0.83	12.3		0.83	12.49		0.82	16.82	
Co-creation → Trust	0.10	-0.91	NS	0.04	-0.40	NS	-0.10	-1.27	NS
Satisfaction → Trust	0.96	7.27		0.85	7.36		0.93	11.29	
Trust → Relationship Strength	0.46	2.79		0.54	5.02		0.48	5.00	
Satisfaction → Relationship Strength	0.25	1.58	NS	0.07	0.46	NS	0.14	1.12	NS
Co-creation → Relationship Strength	0.06	0.15	NS	0.24	2.43		0.17	2.30	
Trust → Attitudinal Loyalty	0.49	3.59		0.06	-0.67	NS	0.19	2.53	
Relationship Strength → Attitudinal Loyalty	0.44	6.05		0.88	9.59		0.65	11.38	
Satisfaction → Attitudinal Loyalty	0.09	0.71	NS	0.16	2.05		0.15	2.19	
Attitudinal Loyalty → Behavioural Loyalty	0.47	5.35		0.23	3.95		0.30	6.17	
Satisfaction → Behavioural Loyalty	0.50	5.71		0.79	12.16		0.69	12.85	

Table 6.27 MGIT comparing  $\chi^2$  differences for product and services contexts

Model	Model Description	Comparative Model	$\chi^2$	d/f	$\Delta\chi^2$	$\Delta d/f$	Critical value cut off @ (0.05) level	Statistical significance
Model 1	Unconstrained Baseline Model		588.3	280	-	-	-	-
Model 2	All factor loadings equal	2 : 1	613.6	293	25.3	13	22.6	sig
Model 3	All factor loading w/o Trust equal	3 : 1	594.2	291	5.9	11	19.67	ns
Model 4	Model 3 + Trust 2 equal	4 : 1	612.5	292	24.2	12	21.02	significant
Model 5	Model 3 + Trust 3 equal	5 : 1	606.7	292	18.4	12	21.02	ns
Model 6	Model 5 + P1 (Co-creation → Satisfaction) equal	6 : 1	608.1	293	19.8	13	22.36	ns
Model 7	Model 6 + P2 (Co-creation → Trust) equal	7 : 1	608.3	294	20	14	23.68	ns
Model 8	Model 7 + P3 (Co-creation → Relationship Strength) equal	8 : 1	609.4	295	21.1	15	24.99	ns
Model 9	Model 8 + P4 (Satisfaction → Trust) equal	9 : 1	611.9	296	23.6	16	26.29	ns
Model 10	Model 9 + P5 (Trust → Relationship Strength) equal	10 : 1	612.0	297	23.7	17	27.58	ns
Model 11	Model 10 + P6 (Satisfaction → Relationship Strength) equal	11 : 1	612.2	298	23.9	18	28.86	ns
Model 12	Model 11 + P7 (Trust → Attitudinal Loyalty) equal	12 : 1	628.8	299	38.5	19	30.14	significant
Model 13	Model 11 + P8 (Satisfaction → Behavioural Loyalty) equal	13 : 1	622.9	299	34.6	19	30.14	significant
Model 14	Model 11 + P9 (Relationship Strength → Attitudinal Loyalty) equal	14 : 1	640.7	299	52.4	19	31.14	significant
Model 15	Model 11 + P10 (Attitudinal Loyalty → Behavioural Loyalty) equal	15 : 1	622.5	299	34.2	19	30.14	significant
Model 16	Model 11 + P11 (Satisfaction → Attitudinal Loyalty) equal	16 : 1	612.7	299	24.4	19	30.14	ns
Model 17	Model 16 + E12 (e-rs8 ↔ e-rs9) equal	17 : 1	619.5	300	31.2	20	31.41	ns



Table 6.28 MGIT – goodness of fit statistics for product and services contexts

Model	Model Description	AIC	BCC	CFI	RMSEA	SRMR
Model 1	Unconstrained Baseline Model	788.35	803.71	0.963	0.044	0.039
Model 2	All factor loadings equal	787.57	800.93	0.961	0.044	0.045
Model 3	All factor loading w/o Trust equal	772.22	785.89	0.964	0.043	0.040
Model 4	Model 3 + Trust 2 equal	788.54	802.06	0.961	0.044	0.044
Model 5	Model 3 + Trust 3 equal	782.67	796.19	0.962	0.044	0.043
Model 6	Model 5 + P1 (Co-creation → Satisfaction) equal	782.06	795.42	0.962	0.044	0.044
Model 7	Model 6 + P2 (Co-creation → Trust ) equal	780.32	793.52	0.962	0.044	0.044
Model 8	Model 7 + P3 (Co-creation → Relationship Strength) equal	779.43	792.49	0.962	0.044	0.044
Model 9	Model 8 + P4 (Satisfaction → Trust) equal	779.91	792.81	0.962	0.044	0.047
Model 10	Model 9 + P5 (Trust → Relationship Strength) equal	778.04	790.79	0.962	0.043	0.047
Model 11	Model 10 + P6 (Satisfaction → Relationship Strength) equal	776.18	788.77	0.962	0.043	0.046
Model 12	Model 11 + P7 (Trust → Attitudinal Loyalty) equal	788.85	801.29	0.961	0.044	0.047
Model 13	Model 11 + P8 (Satisfaction → Behavioural Loyalty) equal	784.87	797.31	0.961	0.044	0.047
Model 14	Model 11 + P9 (Relationship Strength → Attitudinal Loyalty) equal	802.65	815.09	0.959	0.045	0.047
Model 15	Model 11 + P10 (Attitudinal Loyalty → Behavioural Loyalty) equal	784.52	796.96	0.961	0.044	0.048
Model 16	Model 11 + P11 (Satisfaction → Attitudinal Loyalty) equal	774.65	787.10	0.962	0.043	0.046
Model 17	Model 16 + E12 (e-rs8 ↔ e-rs9) equal	779.49	791.78	0.962	0.044	0.046

## 6.8 Linking findings to research hypotheses

Figure 6.5 and Table 6.29 shows that of the 11 path hypotheses for the study's structural model all but two, H2 and H6, have significant direct path coefficients and are thus accepted. Although the direct path between co-creation and trust is not significant, the indirect path from co-creation to satisfaction and from satisfaction to trust shows a positive indirect regression estimate of 0.76. Thus, this means that there is a positive indirect relationship between co-creation and trust constructs. Likewise, the indirect path estimate for the H6 hypothesis shows a positive regression estimate of 0.44, which shows an indirect relationship between the satisfaction and relationship strength constructs. Therefore, the positive indirect path estimates means that both the H2 and H6 hypotheses are also accepted. Hypotheses 12 and 13 test for invariance of the structural paths in the B2B / B2C market contexts and product and service co-creation contexts. The results of the invariance testing points to acceptance of Hypothesis 12, as the results of the invariance testing for the B2B / B2C contexts show all structural paths, but one are invariant. The results for the invariance analysis for the product and services context show all, but four paths are invariant, hence this presents an indication of a moderate degree of differences in the structural paths for the product-service co-creation contexts. The moderate degree of differences in the structural model means that H13 which supports the hypotheses that co-creation's influence on marketing outcomes is invariant across product and services contexts is not met, and hence hypothesis 13 is not accepted.

Figure 6.5 Research hypotheses

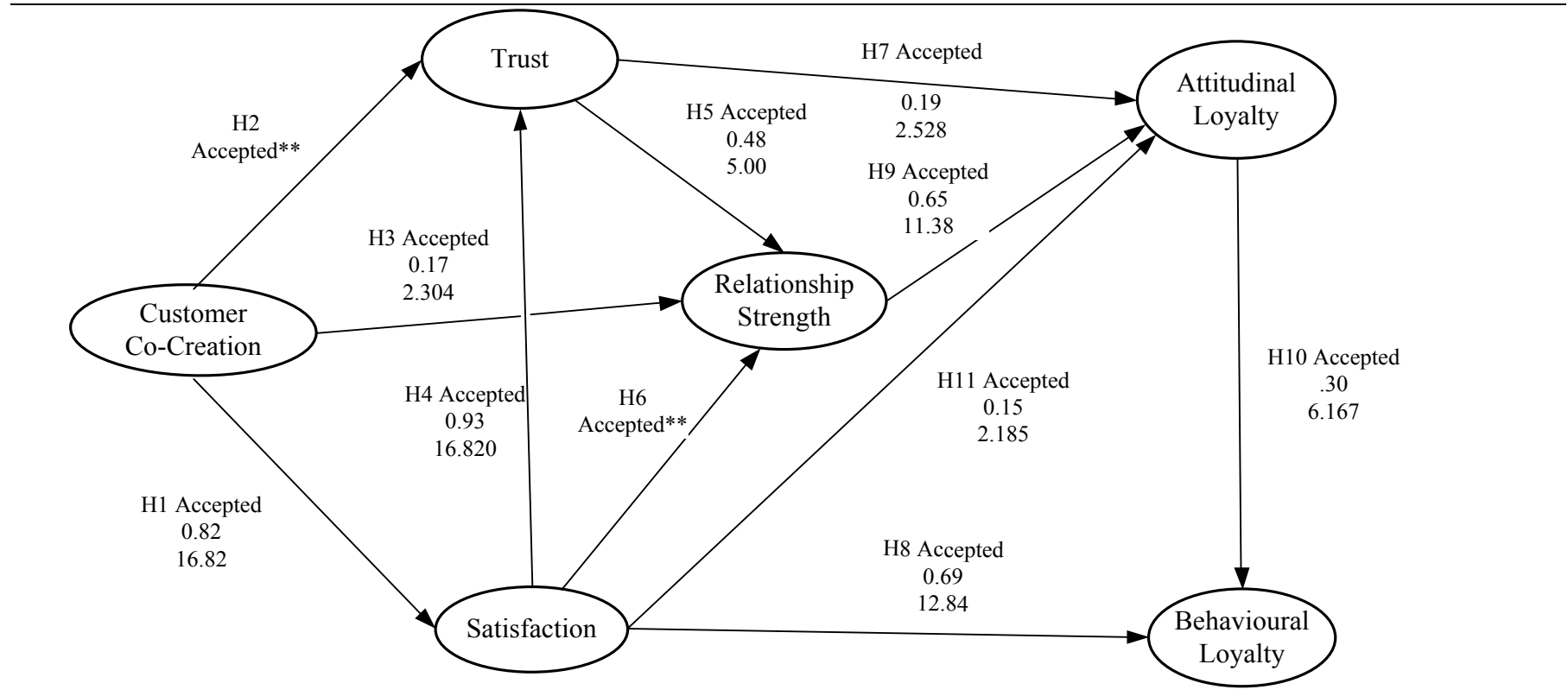


Table 6.29 Research hypotheses, parameter estimates and t-values

	Hypotheses	Results	Standardised estimate	t-value	Significance level
H1	Higher levels of co-creation influences buyer's satisfaction positively	Accepted	0.822	16.820	$p \leq 0.01$
H2	Higher levels of co-creation influences buyer's trust positively	<b>Accepted**</b>	-0.092	-1.270	NS
H3	Higher levels of co-creation influences relationships strength positively	Accepted	0.172	2.304	$p \leq 0.05$
H4	Buyer's satisfaction influences trust positively	Accepted	0.926	11.291	$p \leq 0.01$
H5	Trust in the seller influences relationship strength positively	Accepted	0.484	5.000	$p \leq 0.01$
H6	Buyer's satisfaction with the seller influences relationship strength positively	<b>Accepted**</b>	0.143	1.124	NS
H7	Buyer's trust in seller positively influences attitudinal loyalty positively	Accepted	0.192	2.528	$p \leq 0.05$
H8	Buyer's satisfaction influences behavioural loyalty positively	Accepted	0.690	12.849	$p \leq 0.01$
H9	Relationship strength between buyer and seller influence attitudinal loyalty positively	Accepted	0.653	11.388	$p \leq 0.01$
H10	Buyer's attitudinal loyalty generates positive behavioural loyalty	Accepted	0.301	6.167	$p \leq 0.05$
H11	Buyer's satisfaction with the seller influences attitudinal loyalty positively	Accepted	0.151	2.185	$p \leq 0.05$
H12	Co-creation influence on marketing outcomes is invariant across the B2B and B2C market contexts	Accepted	Type of market contexts generally shows invariance in the structural paths		
H13	Co-creation influence on marketing outcomes is invariant across the product and service contexts	Rejected	Moderate degree of invariance between the product and service contexts in the structural paths		
Note	<b>** Although the direct paths for the H2 and H6 paths are not significant, the indirect path estimates for both the H2 and H6 hypotheses are positive, hence both these hypotheses are accepted.</b>				

## 6.9 Chapter conclusions

Chapter 6 sets out the detailed the analysis and findings for the main study.

Chapter 7 discusses the findings, theoretical and conceptual rationale for these findings.

In addition, the next chapter discusses the contributions of this study for marketing theory and managerial practice, and, highlights the opportunities for future research.

## CHAPTER 7: DISCUSSION OF RESULTS

Table 7.1 Chapter 7 outline

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7.0. Introduction
↓
7.1 Discussion
↓
7.2 Marketing theory contributions
↓
7.3 Implications for managerial practice
↓
7.4 Opportunities for further research
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7.5 Thesis conclusion

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### 7.0 Introduction

This chapter discusses the findings of the study, and identifies both theoretical and methodological contributions to marketing theory. These contributions in turn have implications of the study for future research studies to plug identified gaps and extend the research.

### 7.1 Discussion

#### 7.1.1 Measurement model

The overall results of the measurement model for the main study shows that the co-creation construct is closely associated with the marketing outcome constructs of satisfaction, trust, relationship strength, attitudinal and behavioural loyalty. The

empirical evidence of the main study thus supports the study's conceptual perspective, that co-creation has a clear effect on marketing outcome variables.

Empirical investigation of the co-creation construct is a relatively new area of research and, consequently, there are no reported measurement scales to operationalise the measurement of the construct. The scale developed for this study is an early contribution to the development of such a scale. This scale is developed from a synthesis of the literature, refined in the pilot study before testing in the main study. The empirical evidence shows that this co-creation measurement scale demonstrates strong evidence of reliability. Indeed, the clear separation between constructs in the research model presents general evidence of convergent and discriminant validity for the co-creation construct.

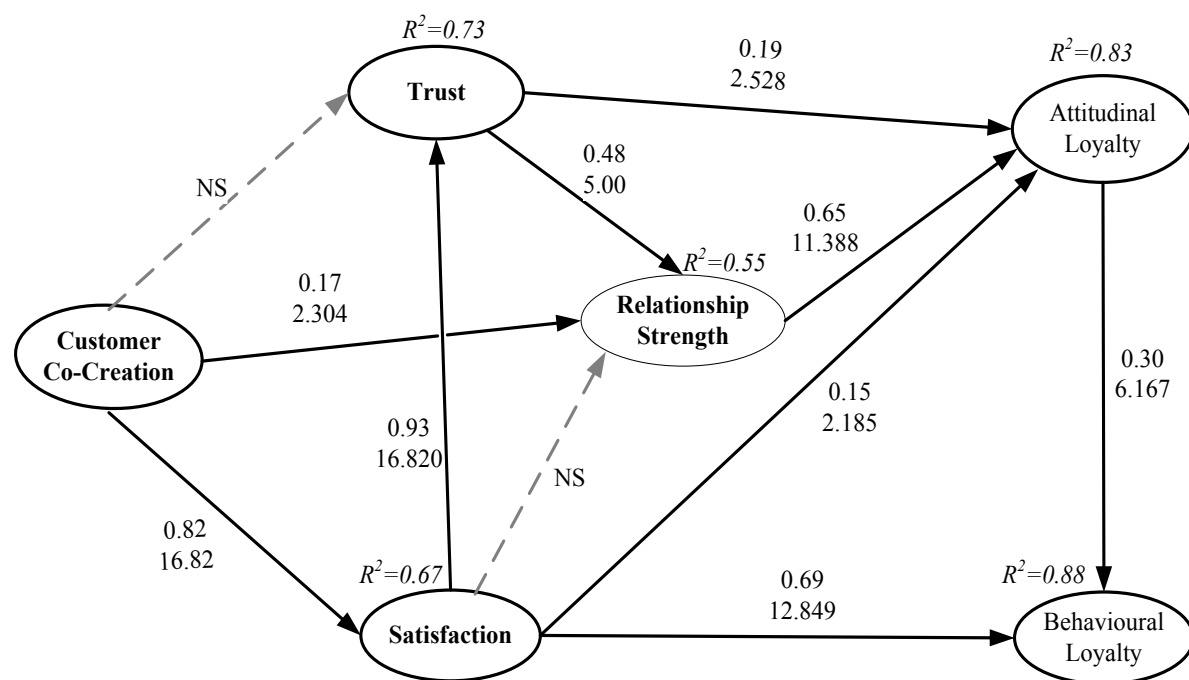
In the pilot study the attitudinal and behavioural loyalty measurement scale items did not separate clearly, and consequently these constructs were merged into a single customer loyalty construct. Improvements to the attitudinal and behavioural loyalty measurement scales in the main study present evidence of clear separation for these constructs. The measurement items for the relationship strength construct are similarly refined from the scale developed in the pilot study, and perform well in the main study. Satisfaction and trust are both measured by validated scales and the analysis shows the measurement scales for these construct do perform well, as they did in the pilot study.

#### 7.1.2 Structural model

Overall, the results in the structural model in the main study show that co-creation generates positive outcomes for the dependent constructs as conceptually hypothesised, and provides confirmatory support for the results in the pilot study. The structural model in Figure 7.1 shows the direct effect regression estimates for the paths in the

structural model. The ensuing discussion presents the empirical results and threads them into a theoretical rationale for the findings for each of the structural paths.

Figure 7.1 Structural paths with regression estimates for overall structural model



First, the high-regression estimate from co-creation to satisfaction shows that satisfaction is a strong outcome of co-creation. The result shows that joint problem solving through co-creation yields a highly satisfying buyer solution. This result is consistent to the earlier finding in the pilot study that satisfaction is a direct outcome of buyer-seller co-creation. The co-creation between the buyer and seller generates a buyer solution that evolves from the joint problem solving process between the buyer and seller; hence generating a focussed and unique customer solution (Prahalad & Ramaswamy, 2003). The focussed solution from buyer-seller co-creation generates high levels of satisfaction for the buyer (Mascarenhas et al., 2004). An additional rationale for higher levels of buyer satisfaction from co-creation is that the active buyer



participation generates self-serving bias, which creates an accentuating effect on buyer satisfaction levels. Self-serving bias theory explains that buyers who actively participate in the marketing exchange give themselves a greater proportion of the credit for the marketing outcome (Bendapudi & Leone, 2003). Hence, self-serving bias theory provides an additional theoretical explanation for the higher satisfaction levels arising directly from co-creation.

Second, the direct path from co-creation to relationship strength shows a positive outcome, albeit a weak to moderate regression estimate. This shows that the buyer and seller co-creation engenders relationship bonds between the buyer and seller. The joint problem solving requires interaction, dialogue, conversations and sharing of ideas serve to generate the buyer solution. The interactions between buyer and seller generate bonds and attachments between them contributing to the development of buyer-seller relationships. The SDL (Vargo & Lusch, 2004a) and service logic (Grönroos, 2008) perspectives suggest that co-creation is framed in a relational setting. Hence, the sharing of ideas, conversations (Lundkvist & Yaklef, 2004), active participation of the buyer (Mascarenhas et al., 2004), interactions (Ballantyne, 2004; Grönroos, 2008) in co-creation are conducive to the generation of relationship strength between buyer and seller.

Third, Figure 7.1 shows that while co-creation does not generate trust directly as an outcome of co-creation, trust arises indirectly from high levels of satisfaction. This is to say that satisfaction contributes directly to generating trust from co-creation. The conceptual evidence suggests that co-creation generates trust (Malaviya & Spargo, 2002; Mascarenhas et al., 2004). Trust between the buyer and seller reflects the reliability and ability of the seller to meet the obligations in the marketing exchange (Dwyer & Tanner, 2006; Morgan & Hunt, 1994). The results here suggest that buyer-seller co-creation generates highly satisfactory solutions which enable buyers to make

an assessment of the trustworthiness of the seller. Thus the perceived value from the buyer solution provides the means to assess trust in the seller (Johnson & Grayson, 2005). In this connection, the high levels of satisfaction contribute to generating strong level of trust in the seller. Thus, satisfaction construct is an antecedent variable to the trust construct.

There are assertions that co-creation generates more than just a functional tangible outcome (Mascarenhas et al., 2004; Sawhney, 2006; Tuli et al., 2007). Thus, the tangible offering from co-creation represents one part of the customer solution from co-creation. The notion of the tangible offering implies that intangible outcomes are also reflected in the customer solution from co-creation (Mascarenhas et al., 2004). Selnes (1998) states that trust is a relational outcome, so the generation of trust indirectly through satisfaction represents such an intangible outcome for the buyer. Thus buyer-seller co-creation incorporates both tangible and intangible outcomes into the customer solution (Mascarenhas et al., 2004). Studies on satisfaction and trust have shown positive association between these constructs before (Garbarino & Johnson, 1999; Ranaweera & Prabhu, 2003), however these studies did not map the causal direction of the path between satisfaction and trust. One early study (Selnes, 1998) suggests that satisfaction has an antecedent relationship to the trust construct, as do other more recent studies (Kassim & Abdullah, 2010; Kennedy et al., 2001; Ulaga & Eggert, 2006).

Fourth, Figure 7.1 further shows that Trust contributes to the Relationship Strength construct. While the direct path from Co-creation to Relationship Strength does show the development of some degree of relationship strength between buyer and seller, trust further contributes to enhancing the relationship strength between buyer and seller. The high level of trust arising indirectly through satisfaction suggests that the buyer has a positive view of the seller's reliability and ability to deliver buyer solutions. This positive evaluation of the seller as perceived by the buyer translates to enhancing

relationship strength (Gronroos, 1994). The conceptual literature provides support for the evidence here that the perception of trustworthiness of the seller arising from the interactions, dialogue and tangible solution from co-creation serves to deepen and strengthen buyer-seller relationships (Malaviya & Spargo, 2002; Mascarenhas et al., 2004). Johnson et. al.,(2005) also suggest that trust contributes to facilitating buyer-seller relationships.

Fifth, Figure 7.1 shows that attitudinal loyalty is an outcome of the satisfaction, trust and relationship strength constructs. Attitudinal loyalty is defined as a positive psychological disposition of the buyer toward the seller (Dick & Basu, 1994). Figure 7.1 shows that satisfaction contributes directly to generating attitudinal loyalty, however the regression estimate for this path is only weakly positive, which implies that the direct influence of satisfaction on attitudinal loyalty is relatively weak. The link between satisfaction and attitudinal loyalty is less well-documented, as most early studies on customer loyalty addressed this issue as a single, composite, loyalty construct. However, Oliver's study on satisfaction (1980) did point to a positive link between satisfaction and attitudinal loyalty. The study of customer loyalty as two separate constructs gained momentum after Dick & Basu's (1994) conceptual article suggesting that measuring attitudinal and behavioural loyalty separately is a more precise means to measuring the effect of customer loyalty. Since then a number of studies have shown evidence that satisfaction does in fact contribute to enhancing attitudinal loyalty (Bodet, 2008; Shankar et al., 2003). Thus, this research presents corroborating support that that satisfaction does contribute to generating positive attitudinal loyalty as prior authors have conjectured.

Sixth, Figure 7.1 also shows that attitudinal loyalty is an outcome of both the trust and relationship strength constructs. The relationship marketing literature supports the idea that trust, buyer-relationships, customer loyalty are all complementary relational

constructs (Evanschitzky et al., 2006; Sirdeshmukh et al., 2002). Hence, the relational link allows for the inference that trust and relationship constructs contribute to enhancing attitudinal loyalty in the research model. In terms of the causal pathway, there is evidence to show that buyer-seller relationships precede attitudinal loyalty (Bove & Johnson, 2001; Evanschitzky et al., 2006; Hausman, 2001), which provides support for the contention that relationship strength enhances attitudinal loyalty in this study. Using the same line of reasoning, evidence is furnished to show that trust also contributes directly to attitudinal loyalty (Chaudhuri & Holbrook, 2001; DeWitt et al., 2008), hence this evidence provides support for the direct path between trust and attitudinal loyalty in the research model in Figure 7.1.

Seventh, the findings in the main study show that co-creation generates behavioural loyalty through satisfaction, which means that the high levels of satisfaction generates strong momentum for the buyer to repurchase from the seller. The strong regression estimates for this path attests that satisfaction is strong driver of behavioural loyalty. It is well acknowledged that that satisfaction generates customer retention (Garbarino & Johnson, 1999; Ranaweera & Prabhu, 2003; Selnes, 1998). Thus these provide a rationale for a data driven inference that satisfaction exerts a strong influence on behavioural loyalty.

The final structural path discussed shows that attitudinal loyalty contributes to strengthening behavioural loyalty. Attitudinal loyalty's influence on behavioural loyalty is moderately strong, as the regression estimates show in Figure 7.1 show. Dick and Basu (1994) first suggested that greater precision is derived if customer loyalty is measured as individual constructs of attitudinal and behavioural loyalty. However, the study of customer loyalty as separate constructs has shown mixed results (East, Gendall, Hammond, & Lomax, 2005; Garland & Gendall, 2004). Another example to this effect is the pilot study where the loyalty measures did not offer clear discrimination for

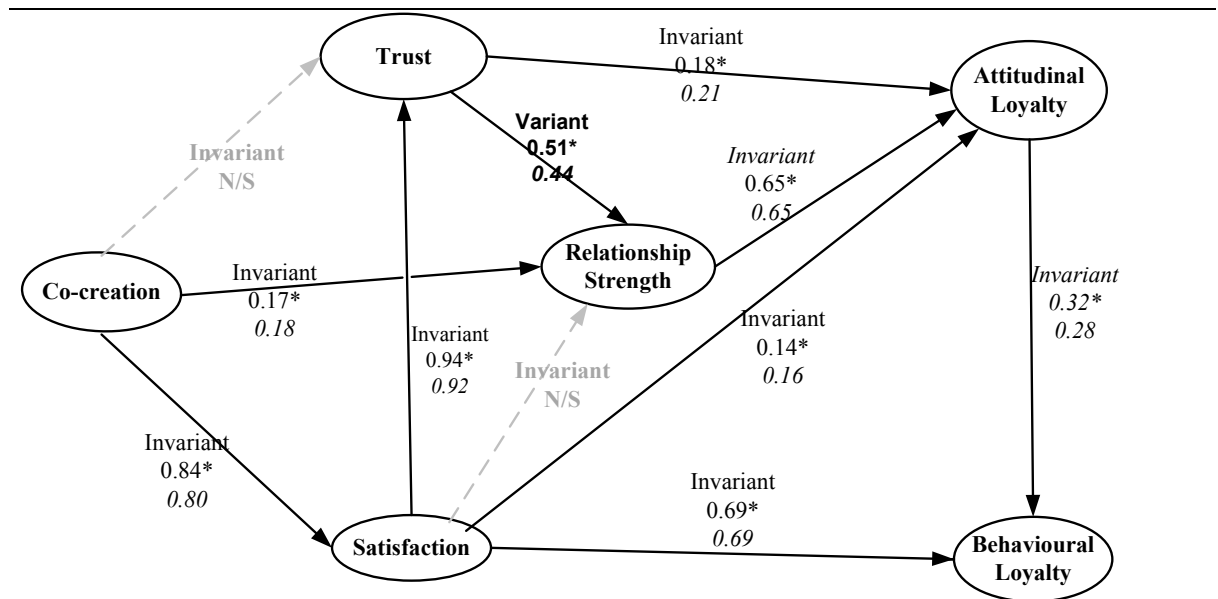
modelling into separate constructs of attitudinal and behavioural loyalty. One explanation for the lack of separation is that the measurement scales for each of the attitudinal and behavioural loyalty constructs are not tapping satisfactorily into the domain of the construct (Rundle-Thiele, 2005). To overcome this difficulty, it is imperative that the measurement scale draws precisely on the domain for each these constructs. The results from the main study present clear evidence that the attitudinal and behavioural loyalty constructs are separate. The evidence of construct discrimination lends support to the view that the definition of the domain and selection of measurement scales contribute to convergent and discriminant validity for the constructs.

The overall assessment of the structural model shows all the dependent constructs in the research model presenting strong associations between co-creation and the dependent constructs as reflected by the squared multiple correlation scores ( $R^2$ ) in Figure 7.1. This strong evidence is indicative that co-creation is closely related to the nomological net of constructs in the research model in this study.

### 7.1.3 Comparing B2B and B2C market contexts

Recently researchers have claimed that customers in B2C markets are becoming empowered, better informed and more willing to actively participate in the marketing exchange process, suggesting that B2C market are starting to show similarities with B2B market contexts (Niininen et al., 2007; Ouschan et al., 2006; Wikstrom, 1996a). Other researchers have lamented that (Hoyer et al., 2010) that there is little research on the link between co-creation and its outcomes in the B2C market context. A direct comparison of these market contexts will thus contribute to filling an identified gap in the marketing literature.

Figure 7.2 MGIA structural estimates for B2B & B2C market contexts



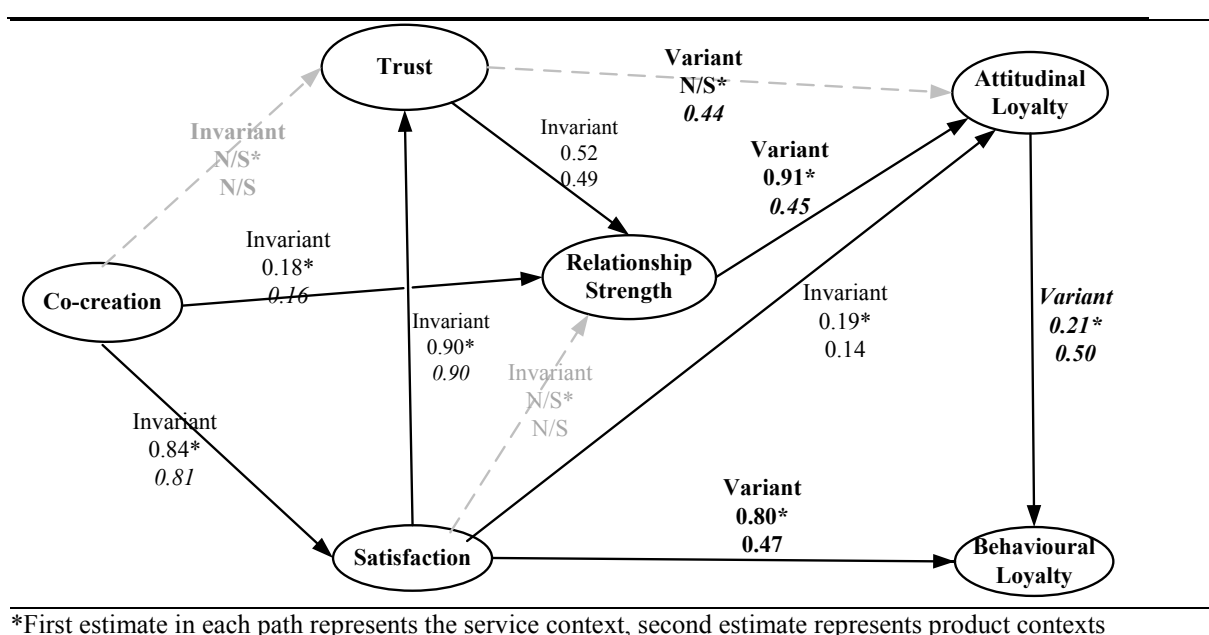
\*First estimate in each path represents the B2B context, second estimate represents B2C contexts

The results of multi-group invariance analysis in the SEM procedure show that co-creation does generate similar marketing outcomes in both B2B and B2C market contexts. Figure 7.2 shows that all structural paths but one are invariant across the B2B and B2C market contexts. The single variant path is the Trust to Relationship Strength path where this path is relatively stronger for the B2B market contexts. Thus, the

results of this study present empirical support for the thought expressed by, *inter alia*, Coviello and Brodie (Coviello & Brodie, 2001) that the outcomes of co-creation are broadly similar for B2B and B2C market contexts which coincide with the perspective that the differences between B2B and B2C market contexts are overstated and that B2B and B2C market contexts are more similar than earlier thought.

#### 7.1.4 Comparing product and service contexts

Figure 7.3 MGIA structural estimates for service & product co-creation



While the B2B and B2C market co-creation contexts do not present differences in marketing outcomes from co-creation, the product and service co-creation contexts do show interesting differences in marketing outcomes for a number of the structural paths in the multi-group invariance analysis, as shown in shown in Figure 7.3 & Table 7.2

Table 7.2 Regression path estimates for product & service co-creation

Structural paths	Service co-creation	Product co-creation
Satisfaction → Behavioural Loyalty	0.80	0.47
Trust → Attitudinal Loyalty	N/S	0.44
Relationship Strength → Attitudinal Loyalty	0.91	0.45
Attitudinal Loyalty → Behavioural Loyalty	0.21	0.50

The MGIT results in Table 7.2 show that the satisfaction to behavioural loyalty structural path is stronger for services co-creation than for product co-creation. One rationale for the stronger behavioural loyalty in services is that the higher levels of intangibility in service co-creation means a higher degree of perceived risk compared to tangible product marketing (Laroche, Bergeron, & Goutaland, 2003; Laroche, McDougall, Bergeron, & Yang, 2004; Murray & Schlacter, 1990). The reason for a relatively higher perceived risk in a service co-creation is that a buyer is not able to evaluate the outcomes of the service exchange prior to committing to the marketing exchange. Therefore, when a buyer locates a service provider who provides a highly satisfying service co-creation experience, the buyer is more likely to re-purchase from the same service provider.

While the buyer may experience high levels of satisfaction from product co-creation with the incumbent seller, the possibility of ‘test driving’ (Edvardsson et al., 2005) rival competitor product offerings without experiencing a high degree of perceived risk before committing to the seller, means that customer may not necessarily return to the incumbent seller for future co-creation exchanges. The underlying higher level of perceived risk in service co-creation provides a theoretical rationale for a



stronger propensity towards behavioural loyalty for services co-creation as compared to product co-creation.

The standardised regression estimates in Table 7.2 show strong levels of relational outcome for both product and services co-creation, but the strength of the three structural paths differs for product and services co-creation. For service co-creation, relationship strength contributes directly to attitudinal loyalty, while for product co-creation, trust contributes directly to attitudinal loyalty, as well as indirectly through relationship strength to generate attitudinal loyalty. In particular, these results reinforce the view that relationships are vital for service co-creation, and relationships between the buyer and seller lead the way to positive attitudinal and behavioural loyalty. The intangible nature of a service means that the relatively higher perceived risk (Laroche et al., 2003) requires strong relational bonds between the buyer-seller for service co-creation (Gwinner, Gremler, & Bitner, 1998). The strong bonds between the buyer and seller in turn contribute to positive attitudinal loyalty, as shown in Figure 7.3

For product co-creation, attitudinal loyalty arises in two circumstances. First, the strong trust levels, arising through the buyer's direct interaction with the tangible co-created product offering, directly contributes to enhancing attitudinal loyalty. For example, the levels of trust through the buyers direct interaction with the physical co-created offering or brand directly enhances attitudinal loyalty (Gummesson, 2008). Second, the interactions between buyer and seller generate strong levels of relationship strength which in-turn contributes to enhancing attitudinal loyalty. Thus, attitudinal loyalty for product co-creation arises directly from trust and indirectly through relationship strength construct.

The final difference in the structural paths shows that attitudinal loyalty contributes directly to the behavioural loyalty path for both product and service co-

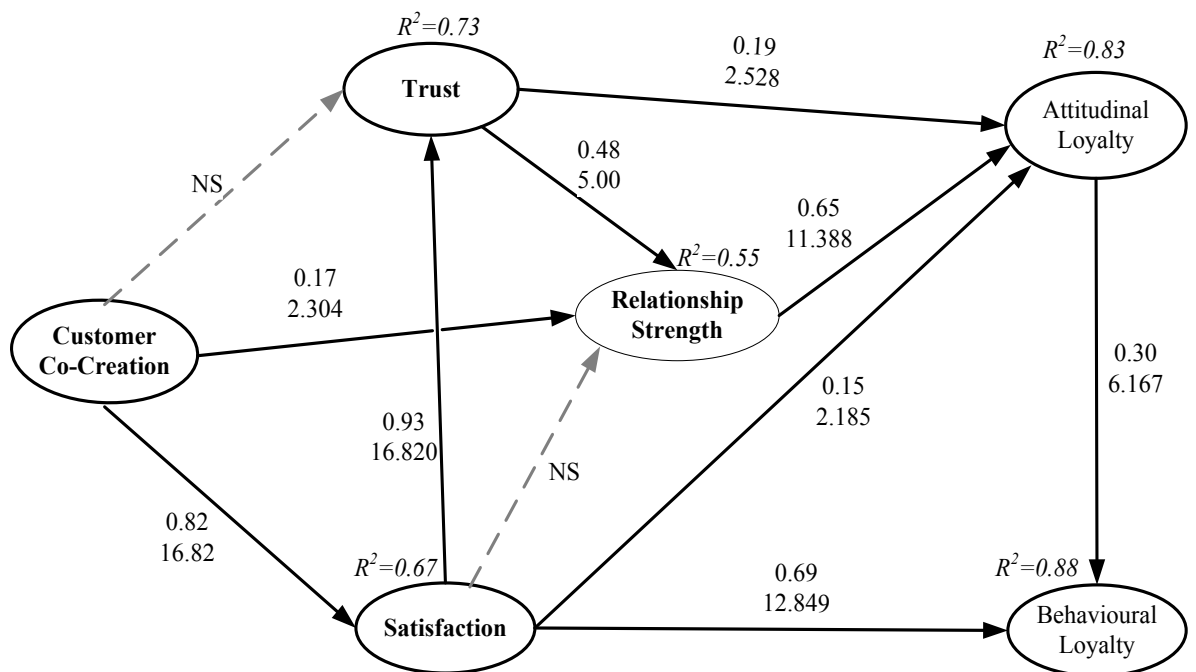
creation, however the regression estimates appears stronger for product co-creation and only moderately strong for service co-creation.

To summarise, co-creation generates positive and very similar outcomes for both B2B and B2C, and for both service and product co-creation. However some of the structural paths show interesting but logical differences in the services versus product situation

### 7.1.5 Post-hoc analysis of structural model

The discussion in the previous section of this chapter focuses on the empirical findings as they relate to the theoretical relationships hypothesised in the study. This section briefly presents two aspects of the research which are of great interest and provide direction for future research opportunities, but are outside the original scope of the thesis.

Figure 7.4 Post-hoc analyses - identifying transactional and relational co-creation



#### *Co-creation in transactional and relational situations*

An examination of the path structure in Figure 7.4, reproduced above, suggests that co-creation could potentially arise in the form of both transactional and relational co-creation. First, consider transactional co-creation. In Figure 7.4, transactional co-

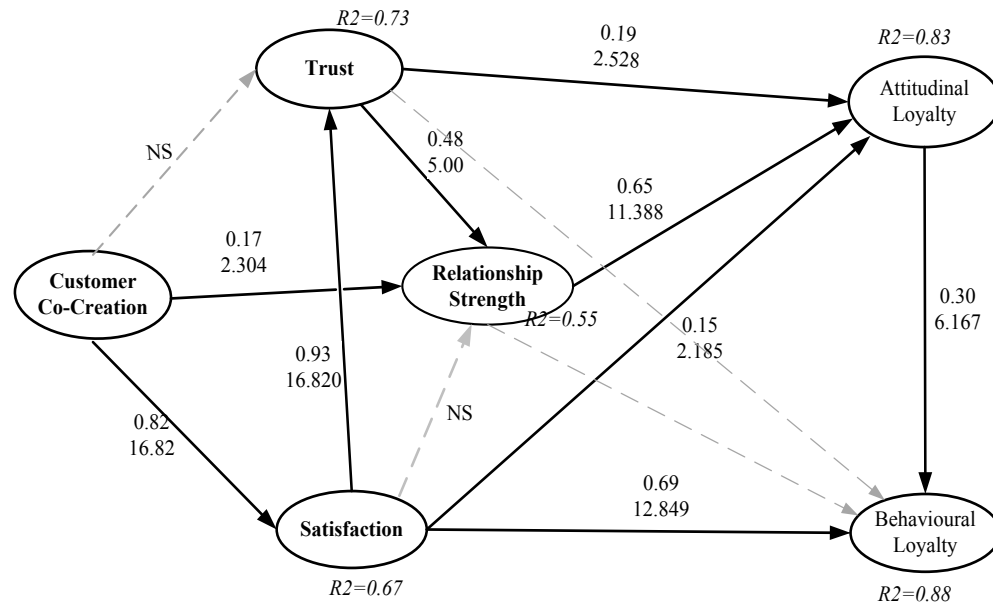
creation may be seen to occur when co-creation generates a high level of satisfaction which, in turn, contributes to strong repurchase behaviour. The direct impact of satisfaction appears to fall mainly upon behavioural rather than attitudinal loyalty, with no direct affect upon relationship strength. This is highly suggestive of a transactional exchange, with co-creation contributing to satisfaction and thus supporting repurchase.

The relational path is more obvious, and also follows from the positive impact of co-creation upon satisfaction. The causal route in this instance flows through Trust and Relationship strength to Attitudinal loyalty.

While the SDL perspective has framed co-creation in a relational context (Vargo & Lusch, 2004a) , post-hoc analysis of the structural model in this study suggests that co-creation may also arise in a discrete transactional context. Other studies on transactional and relational marketing also suggest that these marketing typologies are not mutually exclusive, rather they co-exist side by side (Sharma & Pillai, 2003; Styles & Ambler, 2003) . Garbarino et. al's. (1999) study finds that the marketing outcomes for relational and transactional oriented customers differ in terms of yielding different patterns of marketing outcomes.

However, as noted previously, the research reported here was not designed to test this aspect of co-creation, and so the interpretation of alternative paths for relational and non-relational transactions being made here are speculative. There is little doubt, though, that a future research opportunity arises around the question of precisely how the pattern of outcomes of co-creation differ for transactional- and relational-oriented buyers.

Figure 7.5 Post-hoc analyses of structural paths



While the structural paths in the research model were tested as hypothesised, *post hoc* analyses is carried out on two other structural paths that did not form part of the hypotheses for the study. The first is the path from the Trust construct to the Behavioural Loyalty construct shown in Figure 7.5. The structural results show that this path is not significant. The second path tested is the path from Relationship Strength to Behavioural Loyalty, and again the results show the path is not significant as shown in Figure 7.5. That these paths are not significant strengthens the confidence in the research model, and supports the postulated relationships among the constructs.

## 7.2 Marketing theory contributions

The research identifies both major and subsidiary contributions for marketing theory

### 7.2.1 Major contributions

#### *Co-creation and marketing outcomes*

Recent literature has reiterated the need for more empirical studies on the outcomes of co-creation (Hoyer et al., 2010). The 2010-2012 Marketing Science Institute highlights co-creation as a priority research issue, yet currently there are only a limited number of empirical articles on co-creation and its outcomes. In addition, the existing studies on co-creation and its outcomes have focussed on a narrow range of marketing outcomes. For example, studies have investigated the influence of co-creation, satisfaction and repurchase intentions (Dong et al., 2008), and co-creation, attitudinal loyalty and behavioural loyalty, customer participation and satisfaction (Bendapudi & Leone, 2003; Kellog et al., 1997).

Furthermore, the conceptual literature suggests that co-creation generates high levels of trust and aligns within a buyer-seller relational context (Malaviya & Spargo, 2002; Mascarenhas et al., 2004; Vargo & Lusch, 2004b). However, until now, there have been no reported empirical studies examining these associations.

Thus, this study distinguishes itself from others in that it probes the outcomes of co-creation in the context of a wider, more inclusive research model. The model of co-creation incorporates relationships between co-creation and trust, and co-creation and relationship strength; two relationships which have not been previously empirically investigated. The incorporation of a wider range of marketing outcome constructs in the research model thus extends both marketing knowledge and empirical evidence to

demonstrate a wider nomological net of marketing outcomes of co-creation. The overall empirical results in this study give strong support to the fundamental idea that co-creation generated does indeed have an impact upon marketing outcomes (Hoyer et al., 2010; Vargo & Lusch, 2004b).

#### *Effects of market contexts*

In general, co-creation exchanges are more established in B2B market contexts (Evans & Wolf, 2005; Hoyer et al., 2010) - conceptual articles and empirical research on co-creation tend to emphasise the examples of buyer-seller collaboration and joint problem-solving mainly in B2B market contexts rather than B2C market contexts (Bonney & Williams, 2009; Zhang & Chen, 2008). More recent perspectives suggest that buyers in B2C market contexts are becoming empowered (Niininen et al., 2007; Ouschan et al., 2006; Wikstrom, 1996a) and this empowerment is reducing the dominant role of the seller in the B2C market exchange contexts. The reduced dominance of the seller in B2C market contexts means a more even buyer-seller relationship is emerging in B2C market contexts more similar to the existing B2B market situation (Wikstrom, 1996a). Hence, there are calls being made for more research to assess if the marketing outcomes of co-creation in B2C market contexts are similar to those in B2B market contexts (Hoyer et al., 2010). The overall results in this study show that co-creation creates similar types and strength of customer outcomes for B2C and B2B market contexts. These results provide corroborating evidence to uphold the perspective that the differences in B2B and B2C markets are over-emphasised and, it may well be that B2B and B2C market have a lot more common than otherwise thought (Coviello & Brodie, 2001).

### *Effects of product and service contexts*

Quite contrary to the traditional view, the SDL view (Vargo & Lusch, 2004a) suggest that marketers adopt a service orientation for the marketing of both tangible product and intangible service offerings. It takes the view that buyers purchase either tangible or intangible service offerings for the core service solutions to solve customer problems. Overall, the empirical results in this study support this contention, that co-creation contributes to the value outcomes of satisfaction, trust, strong buyer-seller relationships, attitudinal and behavioural loyalty for both tangible good and intangible service marketing offerings. However, there does seem to be some degree of variation in the strength of the marketing outcomes for goods and services offerings. The results of this study thus contribute to the ongoing debate in marketing by demonstrating empirically that co-creation generates positive outcomes albeit with a moderate degree of variations in the strength of the outcomes between tangible product and intangible service offerings. These variations in the intensity of marketing outcomes provide a contribution to marketing knowledge, that the marketing of a tangible good or service offering requires appropriate adaptations to ensure that marketing outcomes are optimised in terms of downstream effects.

#### **7.2.2** Subsidiary contributions

##### *Operational definition of co-creation*

Co-creation appears to have different interpretations of its meaning among authors and researchers in the marketing literature. The different interpretations of co-creation mean that there is no single accepted definition in the literature, and this presents difficulty for operationalising the construct and measuring the construct. The operational definition of this study's perspective of co-creation is derived by



synthesising the literature and iteratively developing an operational definition in both stages of this study. The empirical validation presents a contribution to marketing theory.

#### *Co-creation measurement scale*

Subsequent to the conceptual development of a working definition of co-creation, a measurement scale for co-creation is developed for this study. To generate the scale, a review of the literature draws out key attributes of the construct, and a reflective measurement scale is then developed. The scale items are subjected to rigorous psychometric testing and development and reduced to four items that demonstrate strong validity and reliability. The co-creation scale thus demonstrates a useful reflection of the definition of co-creation adopted in the study.

#### *Positivist research design*

The study of co-creation reported in published marketing articles has focussed predominantly on the conceptual development of the construct (Jaworski & Kohli, 2006; Oliver, 2006; Payne et al., 2008; Vargo & Lusch, 2004b, 2007; Wikstrom, 1996a). Further, the empirical research investigating co-creation is almost entirely qualitative and uses interpretive methodologies (Boyle, 2007; Edvardsson et al., 2005; Jeppesen & Molin, 2003; Lundkvist & Yakklef, 2004; Mascarenhas et al., 2004; Ottensen et al., 2005; Ritson & Elliott, 1995; Rowley et al., 2007; Zerbini et al., 2007).

Hence, there is a scarcity of research on co-creation that adopts a positivist methodology. The literature does show some emerging of studies on co-creation adopting positivist methodology, however these are limited in number and this has presented an opportunity for more positivist research in this area. Examples of positivist research reported in the literature include those studies investigating the

influence of co-creation, satisfaction and repurchase intentions (Dong et al., 2008), co-creation, attitudinal loyalty and behavioural loyalty (Auh et al., 2007), and customer participation and satisfaction (Bendapudi & Leone, 2003; Kellog et al., 1997). This study contributes to marketing knowledge by adding significantly to the burgeoning but as yet limited body of positivist studies on co-creation

### *Importance of external resource*

The resource-based view (RBV) suggests that resources for value creation are possessed by business, and that these value creating resources reside internally with the supplier (Fahy, 2000). More recently other RBV scholars have voiced the thought that resources may also reside externally with the buyer (Jeppesen & Molin, 2003; Zander & Zander, 2005; Zerbini et al., 2007). Hence, co-creation enables a seller to incorporate a buyer's resources in terms of their co-creative inputs to contribute to value creation. The leveraging and pooling of resources possessed in parts by the buyer and seller contributes to the generation of a customer solution (Lundkvist & Yacklef, 2004; Zander & Zander, 2005). This study highlights the importance of a specific set of external resources, namely those possessed by the buyer in generating customer value in the marketing exchange, and the co-creation mechanism presents the conduit by which the external resources are accessed and drawn from one party by another to create value.

### 7.3 Implications for managerial practice

#### *Operationalising co-creation in the business process*

Co-creation generates a range of outcomes, and a good understanding of them provides managers with knowledge to better plan for the resource and marketing implication in implementing co-creation strategies in the business process. Again, the

results are supportive of the SDL work, and have similar implications for arranging the service aspects of goods markets to better allow buyers to participate jointly with the seller in reaching a mutually acceptable, and thus satisfying, solution to the buyer's problem

#### *Operationalising co-creation in B2B and B2C market contexts*

The operationalisation of co-creation, as it is defined in this study, shows that co-creation is equally applicable in B2B and B2C market contexts. While buyer-seller collaboration has in the main been identified in B2B markets, the results in this study does suggest that co-creation in B2C market contribute similar marketing outcomes for the buyer as in B2B market contexts. As buyers in B2C markets are becoming more empowered, this suggest that buyers in B2C markets may want greater levels of participation to generate the customer solution jointly with the supplier. Therefore B2C businesses whose target customers want greater levels of participation in value outcomes in the marketing exchange process, may consider threading co-creation strategies into the business process of the business to enhance value for the business. Whether this is attained through innovative use of technology, by retraining service and sales staff or through reorganisation of the selling function will depend on the specific market and competitive structure of the supplier company.

#### *Operationalising co-creation in product and service contexts*

The definition of co-creation adopted for co-creation in this study shows that co-creation strategies are employable for both tangible product and intangible service market offerings. While co-creation generates similar outcomes for both tangible product and intangible service offering, the strength of the outcomes varies.

For example in services co-creation, if a customer is highly satisfied with the outcome of the co-created marketing exchange, a buyer is more likely to display higher levels of behavioural loyalty in comparison to co-creation for a tangible product offering. The explanation for this is that the perceived risk is higher for services than tangible product offerings and therefore buyer who identifies a seller who can deliver a highly satisfying service is more likely to return to the seller for repeat marketing exchanges in the future. One assumption in this logic is that the service offering in is a generic service offering and a customer is not able to perceive differences between the services offerings of rival service providers. An example of a service offering is the purchase of telecommunication or energy services for a household. If the customer is highly satisfied with the supply of these services, the customer will continue to repurchase the services from the incumbent supplier as the perceived risk that something can go wrong when switching to alternative suppliers is high. Therefore a customer will display behavioural loyalty by staying with the incumbent service provider when the customer is highly satisfied with the services provided by the current supplier.

In the case of tangible good offerings, for example in purchasing offerings in convenience stores and grocery shopping, customers who are satisfied with the co-creation experience in the convenience or supermarket purchasing may also display high levels of behavioural loyalty. However the degree of behavioural loyalty towards the supplier is lower than for service offering as the perceived risk in purchasing similar tangible offerings from a rival supplier is less.

Some categories of service and tangible good offerings may require the generation of relational outcomes. For example, in high credence services such as medical, financial, accounting, tertiary education, travel services and personal care services, a high level of trust, strong relational buyer-seller bonds over and above high satisfaction

with the co-created service may be required to generate positive attitudinal and behavioural loyalty. Likewise, tangible goods offerings - such as the purchase of computers or large screen television sets - may also require high levels of trust and relational bonds between the buyer and seller to engender positive attitudinal and behavioural loyalty towards the supplier.

However, the levels of buyer-seller bonds may not need to be as high for a tangible product offering as compared to buyer seller bonds for services co-creation. The logic for this difference is that in the case of tangible good offering the customer interacts directly with the good (Gummesson, 2008) and the interactions with the good may compensate for a lower degree of buyer-seller bonding. Overall, this discussion indicates that co-creation for both service and product offerings offer value outcomes, but the strength of the outcomes may vary depending on whether it is a tangible or service offering. Hence, marketers who have an understanding of the differences can adapt their co-creation strategies more appropriately to the situation as they are in.

## 7.4 Opportunities for further research

### 7.4.1 Opportunities derived from research design limitations

As with any research, the present work suffers a number of limitations. Indeed, because a positivist approach is taken, these limitations take on an even wider role than in other research, as construction of a research model such as the model developed here must necessarily leave out variables, moderators and mediators. Although, the model here is as general as was possible in the circumstances, it yet points the way to several areas where further research would add value to the debate. These are presented here in no particular order and are, no doubt, incomplete. Nevertheless, they may offer some

guidance to researchers who choose to follow and build a road from the track trodden here.

The results are based on a cross-sectional research design. Therefore inferences of causality of co-creation and its marketing outcomes must be held in abeyance subject to investigating co-creation and its outcomes in a longitudinal study. Although cross-sectional studies are the norm rather than the exception in research in marketing, the value of longitudinal studies is hard to over-emphasise.

The research employs quasi-experimental role-playing scenarios to trigger co-creation in the marketing exchange context. The participants in the study then evaluate the degree of co-creation in the experimental scenarios and subsequently assess its influence on marketing outcome variables in the research model. Therefore the participants in the study were required to role-play the customer in the experimental scenarios. Quasi-experimental scenarios were adopted as although co-creation abounds in the marketplace, the construct is relatively unknown in a formal sense, hence the adoption of quasi-experiments facilitate theoretical considerations in controlling for confounding factors to mitigate bias in the results in the study. As co-creation strategies in business evolve and grow in the marketplace, this offers greater opportunities for future research to collect data from “real-life” co-created marketing exchanges in the marketplace in future research studies.

The current study investigates the value outcomes of co-creation from the perspective of the customer. This was quite deliberate, but nevertheless does represent a limitation of the study. However, the conceptual literature on co-creation suggests that co-creation has the potential to create value outcomes for both the buyer and seller; therefore a future study may usefully investigate the contribution of co-creation from the perspective of the seller or capture the outcomes of co-creation of the buyer and seller from both sides of the dyad.

The study investigates co-creation in four business fundamental contexts, B2B, B2C, product and service. Future studies could expand the contexts of co-creation. For example, studies could examine the role of co-creation in other commercial business contexts, social marketing or political marketing contexts.

#### 7.4.2 Extension opportunities derived from results of research

In the same way that the study reported here has shortcomings, it does make useful contributions. These contributions provide answers of a sort and themselves lead to further questions, as is the nature of all research. Once more, there is no particular hierarchical order to the comments below, but all could possibly provide inspiration to future authors.

This study has developed a specific conceptualisation of co-creation synthesised from the literature to investigate co-creation's influence on its outcomes, future research may adopt different conceptualisations of co-creation to investigate the outcomes of co-creation. This seems, at first blush, a trivial matter, but actually it is quite profound. There are a multitude of concepts very similar to co-creation, and a number of definitions of co-creation, most of which have been discussed earlier in this thesis. Each of them has nuances of meaning that could have quite important ramifications for the postulated outcomes. Take for instance, co-creation and co-production. They have many similarities, but also quite different meanings that have implications for resource use, activities and probably for outcomes as well.

Closely linked to this latter point is the need for the development of a validated co-creation measurement scale. The results of the co-creation measurement scales developed in both pilot study and the main study in the current research show promise, but there is yet much scope for the further refinement and enhancement of a validated co-creation measurement scale in a future study.

Post-hoc analysis suggests that co-creation may arise in the forms transactional and relational co-creation as discussed earlier. The suggestions made here are somewhat speculative, as the research was not designed with this issue in mind. There is clearly an important and interesting future research opportunity concerning differences in the outcomes of co-creation for relational and transactional oriented customers.

The conceptual literature on co-creation points to a number of potential moderators of co-creation. The four business contexts in this study suggest that tangible product and intangible service offering may moderate the outcomes of co-creation. In contrast, the results in this study show that market typology context generates little difference for the outcomes of co-creation and its marketing outcome. A future study may consider confirmation of these results as there is ongoing debate and the results here are merely a single voice. Likewise, a future study can investigate whether the distinction between a tangible product offering and intangible service offering act as a moderating influences co-creation and its outcomes. Additionally factors such as the level of technology, cultural diversity of the co-creating parties or degree of degree of credence in a product or service may have moderating effects on co-creation.

More recently, the conceptual literature on co-creation suggests that emotions are an outcome in a co-created marketing exchange (Payne et al., 2008). This is a fascinating and potentially rich area of discovery and very worthy of further consideration. A future study could investigate not only the role of emotions as an outcome of co-creation but also its mediating influence on other marketing outcome constructs. Emotions in co-creation may not only arise as an outcome and mediating construct, but may well be a moderating factor for co-creation.



## 7.5 Thesis conclusion

The research reported in this thesis does, of course, contain flaws and omissions, and leaves issues for further pondering, as does most research. Nevertheless, the provision of empirical evidence to support the many academic proponents of the influence of co-creation on marketing outcomes does provide a significant contribution to the marketing literature. In particular, the inclusion of multiple business contexts adds confidence to the findings and value to this research. Finally, a concrete platform is set forth to progress future research opportunities on the issue of co-creation in the marketing discipline.

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## APPENDICES

### Appendix 1A Pilot study high co-creation scenario

#### Data-gathering exercise for our Ongoing Project

Gender:                                      Male                                      Female

Please read this little story, and then answer the questions in the questionnaire below, Thanks!

Imagine that you have been invited to stay in London with your married, older brother for a two-week holiday. The accommodation is, of course, free, and the prospect of an early summer holiday very attractive. There seems no problem, as the School has a between-semester break and your kindly brother has sent some cash toward the tickets.

Quite excited, you try booking your flights on-line, but it proves really hard and, anyway, you don't have a credit card so it would be impossible to pay on-line. So, off to the travel agent you go. Your friend has recommended an excellent agent situated in Holland Village; you have your travel dates all sorted out and ring the agency; John Tan answers and you make an appointment to see him.

When you arrive at the agency, John seems nice enough, and greets you with a smile. After chatting in general about your fabulous holiday offer, you tell John the days you wish to travel and ask him for the cheapest return ticket. John turns to his computer and, a few minutes later, produces a list of four flights leaving that day for London. John turns to his computer and, a few minutes later, produces a list of four flights leaving that day for London. Of the four airlines the cheapest one is leaving at 8.00 in the morning, and another two leave late but get into London very early in the morning indeed. Qantas have a flight leaving at 11.00 in the morning, so you don't have to arrive at the airport at an uncivilized, early hour, but it is slightly more expensive than the less convenient flights. You discuss this with John and decide that the Qantas flight is the best choice, priced at \$1,506.00. You ask for a window seat and John brings up the aircraft seating plan on his console and turns it so you can see. You then discuss the relative merits of being on the escape hatch row near the kitchen versus another row away from the kitchen and toilets but with less leg-room. You decide on the escape-hatch row and John secures seat 34A for you, for both the outward and return flights. Finally, John assures you that he has noted your requirement for vegetarian food.

You leave the agency feeling very pleased with your purchase.

## Appendix 1B Pilot study moderate co-creation scenario

### Data-gathering exercise for our Ongoing Project

Gender:                      Male                      Female

Please read this little story, and then answer the questions in the questionnaire below, Thanks!

Imagine that you have been invited to stay in London with your married, older brother for a two-week holiday. The accommodation is, of course, free, and the prospect of an early summer holiday very attractive. There seems no problem, as the School has a between-semester break and your kindly brother has sent some cash toward the tickets.

Quite excited, you try booking your flights on-line, but it proves really hard and, anyway, you don't have a credit card so it would be impossible to pay on-line. So, off to the travel agent you go. Your friend has recommended an excellent agent situated in Holland Village; you have your travel dates all sorted out and ring the agency; John Tan answers and you make an appointment to see him.

When you arrive at the agency, John seems nice enough, and greets you with a smile. After chatting in general about your fabulous holiday offer, you tell John the days you wish to travel and ask him for the cheapest return ticket. John turns to his computer and, a few minutes later, produces a list of four flights leaving that day for London. Of the four airlines the cheapest one is leaving at 8.00 in the morning, and another two leave late but get into London very early in the morning indeed. Qantas have a flight leaving at 11.00 in the morning, so you don't have to arrive at the airport at an uncivilized, early hour, but it is slightly more expensive than the less convenient flights. You discuss this with John and decide that the Qantas flight is the best choice, priced at \$1,506.00. You ask for a window seat and, after checking, John finds seat 34A for you, for both the outward and return flights. Finally, John assures you that he has noted your requirement for vegetarian food.

You leave the agency feeling very pleased with your purchase.



## Appendix 1C Pilot study low co-creation scenario

### Data-gathering exercise for our Ongoing Project

Gender:        Male            Female

Please read this little story, and then answer the questions in the questionnaire below, Thanks!

Imagine that you have been invited to stay in London with your married, older brother for a two-week holiday. The accommodation is, of course, free, and the prospect of an early summer holiday very attractive. There seems no problem, as the School has a between-semester break and your kindly brother has sent some cash toward the tickets.

Quite excited, you try booking your flights on-line, but it proves really hard and, anyway, you don't have a credit card so it would be impossible to pay on-line. So, off to the travel agent you go. Your friend has recommended an excellent agent situated in Holland Village; you have your travel dates all sorted out and ring the agency; John Tan answers and you make an appointment to see him.

When you arrive at the agency, John seems nice enough, and greets you with a smile. After chatting in general about your fabulous holiday offer, you tell John the days you wish to travel and ask him for the cheapest return ticket. John has no hesitation and states that Qantas have a flight that morning, priced at a very reasonable \$1,506.00. It leaves at 11.00 in the morning and so you don't have to arrive at the airport at an uncivilized, early hour. You ask for a window seat and, after checking, John finds seat 34A for you, for both the outward and return flights. Finally, John assures you that he has noted your requirement for vegetarian food.

You leave the agency feeling very pleased with your purchase.

## Appendix 2 Pilot study participant survey questionnaire

Please indicate the extent, to which you agree or disagree to the following statements by writing an appropriate number in the box opposite each statement, where:

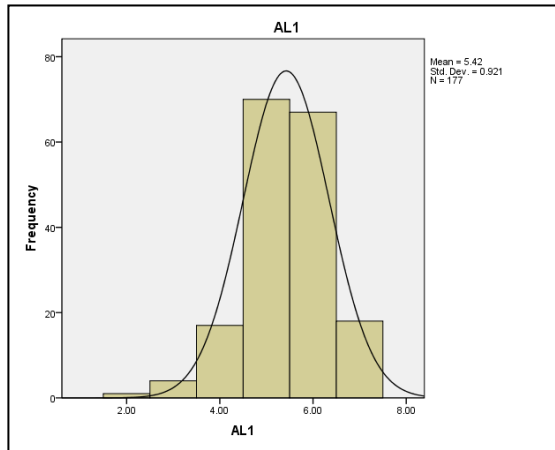
	Disagree Strongly	1	2	3	4	5	6	7	Agree Strongly
1	I would highly recommend my travel agent to my friends and family								
2	In our relationship, my travel agent can be counted to do what is right								
3	It is risky to change as a new travel agent may not give such good service								
4	The probability that I will use this service again in future is very high								
5	I am likely to make positive comments about my travel agent to my friends and family								
6	Overall, I am pleased with the services offered by my travel agent								
7	My relationship to this specific travel agent is very strong								
8	In our relationship, my travel agent has high integrity								
9	As long as the present service continues, I doubt that I would travel agent								
10	The services offered by my travel agent meet my expectations								
11	My relationship to this specific travel agent is very important to me								
12	In our relationship, my travel agent can be trusted at all times								
13	In the future I intend to use more of the services offered by my travel agent								
14	I think I did the right thing when I took up the services provided by this travel agent								
15	I intend to continue using my travel agency over some time								
16	My relationship to this specific travel agent is something I really care about								
17	If I had to do it over again, I would still engage this travel agency								
18	I would feel upset if I terminated my current relationship with my travel agent								
19	I would lose a comfortable relationship with my current service provider if I change to another travel agency								

We are interested in the concept of “Customer co-creation,” which occurs when a company and their customer work together to create a (purchase) solution. Now, please consider the passage you read before answering the questions and answer the few questions below, using the same “strongly disagree” (1) to “Strongly agree” (7) scale as before.

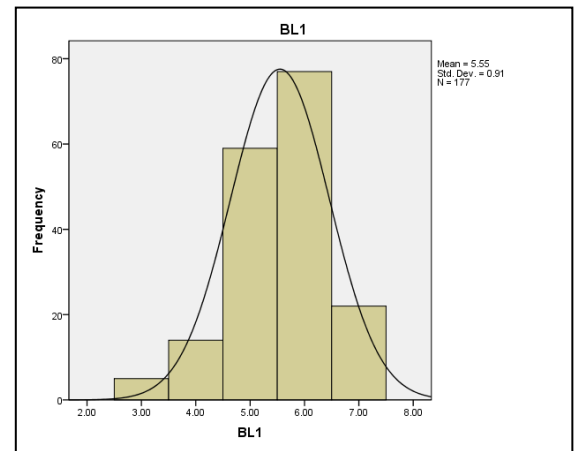
20	The company really went out of its way to work with the customer	
21	The final purchase solution was arrived at mainly through the joint effort of the company and the customer	
22	I would describe the situation described as a very high level of purchasing co-creation	

### Appendix 3 Pilot study normal distribution histograms for scale items

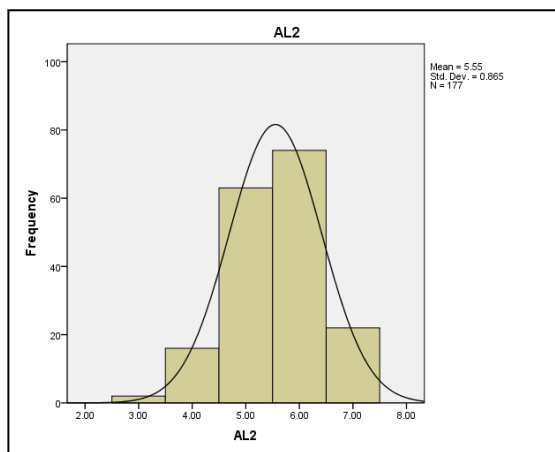
Attitudinal Loyalty 1



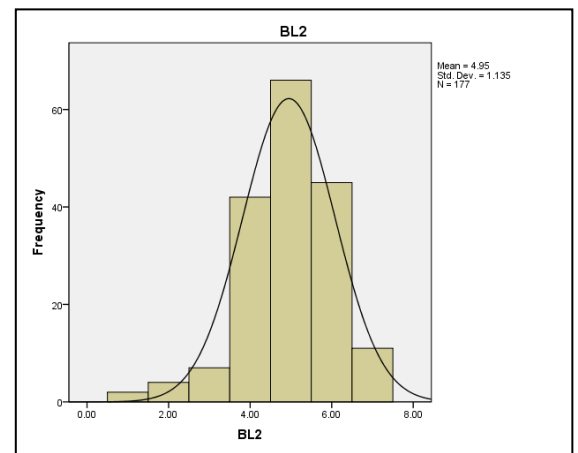
Behavioural Loyalty 1



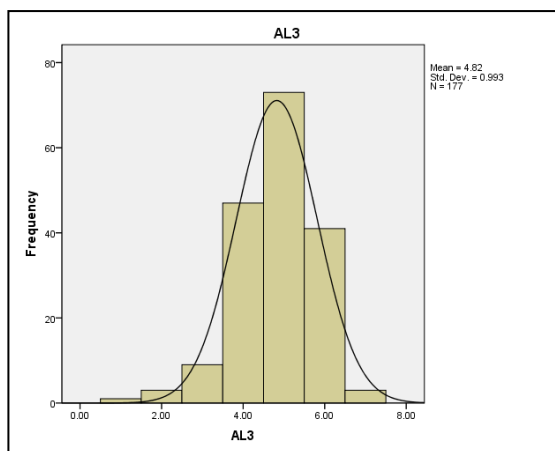
Attitudinal Loyalty 2



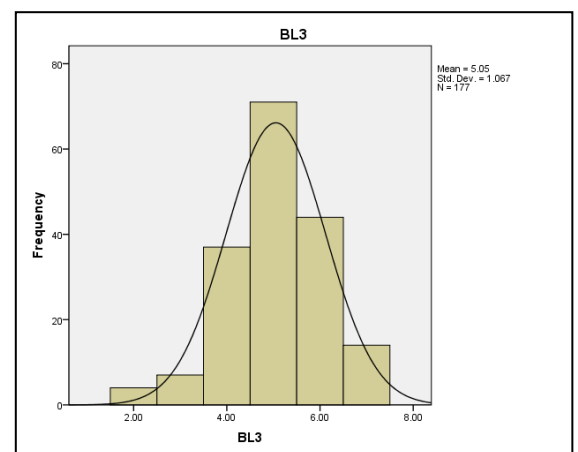
Behavioural Loyalty 2



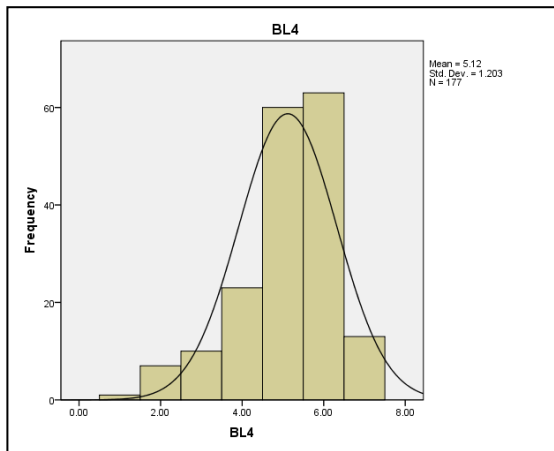
Attitudinal Loyalty 3



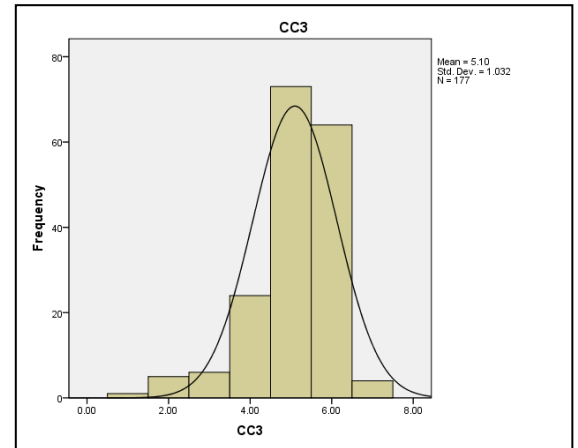
Behavioural Loyalty 3



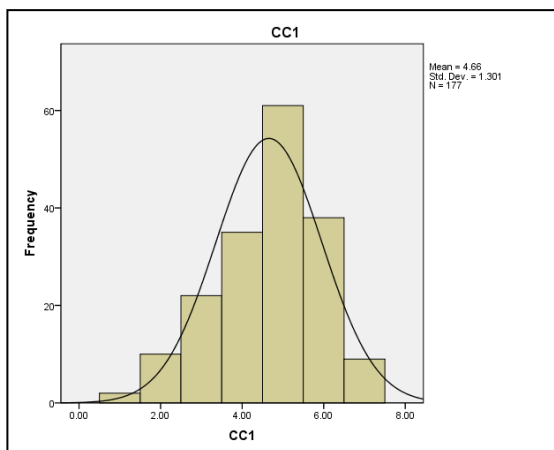
## Behavioural Loyalty 4



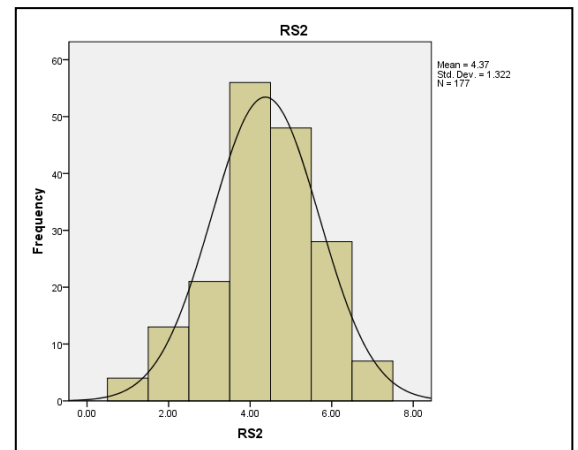
## Co-creation 3



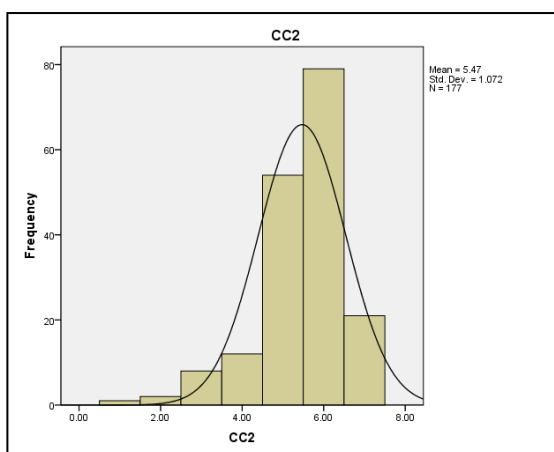
## Co-creation 1



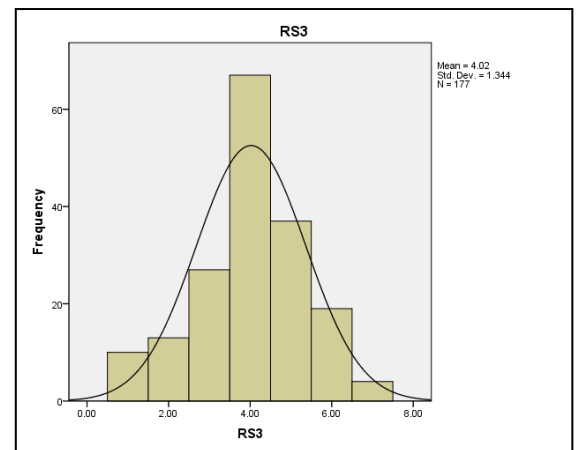
## Relationship Strength 2



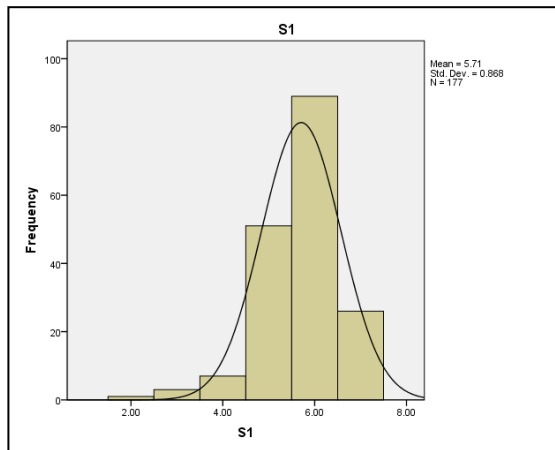
## Co-creation 2



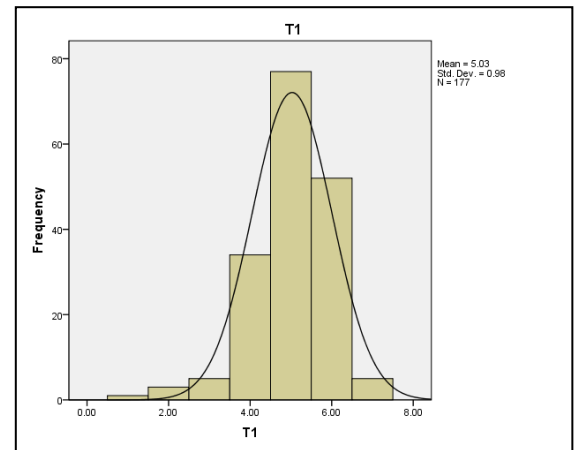
## Relationship Strength 3



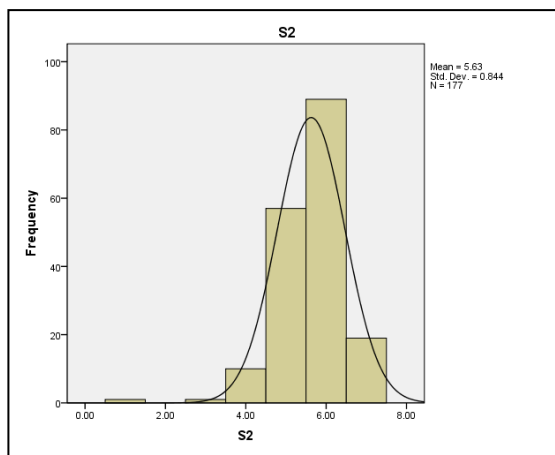
Satisfaction 1



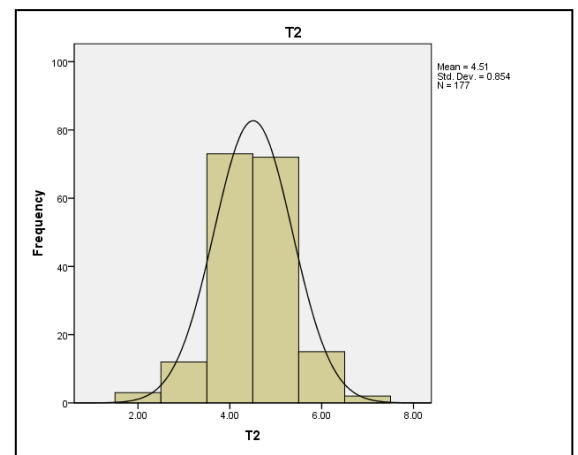
Trust 1



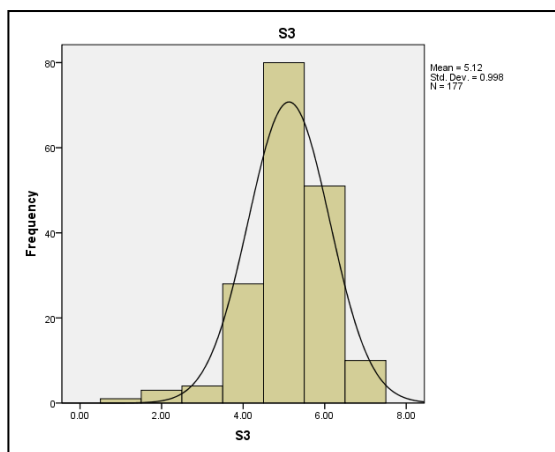
Satisfaction 2



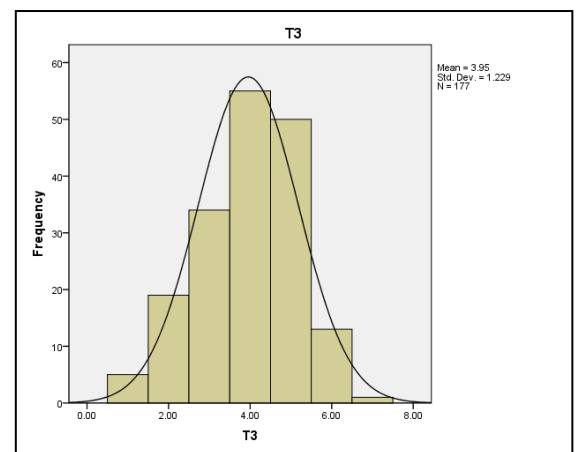
Trust 2



Satisfaction 3



Trust 3



#### Appendix 4 Pilot study check for normal distribution for scale items

	AL1	AL2	AL3	BL1	BL2	BL3	BL4	CC1	CC2	CC3	RS2	RS3	S1	S2	S3	T1	T2	T3
N =	177	177	177	177	177	177	177	177	177	177	177	177	177	177	177	177	177	177
Mean	5.42	5.55	4.82	5.55	4.95	5.05	5.12	4.66	5.47	5.10	4.37	4.02	5.71	5.63	5.12	5.03	4.51	3.95
Standard.deviation	0.92	0.87	0.99	0.91	1.13	1.07	1.20	1.30	1.07	1.03	1.32	1.34	0.87	0.84	1.00	0.98	0.85	1.23
Skewness	0.50	0.27	0.63	0.53	0.66	0.36	0.93	0.48	1.17	1.20	0.31	0.30	0.92	1.15	0.81	0.86	-0.08	-0.32
Std. error of skewness	0.18	0.18	0.18	0.18	0.18	0.18	0.18	0.18	0.18	0.18	0.18	0.18	0.18	0.18	0.18	0.18	0.18	0.18
Z score skewness	2.74	1.50	3.43	2.91	3.58	1.95	5.05	2.62	6.37	6.55	1.70	1.62	5.01	6.30	4.42	4.72	0.45	1.76
Kurtosis	0.76	-0.08	1.01	0.35	1.11	0.36	0.85	-0.13	2.15	2.07	0.08	0.05	2.07	4.53	2.02	1.80	0.73	-0.32
Std. error of kurtosis	0.36	0.36	0.36	0.36	0.36	0.36	0.36	0.36	0.36	0.36	0.36	0.36	0.36	0.36	0.36	0.36	0.36	0.36
Z score kurtosis	2.09	0.21	2.78	0.97	3.07	0.99	2.34	0.37	5.91	5.69	0.22	0.13	5.69	12.5	5.56	4.97	2.01	0.87

## Appendix 5a Main study *B2C product scenario* (high co-creation)

Please read this short scenario and provide a response to the statements below. Thanks

Imagine you are shopping for a new desktop personal computer for use in your household. You are mindful that the new computer has to cater for needs of different members of your household. You go to Tech-Infinity Computers, a reputable computer supplier on the recommendation of a friend and talk to Cameron, a sales staff in the computer shop about your computer requirements. Cameron and you discuss your computer requirements. From the discussion, it becomes clear to you that a custom-built desktop computer would best suit your computing needs.

Cameron and you discuss the advantages and disadvantages of a custom-built computer. From the conversation it becomes evident to you that a custom-built computer offers value for money as well flexibility when your computing needs expands. So you decide on a custom-built desktop computer for your purchase.

Cameron briefs you on the steps in custom building a computer and provides you with a component parts catalogue for you to make your selections. When Cameron returns a few minutes later, you explain that you have made your selections; however you are unsure of a couple of items in your list of component parts. Cameron and you discuss your difficulties thoroughly and you finalise the list of components for your personal computer.

Cameron prices the computer at \$1,975.00. You agree on the price and Cameron indicates your computer will be assembled later in the day and you can pick your computer up the next morning. The next morning you return to the shop, pay for the computer and take it home.

A day later you receive an email message from Cameron thanking you for the business and assuring you that you should have no hesitation in contacting Cameron if there any issues with regards to your purchase. The email ends with a note that the company hopes that you will return for your future computer related purchases. The email also asks you whether you wish to be on the company email list for information on new products and promotions.

## Appendix 5b Main study *B2C product scenario* (moderate co-creation)

Please read this short scenario and provide a response to the statements below. Thanks

Imagine you are shopping for a new desktop personal computer for use in your household. You are mindful that the new computer has to cater for needs of different members of your household. You go to Tech-Infinity Computers, a reputable computer supplier on the recommendation of a friend and talk to Cameron, a sales staff in the computer shop about your computer requirements. Cameron and you discuss your computer requirements. From the discussion, it becomes clear to you that a custom-built desktop computer would best suit your computing needs. So you decide on a custom-built desktop computer for your purchase.

Cameron takes out a component parts catalogue, marks off component parts for your custom-built computer, and gets you to look at the list and confirm the selections. Cameron leaves you for a few minutes while you are looking at the list of component parts for your computer. When Cameron returns you inform that you agree with most of the selections except you want a more powerful graphics card, a larger computer screen and a cordless keyboard.

Cameron prices the computer at \$1,975.00. You agree on the price and Cameron indicates your computer will be assembled later in the day and you can pick your computer up the next morning. The next morning you return to the shop, pay for the computer and take it home. A day later you receive an email from the company thanking you for the business. The email also asks you whether you wish to be on the company email list for information on new product and promotions.



## Appendix 5c Main study *B2C product scenario* (low co-creation)

Please read this short scenario and provide a response to the statements below. Thanks

Imagine you are shopping for a new desktop personal computer for use in your household. You are mindful that the new computer has to cater for needs of different members of your household. You go to Tech-Infinity Computers, a reputable computer supplier on the recommendation of a friend and talk to Cameron, a sales staff in the computer shop about your computer requirements. Cameron and you discuss your computer requirements. From the discussion, it becomes clear to you that a custom-built desktop computer would best suit your computing needs. So you decide on a custom-built desktop computer for your purchase.

Cameron takes out a component parts catalogue and marks all the components making up your computer. Cameron prices the computer at \$1,975.00. You agree on the price and Cameron indicates your computer will be assembled later in the day and you can pick your computer the next morning.

The next morning you return to the shop, pay for the computer and take it home. A day later you receive a standard email addressed to all new customers of the computer company asking whether you wish to be on the email list for information on new products and promotions.

## Appendix 5d Main study *B2C service scenario* (high co-creation)

Please read this short scenario and provide a response to the statements below. Thanks

Imagine you have to travel to London to meet up a good friend you have not seen for 10 years. Your friend has a large home and you will have accommodation in your friend's home during your trip. This is your first trip to London and you are excited about the trip. A colleague at work has recommended a well-known travel agent in Queen Street who can make airline bookings for your overseas travel. You have all the necessary travel dates sorted and telephone the travel agency for an appointment. When you arrive at the agency, Jordan greets you with a smile. After chatting in general about your trip to London, you inform Jordan the days you wish to make the air travel booking.

Jordan turns to the computer and, a few minutes later, produces a list of four flights leaving that day for London. Jordan and you discuss the 4 flights. All 4 flights are from equally reputable airlines companies. Of the four airlines the cheapest one leaves at 5.00 in the morning, and another leaves late in the evening, but arrives into Heathrow International Airport in London very early in the morning. Globe-Trotter Airlines has a flight leaving at 9.00 in the morning, so you don't have to arrive at the airport at an uncivilized, early hour, but it is slightly more expensive than the less convenient flights. World Traveller Airlines also has a flight that leaves at 10.30 am. Both these flights are priced at \$2,290.00. You initially think that the Globe-Trotter flight is your preferred option, but as you talk to Jordan, you suddenly realise that the World Traveller Airlines flight would enable your partner to drop you off at the airport and avoid the early morning traffic on the motorway to get to work on time into the centre of city. So you choose the World Traveller Airlines flight.

You request for window seating and vegetarian meals for both ways of your flight.

Jordan brings up the aircraft-seating plan on his computer console and turns it around so you can see. You then discuss the relative merits of being in the escape hatch row near the kitchen compared to another row away from the kitchen and toilets, but with less leg-room. You decide on the escape-hatch row and Jordan secures seat 34A for both the outward and return journeys.

For your choice of meals on the flight, Jordan brings up the on-line meals menu and you see that there are 3 categories of vegetarian meals that the airline provides. You ask Jordan whether you can choose from all three categories for your meal choices. Jordan checks on your enquiry and indicates that you can choose your preferred combination. You then choose to have the Asian vegetarian meal for lunch and Western vegetarian meal for dinner on your way to London. On your return trip home, you opt for the Indian vegetarian for lunch and Western vegetarian meal for dinner.

You leave the travel agency and when you get home, you get an email from Jordan confirming your flight bookings and thanking you for choosing to do business with the travel agency. The email further adds that you should contact the travel agency for any further assistance with your travel plans or if there are any changes to be made and conveys best wishes for your travel.

## Appendix 5e Main study *B2C service scenario* (moderate co-creation)

Please read this short scenario and provide a response to the statements below. Thanks

Imagine you have to travel to London to meet up a good friend you have not seen for 10 years. You friend has a large home and you will have accommodation in your friend's home during your trip. This is your first trip to London and you are excited about the trip. A colleague at work has recommended a well-known travel agent in Queen Street who can make airline bookings for your overseas travel. You have all the necessary travel dates sorted and telephone the travel agency for an appointment. When you arrive at the agency, Jordan greets you with a smile. After chatting in general about your trip to London, you inform Jordan the days you wish to make the air travel booking.

Jordan turns to the computer and, a few minutes later, produces a list of four flights leaving that day for London. Jordan and you discuss the 4 flights. All 4 flights are from equally reputable airlines companies. Of the four airlines, the cheapest one leaves at 5.00 in the morning, and another leaves late in the evening, but arrives into Heathrow International Airport in London very early in the morning. Globe-Trotter Airlines has a flight leaving at 9.00 in the morning, so you don't have to arrive at the airport at an uncivilized, early hour, but it is slightly more expensive than the less convenient flights. World Traveller Airlines also has a flight that leaves at 10.30 am. Both these flights are priced at \$2,290.00. You initially think that the Globe-Trotter flight is your preferred option, but as you talk to Jordan, you suddenly realise that the World Traveller Airlines flight would enable your partner to drop you off at the airport and avoid the early morning traffic on the motorway to get to work on time into the centre of city. So you choose the World Traveller Airlines flight.

You request for both window seating and vegetarian meals. After checking, Jordan finds seat 34A for both the outward and return flights. Finally, Jordan puts in your request for vegetarian meals.

You leave the travel agency and when you get home, you get an email from Jordan confirming your flight bookings with a note of thanks for your business with the travel agency.

Appendix 5f Main study *B2C service scenario* (low co-creation)

Please read this short scenario and provide a response to the statements below. Thanks

Imagine you have to travel to London to meet up a good friend you have not seen for 10 years. You friend has a large home and you will have accommodation in your friend's home during your trip. This is your first trip to London and you are excited about the trip. A colleague at work has recommended a well-known travel agent in Queen Street who can make airline bookings for your overseas travel. You have all the necessary travel dates sorted and telephone the travel agency for an appointment. When you arrive at the agency, Jordan greets you with a smile. After chatting in general about your trip to London, you inform Jordan the days you wish to make the air travel booking.

Jordan turns to the computer and a few minutes' later states that World Traveller Airlines has a flight in the morning, and is priced reasonably at \$2,290.00. The flight departs at 10.30 am which means that you won't arrive in London at an uncivilised early hour of the morning. You request for both window seating and vegetarian meals. After checking, Jordan finds seat 34A for both the outward and return flights. Finally, Jordan puts in your request for vegetarian meals.

You leave the travel agency and when you get home, you get an email from the travel agency containing the standardised travel itinerary printout of your flight booking.

## Appendix 5g Main study *B2B product scenario* (high co-creation)

You are a manager in a company and require a high performance desktop computer. Your boss approves your request for a new computer and suggests that you choose a reliable and reputable computer supplier. Your colleague recommends Tech-Infinity Computer Company. You ring the company and Cameron, one of the sales staff agrees to come over to discuss your computing needs. When Cameron arrives, you take Cameron to the meeting room where you have a discussion of your computer requirements. From the discussion with Cameron it soon becomes clear to you that a custom-built computer would best suit meet your computing needs.

Cameron and you discuss the advantages and disadvantages of a custom built computer. So you decide on a custom-built desktop computer for your purchase since it offers value for money and flexibility as your computing needs expands.

Cameron briefs you on the steps in custom building a computer and provides you with a component parts catalogue for you to make your selections. Cameron leaves the meeting room for a few minutes while you make your choices. When Cameron returns a few minutes later, you explain that you have made your selections; however, you are unsure of a couple of items in your list of component parts. Cameron and you discuss your difficulties thoroughly and you finalise the list of components for your personal computer together. Cameron prices the computer at \$1975.00. You agree on the price and Cameron indicates that your computer will be assembled later in the day and delivered to your office the next morning.

The next morning Cameron delivers the desktop computer to your office and assists you to set it up. A day later you receive an email message from Cameron thanking you for the business and assuring you that you should have no hesitation to in contacting Cameron if there any issues with regards to your purchase. The email ends with a note that the company hopes that you will return for your future computer related purchases. The email also asks you whether you wish to be on the company email list for information on new products and promotions.

## Appendix 5h Main study *B2B product scenario* (moderate co-creation)

Please read this short scenario and provide a response to the statements below. Thanks

You are a manager in a company and require a high performance desktop computer. Your boss approves your request for a new computer and suggests that you choose a reliable and reputable computer supplier. Your colleague recommends Tech-Infinity Computer Company. You ring the company and Cameron, one of the sales staff agrees to come over to discuss your computing needs.. When Cameron arrives, you take Cameron to the meeting room where you have a discussion of your computer requirements. From the discussion with Cameron it becomes clear to you that custom-built computer would best suit your computing needs. So you decide to purchase a custom-built desktop computer.

Cameron takes out a component parts catalogue, marks off component parts for your custom-built computer, and gets you to look at the list and confirm the selections. Cameron leaves the meeting room for a few minutes while you consider the list of component parts for your computer. When Cameron returns you inform that you agree with most of the selections except that you require a more powerful graphics card, a larger computer screen and a cordless keyboard.

Cameron prices the computer at \$1975.00. You agree on the price and Cameron indicates your computer will be delivered to your office the next morning. The next morning Cameron delivers the desktop computer to your office. A day later, you receive an email from the company thanking you for the business. The email also asks you whether you would wish to be on the company email list for information on new product and promotions.

Appendix 5i Main study *B2B product scenario* (low co-creation)

Please read this short scenario and provide a response to the statements below. Thanks

You are a manager in a company and require a high performance desktop computer. Your boss approves your request for a new computer and suggests that you choose a reliable and reputable computer supplier. Your colleague recommends Tech-Infinity Computer Company. You ring the company and Cameron, one of the sales staff agrees to come over to discuss your computing needs.. When Cameron arrives, you take Cameron to the meeting room where you have a discussion of your computer requirements. From the discussion with Cameron it becomes clear to you that custom-built computer would best suit your computing needs. So you decide to purchase a custom-built desktop computer.

Cameron takes out component parts catalogue and marks all the components making up your computer. Cameron prices the computer at \$1975.00. You agree on the price and Cameron indicates your computer will be assembled later in the day and delivered the next morning.

The next morning Cameron delivers the computer to your office. A day later you receive a standard email addressed to all new customers of the computer company asking whether you wish to be on the email list for information on new products and promotions.

Appendix 5j Main study *B2B service scenario* (high co-creation)

Please read this short scenario and provide a response to the statements below. Thanks  
Imagine you are a Manager in a company. You have to travel on a business trip to London to meet a supplier. While you are in London you will stay with your friend. Your colleague recommends a travel agent in Queen Street who can make airline bookings for your business trip. You have all the necessary travel dates sorted and telephone the travel agency for an appointment to see the travel agent. When you arrive at the agency, Jordan, the travel agent greets you. After a general chat about your business trip, you inform Jordan the dates on you wish to travel.

Jordan turns to the computer and, a few minutes later, produces a list of four flights leaving that day for London. Jordan and you discuss the four flights. All four flights are from equally reputable airline companies. From your discussion, you realise that the first flight makes a number of inconvenient stopovers. The second flight is also inconvenient as it arrives in the early hours of the morning into London. Both these flight are slightly cheaper. The remaining two flights are Globe-Trotter Airlines and World Traveller Airlines flights. Both flights depart around mid-morning one hour apart and arrive mid-day in London. Both are priced at \$2,290.00. You initially lean toward choosing the Globe-Trotter Airlines flight but as you reflect on your conversation with Jordan you decide to take the slightly later-scheduled World Traveller Airlines flight. It becomes apparent from your conversations that taking the slightly later flight means you can avoid the early morning traffic getting to the airport.

You then request for window seating as well as vegetarian meals.  
Jordan brings up the aircraft-seating plan on the computer console and turns it around so you can see the computer screen. Both of you talk about advantages and disadvantages of which seat rows to choose. The discussion leads you to select a window seat in the rear rows in a quieter section of the aircraft away from kitchen and toilets as your preferred seating. Jordan secures seat 34A for both the outward and return journeys.  
Jordan then brings up the on-line meals menu to book your vegetarian meal request. You see that there are 3 categories of vegetarian meals. You express that you wish to choose from all three categories for your vegetarian meal choices. Jordan quickly checks and confirms you can choose your preferred combination. You choose to have the Asian vegetarian meal for lunch and Western vegetarian meal for dinner on your way to London. On your return trip home, you opt for the Indian vegetarian for lunch and Western vegetarian meal for dinner.

You leave the travel agency and when you get into the office, you receive an email message from Jordan confirming your reservations and thanking you for choosing to do business with the travel agency. The email further adds that you should contact the travel agency for any further assistance with your travel plans or if there are any changes to be made and conveys best wishes for your travel.



## Appendix 5k Main study *B2B service scenario* (moderate co-creation)

Please read this short scenario and provide a response to the statements below. Thanks  
Imagine you are a Manager in a company. You have to travel on a business trip to London to meet a supplier. While you are in London, you will stay with your friend. Your colleague recommends a travel agent in Queen Street who can make airline bookings for your business trip. You have all the necessary travel dates sorted and telephone the travel agency for an appointment to see the travel agent. When you arrive at the agency, Jordan, the travel agent greets you. After a general chat about your business trip, you inform Jordan the dates on you wish to travel

Jordan turns to the computer and a few minutes' later states that there are 4 flights available, but two of the flights are inconveniently scheduled but cheaper. All four flights are from equally reputable airline companies. Jordan suggests that you consider choosing either the Globe-Trotter Airlines or World Traveller Airlines flights. Both these flights depart mid-morning one hour apart and arrive mid-day in London. Both are priced similarly at \$2,290.00. You choose the World Traveller Airlines flight as it means you can avoid the morning traffic to get to the airport.

You request for window seating and vegetarian meals. After checking seat availability, Jordan locates seat 34A in a quiet location of the aircraft. Finally Jordan brings up the online dining menu and puts in your request for vegetarian meals

You leave the travel agency and when you get to work, you get an email from Jordan confirming your bookings with a note of thanks for your business with the travel agency.

Appendix 51 Main study *B2B service scenario* (low co-creation)

Please read this short scenario and provide a response to the statements below. Thanks  
Imagine you are a Manager in a company. You have to travel on a business trip to London to meet a supplier. While you are in London, you will stay with your friend. Your colleague recommends a travel agent in Queen Street who can make airline bookings for your business trip. You have all the necessary travel dates sorted and telephone the travel agency for an appointment to see the travel agent. When you arrive at the agency, Jordan, the travel agent greets you. After a general chat about your business trip, you inform Jordan the dates on you wish to travel

Jordan turns to the computer and a few minutes' later states that World Traveller Airlines has a flight in the morning, arrives mid-day in London, and is priced at \$2,290.00. You request for window seating and vegetarian meals. After checking, Jordan locates seat 34A and places your request for vegetarian meals. You agree to Jordan's choices

You leave the travel agency and when you get to home, you get an email from the travel agency containing the standard travel itinerary printout of your reservation.

## Appendix 6A Main study Survey questionnaire for product scenario

This short survey below evaluates your perceived customer experience in the purchase situation.

When completing the survey, please assume you are the customer in the scenario you have just read. Please consider this purchase scenario as if it is your 'real' purchase.

Please indicate the extent, to which you agree or disagree to the following statements by writing an appropriate number in the box opposite each statement

Disagree  
strongly

1	2	3	4	5	6	7
---	---	---	---	---	---	---

Agree  
strongly

In our relationship, this computer company can be trusted at all times	<input type="checkbox"/>
I will encourage my friends and relatives to do business with this computer company	<input type="checkbox"/>
I felt happy during the purchase encounter	<input type="checkbox"/>
I am not likely to switch to another computer company	<input type="checkbox"/>
I consider myself to be a loyal customer of this computer company	<input type="checkbox"/>
In our relationship, this computer company has high integrity	<input type="checkbox"/>
I am likely to re-purchase from this computer company in the future	<input type="checkbox"/>
I will say positive things about this computer company to other people	<input type="checkbox"/>
I will recommend this computer company to someone who seeks my advice	<input type="checkbox"/>
I am willing to share information and knowledge with this computer company	<input type="checkbox"/>
My relationship to this computer company is important to me	<input type="checkbox"/>
This computer company makes a strong effort to get to know me	<input type="checkbox"/>
I am likely to go back to this computer company the next time I need a computer or computer related products	<input type="checkbox"/>
My relationship to this specific computer company is something I care about	<input type="checkbox"/>
I felt enthused during the purchase encounter	<input type="checkbox"/>
If I had a choice, I would use this computer company again	<input type="checkbox"/>

I use this computer company because it is the best choice for me	<input type="checkbox"/>
This computer company is distinct from other computer supplier companies	<input type="checkbox"/>
In our relationship, this computer company can be counted to do what is right	<input type="checkbox"/>
This computer company is flexible and adaptable in dealing with me	<input type="checkbox"/>
I felt excited during the purchase encounter	<input type="checkbox"/>
I felt cheerful during the purchase encounter	<input type="checkbox"/>
I think I did the right thing when I chose this computer company	<input type="checkbox"/>
I like my interactions I have with this computer company	<input type="checkbox"/>
The product and service offerings of this computer company meet my expectations	<input type="checkbox"/>
I felt pleased during the purchase encounter	<input type="checkbox"/>
I felt contented during the purchase encounter	<input type="checkbox"/>
Overall, I am pleased with the product and service offerings of this computer company	<input type="checkbox"/>
If I had to do it all over again, I would do business with this computer company	<input type="checkbox"/>

We are interested in the concept of “Customer co-creation,” which occurs when a company and their customer work together to create a customer solution. Now, please consider the scenario you read before answering the questions and answer the few questions below, using the same “strongly disagree” (1) to “Strongly agree” (7) scale as before. Please again assume that you are the customer in the scenario

My final customer solution evolved as a result of the active participation of this computer company and me	<input type="checkbox"/>
Overall, I would describe my final customer solution as a high level of customer co-creation	<input type="checkbox"/>
This computer company went out of its way to work with me	<input type="checkbox"/>
My final customer solution was arrived at through the joint efforts of this computer company and me	<input type="checkbox"/>
I contributed actively to my final customer solution	<input type="checkbox"/>

## Appendix 6B Main study Survey questionnaire for service scenario

The short survey below evaluates your perceived customer experience in the purchase situation.

When completing the survey, please assume you are the customer in the scenario you have just read.

Please consider this purchase scenario as if it is your 'real' purchase.

Please indicate the extent, to which you agree or disagree to the following statements by writing an appropriate number in the box opposite each statement

Disagree  
strongly

1

2

3

4

5

6

7

Agree  
strongly

This travel agency is flexible and adaptable in dealing with me

I felt excited during the purchase encounter

This travel agency makes a strong effort to get to know me

I am likely to go back to this travel agency the next time I need airline tickets or travel related services

I felt contented during the purchase encounter

In our relationship, this travel agency can be counted to do what is right

My relationship to this travel agency is important to me

The product and service offerings of this travel agency meet my expectations

In our relationship, this travel agency can be trusted at all times

In our relationship, this travel agency has high integrity

I will say positive things about this travel agency to other people

My relationship to this specific travel agency is something I care about

I use this travel agency because it is the best choice for me

I felt cheerful during the purchase encounter

I will recommend this travel agency to someone who seeks my advice

I am willing to share information and knowledge with this travel agency

I felt enthused during the purchase encounter

I am not likely to switch to another travel agency

I am likely to repurchase from this travel agency in the future	<input type="checkbox"/>
This travel agency is distinct from other travel agency companies	<input type="checkbox"/>
I felt happy during the purchase encounter	<input type="checkbox"/>
I think I did the right thing when I chose this travel agency	<input type="checkbox"/>
Overall, I am pleased with the product and service offerings of this travel agency	<input type="checkbox"/>
If I had a choice, I would use this travel agency again	<input type="checkbox"/>
My relationship with this specific travel agency is strong	<input type="checkbox"/>
I consider myself to be a loyal customer of this travel agency	<input type="checkbox"/>
If I had to do it all over again, I would do business with this travel agency	<input type="checkbox"/>
I felt pleased during the purchase encounter	<input type="checkbox"/>
I will encourage my friends and relatives to do business with this travel agency	<input type="checkbox"/>
I like my interactions I have with this travel agency	<input type="checkbox"/>

We are interested in the concept of “Customer co-creation,” which occurs when a company and their customer work together to create a customer solution.

Now, please consider the scenario you read before answering the questions and answer the few questions below, using the same “strongly disagree” (1) to “Strongly agree” (7) scale as before. Please again assume that you are the customer in the scenario

My final marketing solution was arrived at through the joint efforts of this travel agency and me	<input type="checkbox"/>
I contributed actively to my final customer marketing solution	<input type="checkbox"/>
This travel agency went out of its way to work with me	<input type="checkbox"/>
Overall, I would describe my final customer solution as a high level of customer co-creation	<input type="checkbox"/>
My final customer solution evolved as a result of the active participation of this travel agency and me	<input type="checkbox"/>



## Appendix 7 Main study Ethics approval letter

# MEMORANDUM

## *Auckland University of Technology Ethics Committee (AUTEC)*

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To: Roger Marshall

From: **Madeline Banda** Executive Secretary, AUTEC

Date: 31 March 2010

Subject: Ethics Application Number 10/11 **Customer co-creation: one step closer to customer-centric marketing.**

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Dear Roger

Thank you for providing written evidence as requested. I am pleased to advise that it satisfies the points raised by the Auckland University of Technology Ethics Committee (AUTEC) at their meeting on 8 February 2010 and that I have approved your ethics application. This delegated approval is made in accordance with section 5.3.2.3 of AUTEC's *Applying for Ethics Approval: Guidelines and Procedures* and is subject to endorsement at AUTEC's meeting on 10 May 2010.

Your ethics application is approved for a period of three years until 31 March 2013.

I advise that as part of the ethics approval process, you are required to submit the following to AUTEC:

- A brief annual progress report using form EA2, which is available online through <http://www.aut.ac.nz/research/research-ethics>. When necessary this form may also be used to request an extension of the approval at least one month prior to its expiry on 31 March 2013;
- A brief report on the status of the project using form EA3, which is available online through <http://www.aut.ac.nz/research/research-ethics>. This report is to be submitted either when the approval expires on 31 March 2013 or on completion of the project, whichever comes sooner;

It is a condition of approval that AUTEC is notified of any adverse events or if the research does not commence. AUTEC approval needs to be sought for any alteration to the research, including any alteration of or addition to any documents that are provided to participants. You are reminded that, as applicant, you are responsible for ensuring that research undertaken under this approval occurs within the parameters outlined in the approved application.

Please note that AUTEC grants ethical approval only. If you require management approval from an institution or organisation for your research, then you will need to make the arrangements necessary to obtain this. Also, if

your research is undertaken within a jurisdiction outside New Zealand, you will need to make the arrangements necessary to meet the legal and ethical requirements that apply within that jurisdiction.

When communicating with us about this application, we ask that you use the application number and study title to enable us to provide you with prompt service. Should you have any further enquiries regarding this matter, you are welcome to contact Charles Grinter, Ethics Coordinator, by email at [ethics@aut.ac.nz](mailto:ethics@aut.ac.nz) or by telephone on 921 9999 at extension 8860.

On behalf of the AUTEK and myself, I wish you success with your research and look forward to reading about it in your reports.

Yours sincerely



Madeline Banda

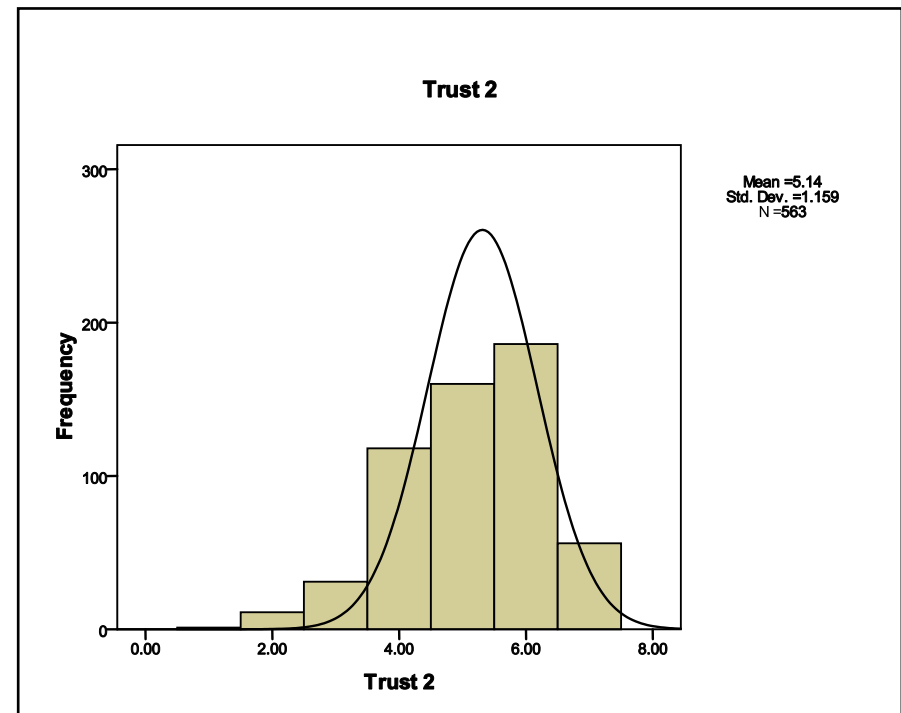
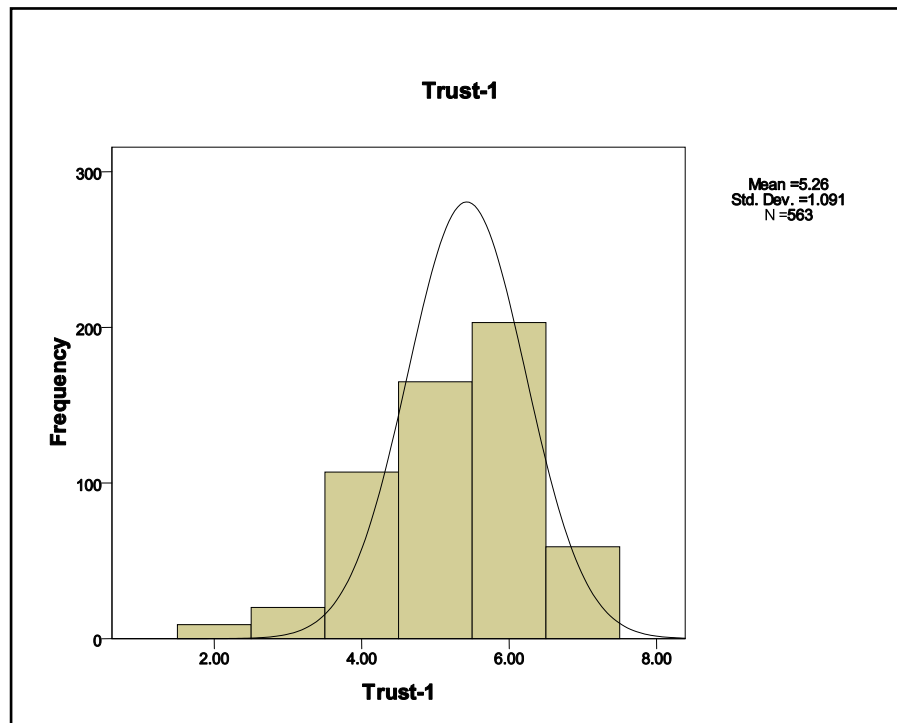
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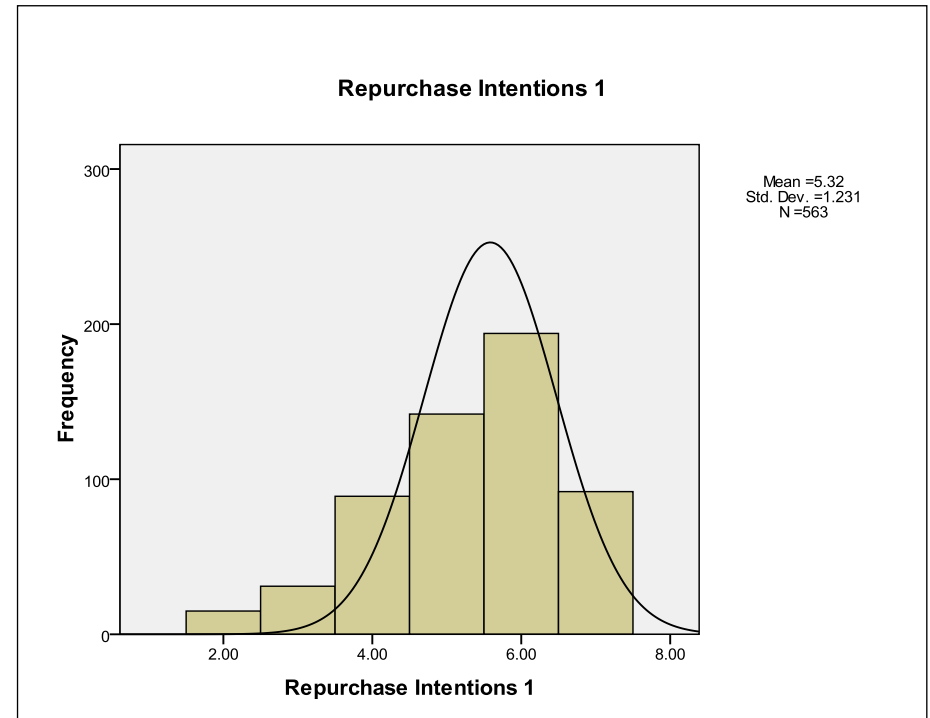
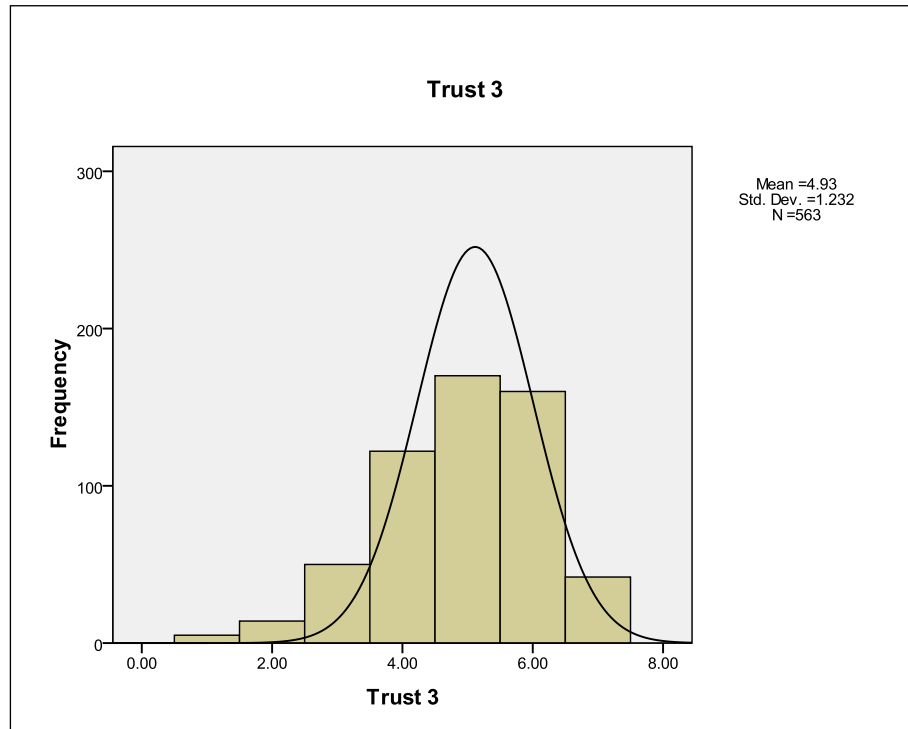
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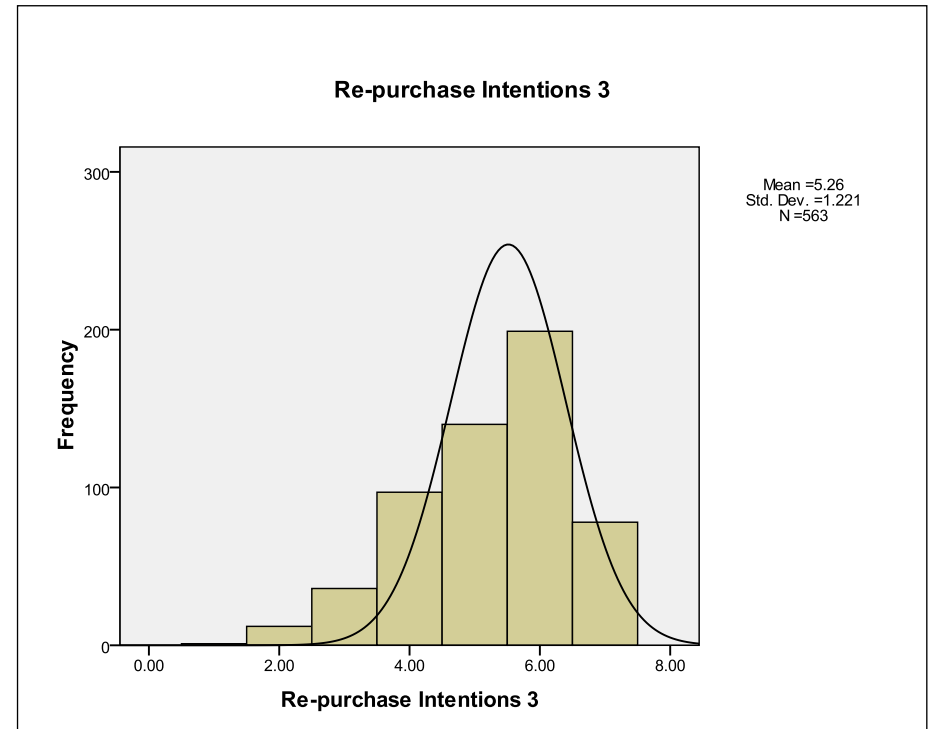
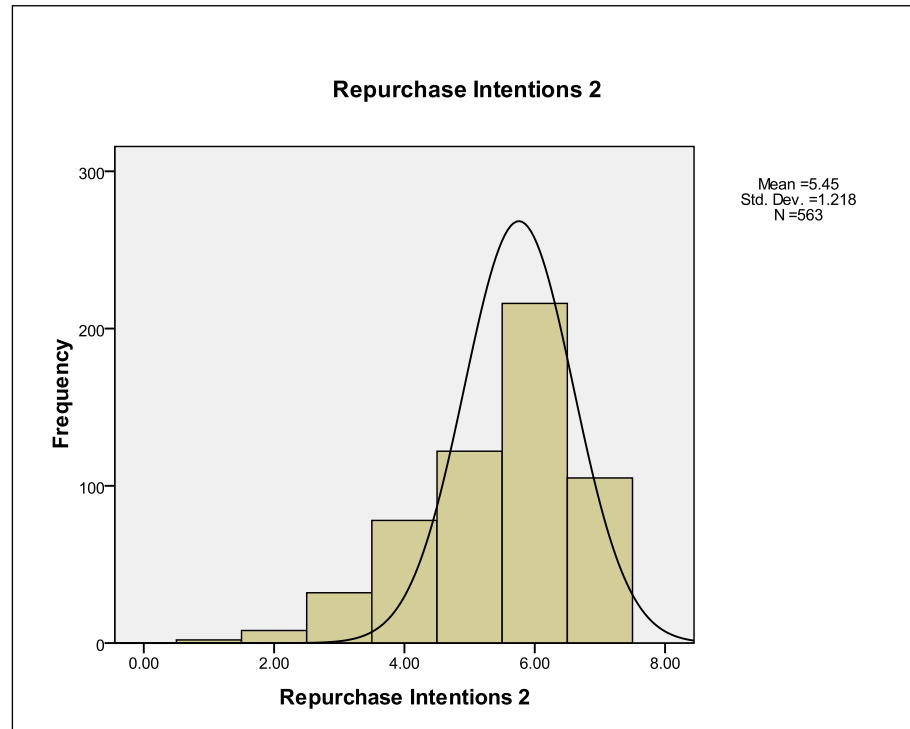
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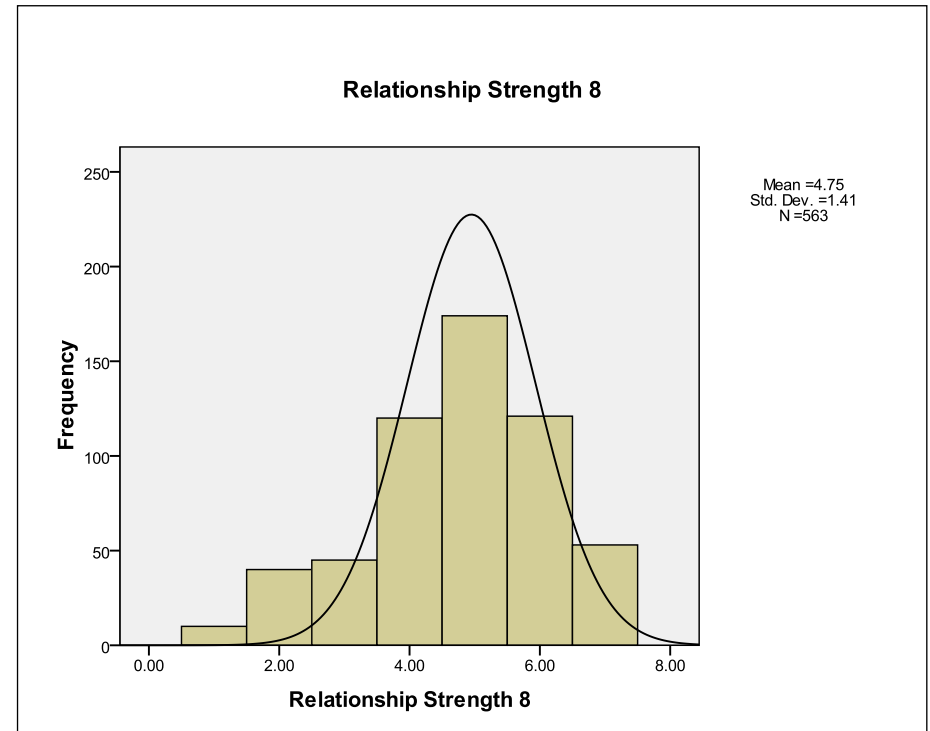
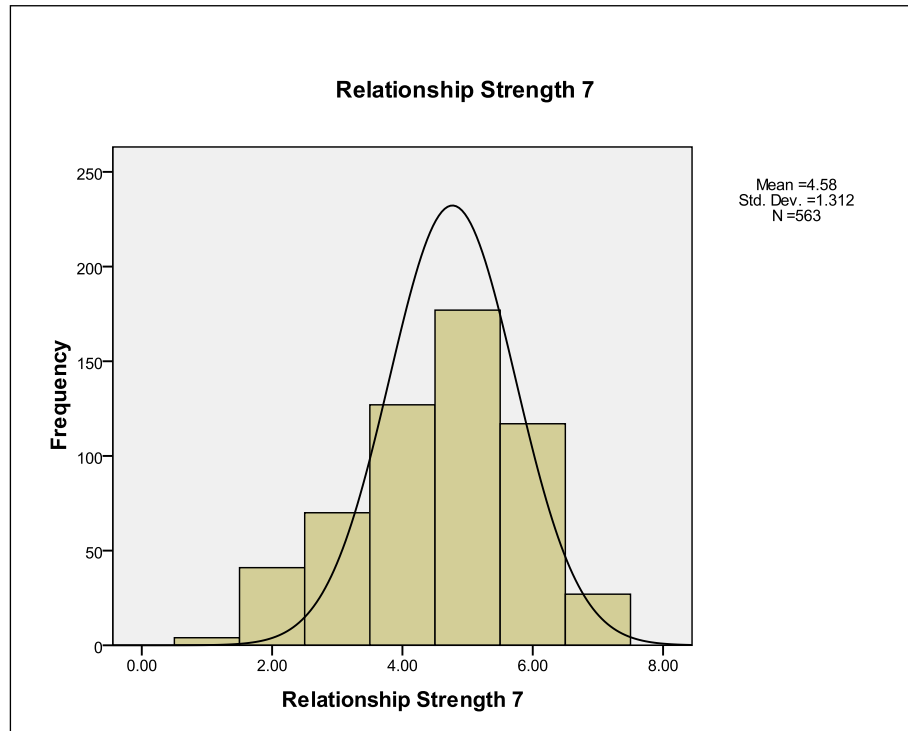


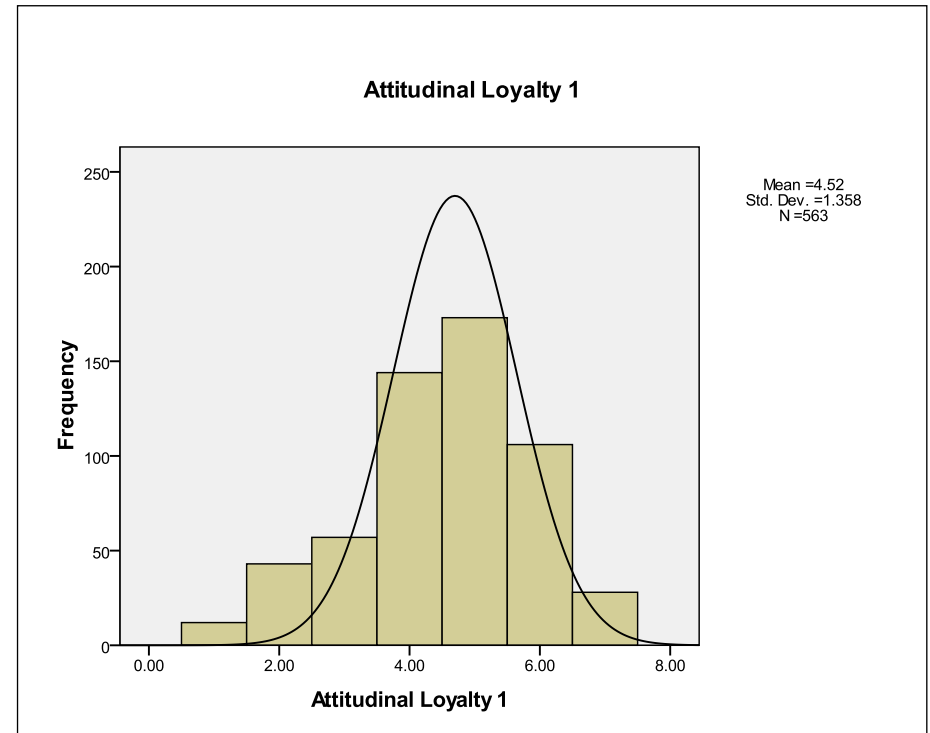
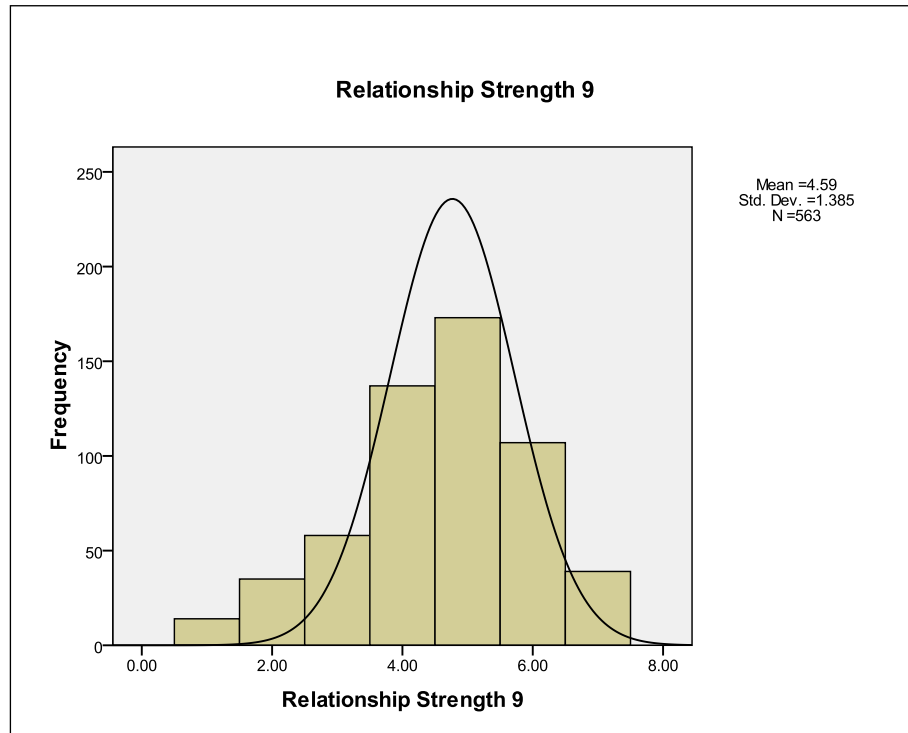
Appendix 8 Main study Normal distributions histogram plots for scale items

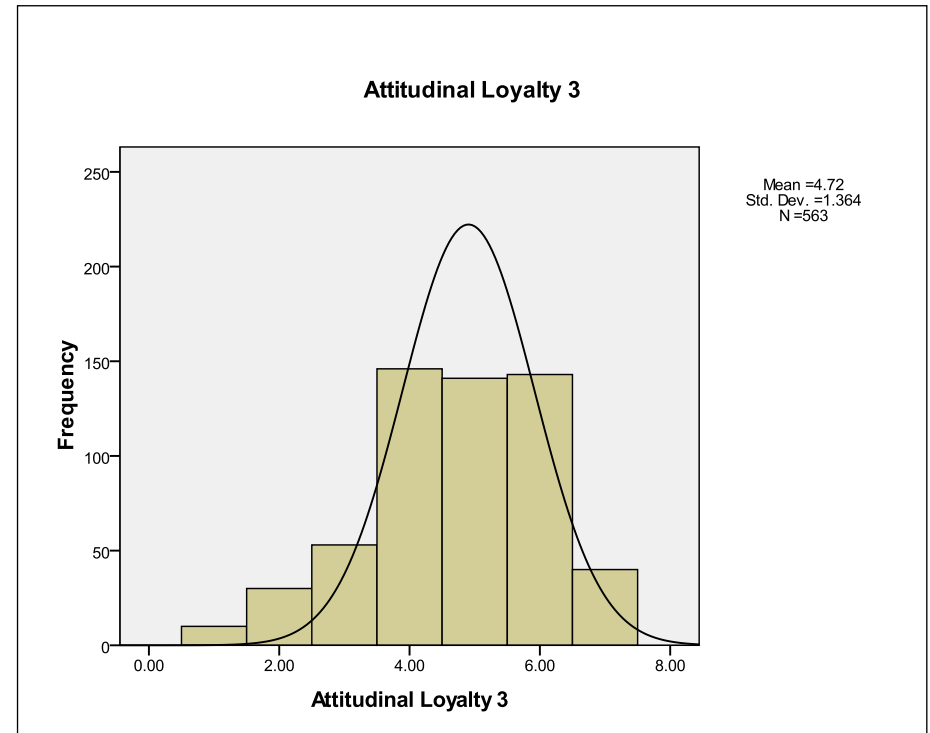
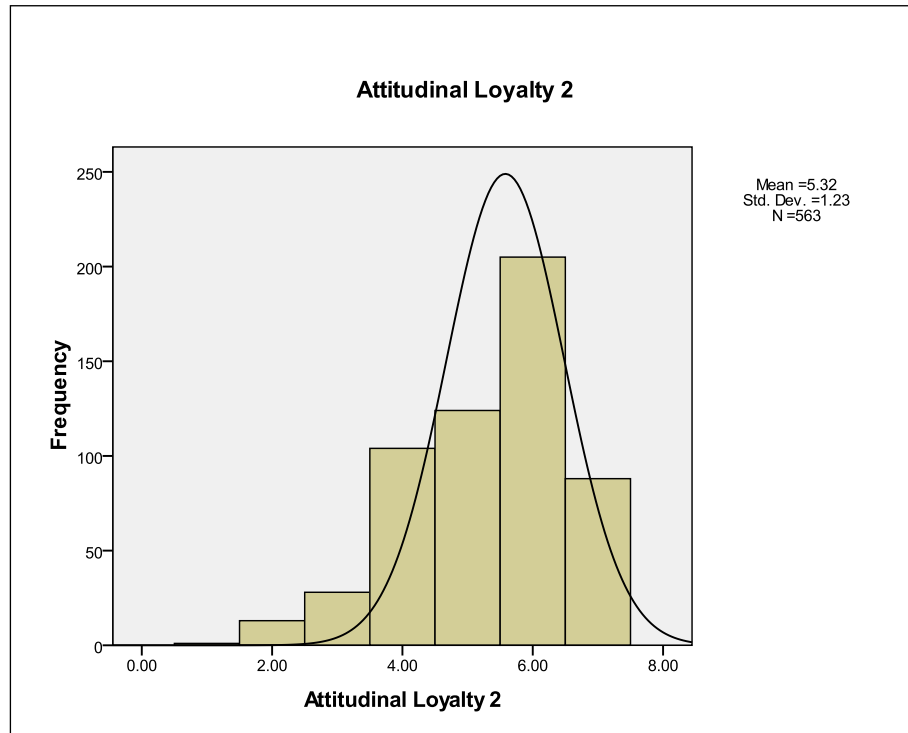


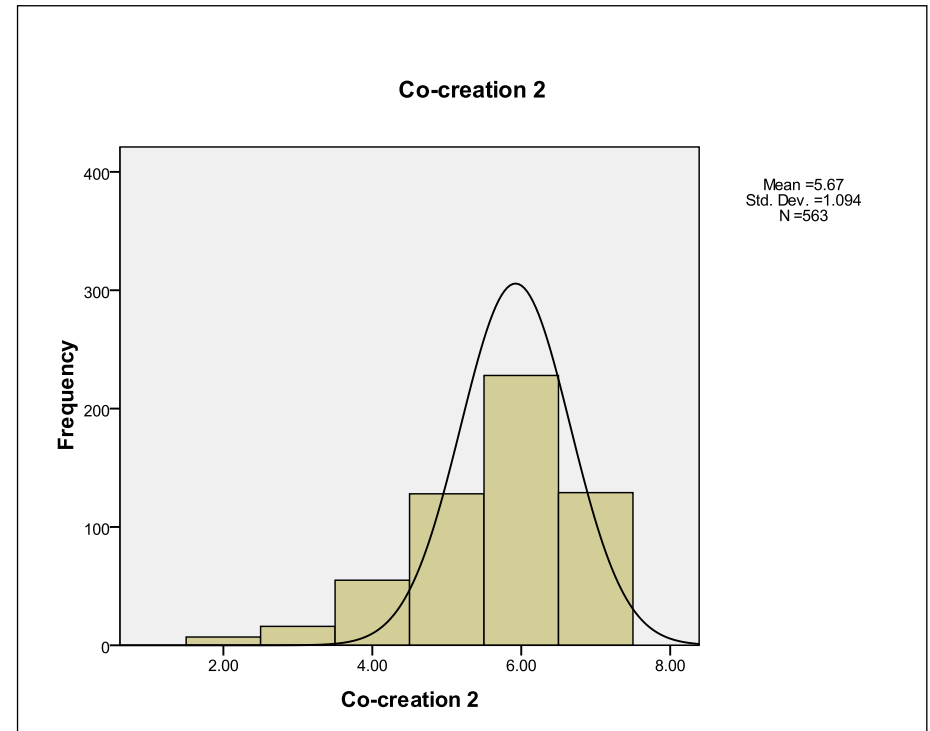
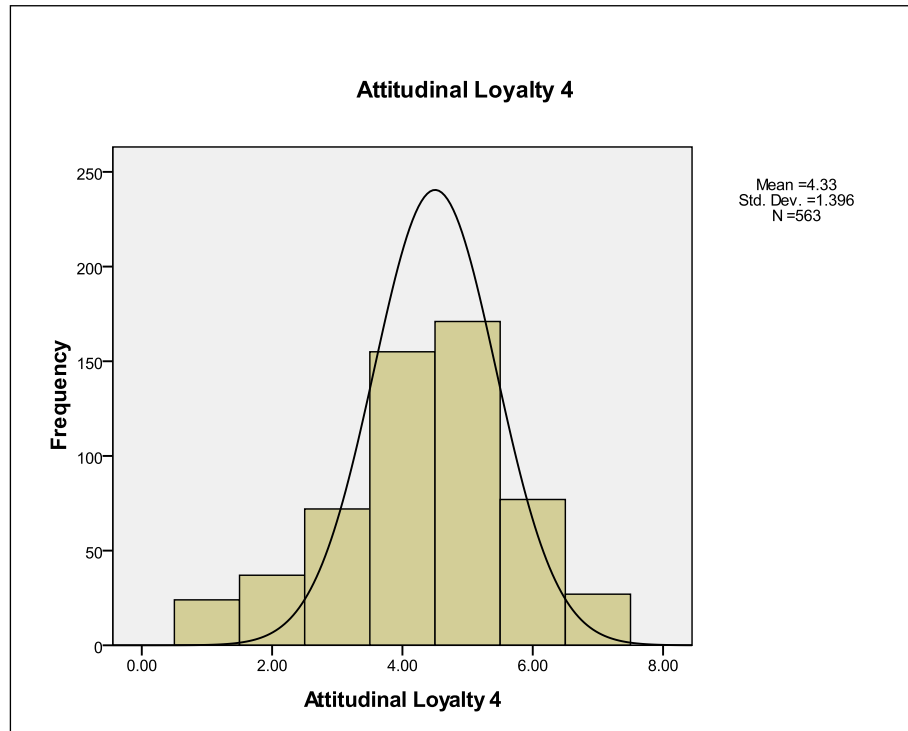


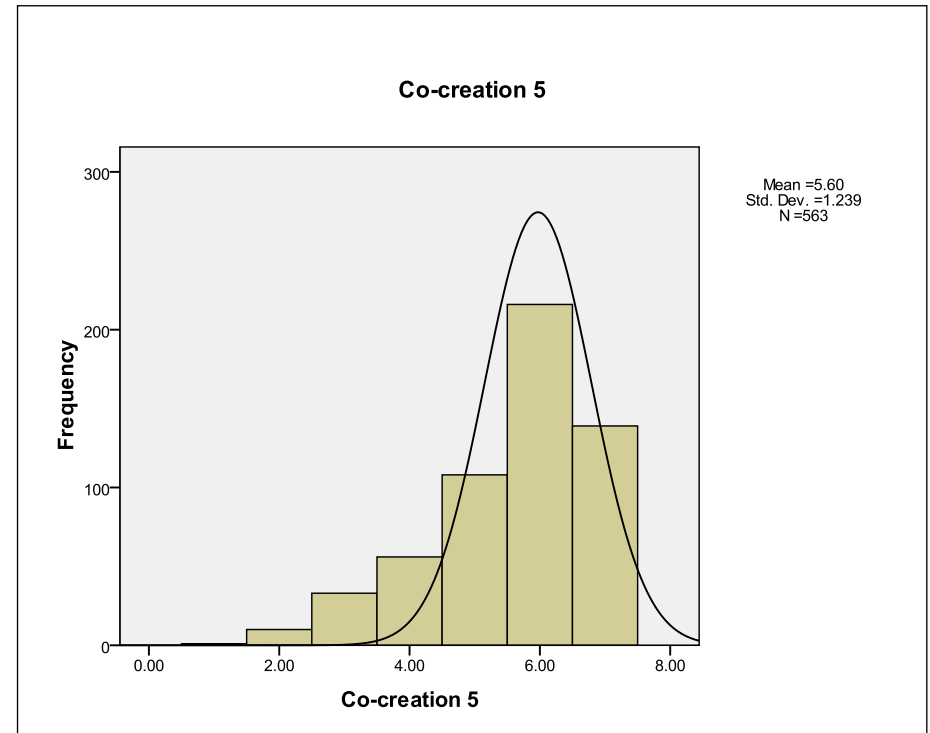
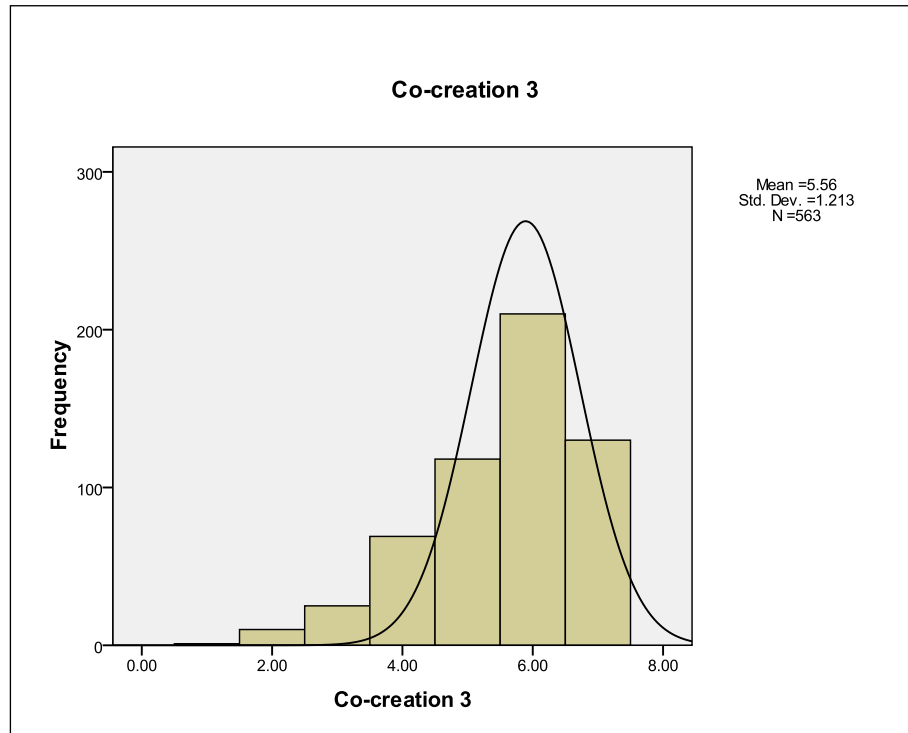




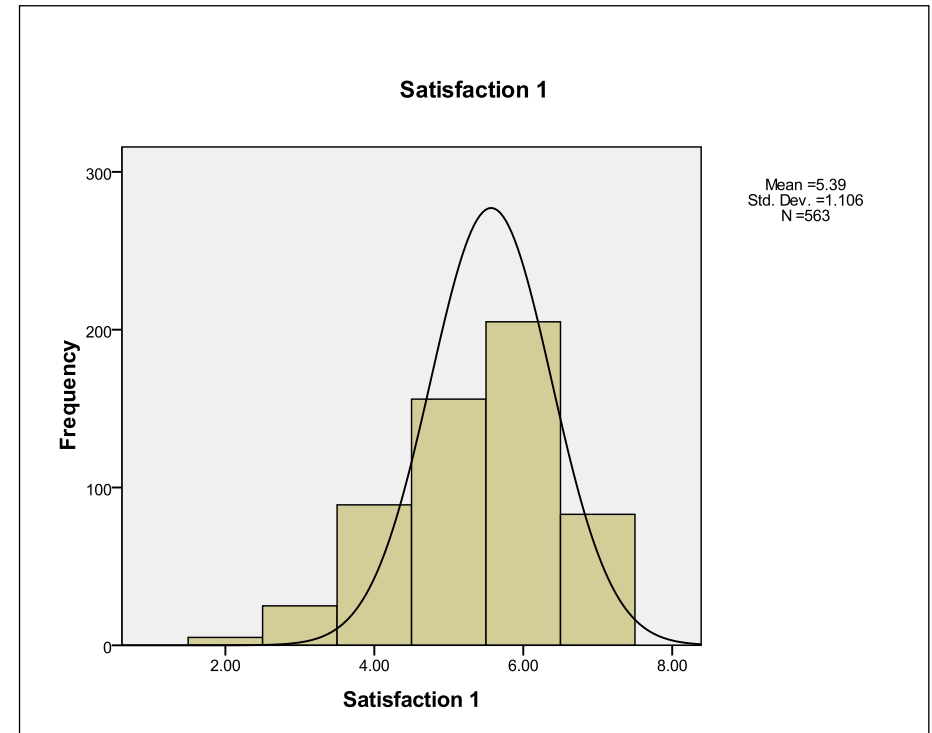
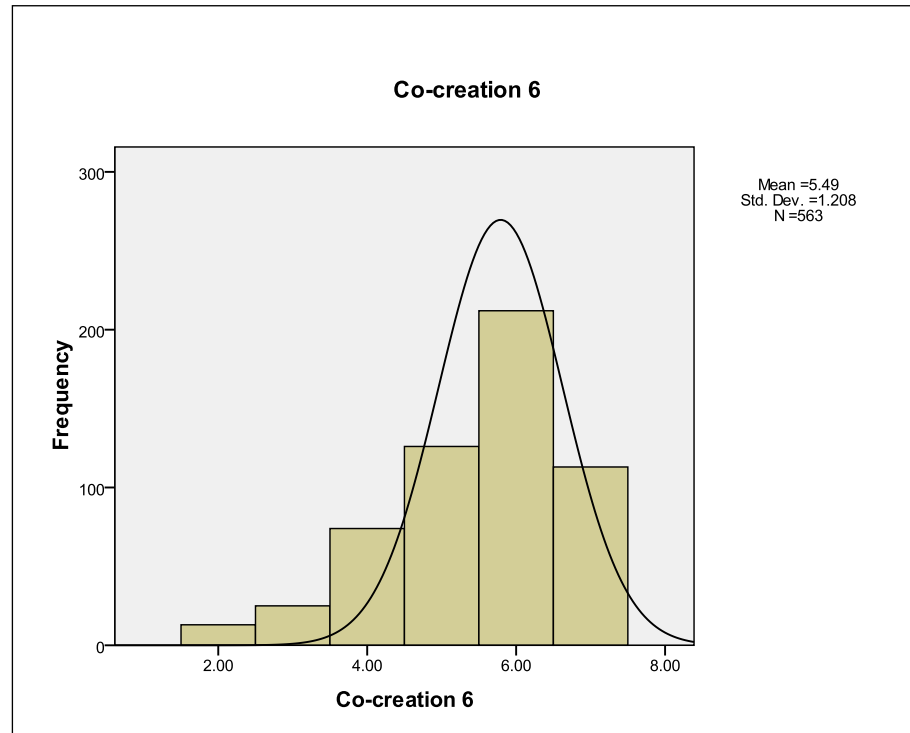


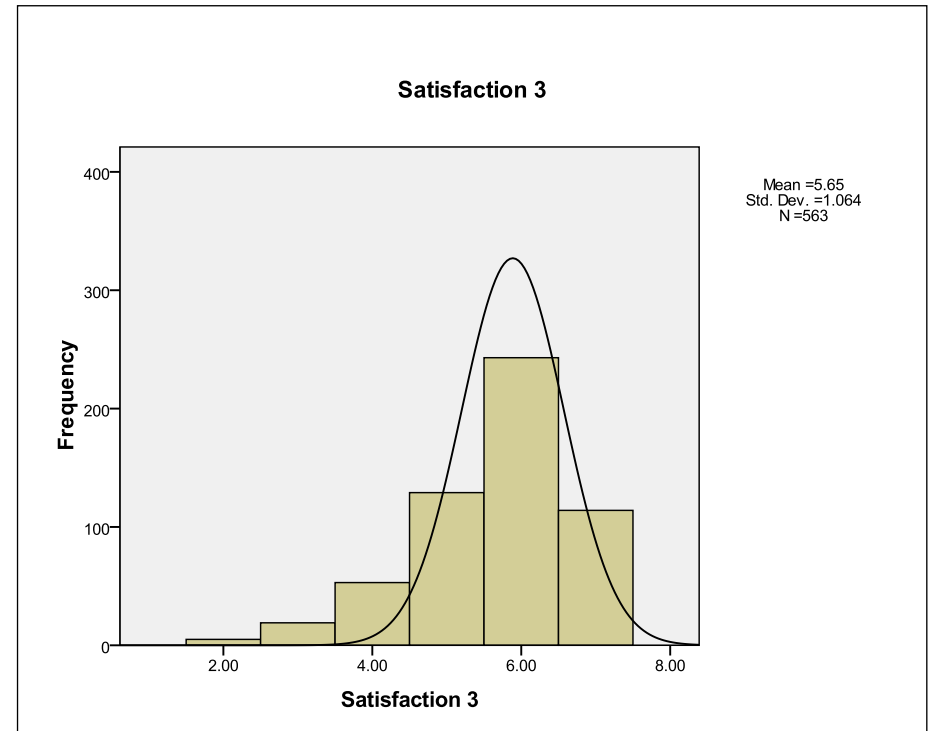
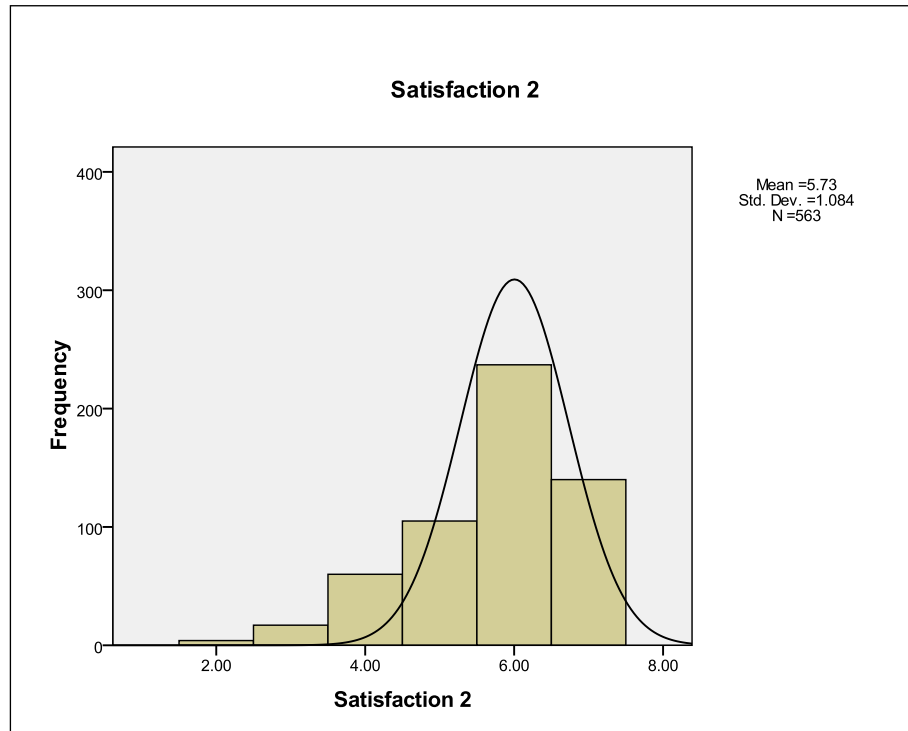












Appendix 9 Main study Z scores skewness and kurtosis for scale items

	Trust-1	Trust 2	Trust 3	Repurchase Intentions 1	Repurchase Intentions 2	Re-purchase Intentions 3	Re-purchase Intentions 4
N	561	561	561	561	561	561	561
Skewness	-.507	-.482	-.517	-.629	-.783	-.600	-.512
Std Error of Skewness	.103	.103	.103	.103	.103	.103	.103
Z Score Skewness	-4.93	-4.68	-5.03	-6.11	-7.60	-5.83	-4.97
Kurtosis	.049	-.038	.096	-.056	.288	-.071	-.265
Std Error of Kurtosis	.206	.206	.206	.206	.206	.206	.206
Z Score Kurtosis	0.237	-0.186	0.468	-0.274	1.403	-0.346	-1.291

	Attitudinal Loyalty 1	Attitudinal Loyalty 3	Attitudinal Loyalty 4	Co creation 2	Co-creation 3	Co-creation 5	Co-creation 6
N =	561	561	561	561	561	561	561
Skewness	-.447	-.463	-.406	-.869	-.851	-.940	-.786
Std Error of Skewness	.103	.103	.103	.103	.103	.103	.103
Z Score Skewness	-4.34	-4.49	-3.94	-8.44	-8.26	-9.13	-7.64
Kurtosis	-.132	-.151	-.040	.688	.401	.459	.238
Std Error of Kurtosis	.206	.206	.206	.206	.206	.206	.206
Z Score Kurtosis	-0.643	-0.735	-0.196	3.347	1.952	2.234	1.159

	Relationship Strength 7	Relationship Strength 8	Relationship Strength 9	Satisfaction 1	Satisfaction 2	Satisfaction 3
N	561	561	561	561	561	561
Skewness	-.368	-.507	-.450	-.504	-.859	-.854
Std Error of Skewness	.103	.103	.103	.103	.103	.103
Z Score Skewness	-3.58	-4.92	-4.37	-4.90	-8.34	-8.29
Kurtosis	-.381	-.116	-.063	-.142	.431	.657
Std Error of Kurtosis	.206	.206	.206	.206	.206	.206
Z Score Kurtosis	-1.856	-0.563	-0.307	-0.689	2.098	3.197

## Appendix 10 Main study Z Scores results to assess outliers in dataset

<b>Zscore: Trust-1</b>			
		Frequency	Percent
Valid	-2.9898	9	1.6
	-2.073	20	3.6
	-1.1562	107	19.0
	-0.2394	165	29.3
	0.67743	203	36.1
	1.59424	59	10.5
	Total	563	100.0

<b>Zscore: Trust 2</b>			
		Frequency	Percent
Valid	-3.5744	1	.2
	-2.7118	11	2.0
	-1.8492	31	5.5
	-0.9867	118	21.0
	-0.1241	160	28.4
	0.73847	186	33.0
	1.60104	56	9.9
	Total	563	100.0

<b>Zscore: Repurchase Intentions 1</b>			
		Frequency	Percent
Valid	-2.7004	15	2.7
	-1.8878	31	5.5
	-1.0753	89	15.8
	-0.2627	142	25.2
	0.54989	194	34.5
	1.36246	92	16.3
	Total	563	100.0

<b>Zscore: Repurchase Intentions 2</b>			
		Frequency	Percent
Valid	-3.6527	2	.4
	-2.8315	8	1.4
	-2.0102	32	5.7
	-1.1889	78	13.9
	-0.3676	122	21.7
	0.45367	216	38.4
	1.27496	105	18.7
	Total	563	100.0

<b>Zscore: Re-purchase Intentions 3</b>			
		Frequency	Percent
Valid	-3.4878	1	.2
	-2.6689	12	2.1
	-1.8501	36	6.4
	-1.0312	97	17.2
	-0.2124	140	24.9
	0.60651	199	35.3
	1.42537	78	13.9
	Total	563	100.0

<b>Zscore: Relationship Strength 7</b>			
		Frequency	Percent
Valid	-2.7313	4	.7
	-1.9689	41	7.3
	-1.2066	70	12.4
	-0.4442	127	22.6
	0.31823	177	31.4
	1.08061	117	20.8
	1.843	27	4.8
	Total	563	100.0

<b>Zscore: Relationship Strength 8</b>			
		Frequency	Percent
Valid	-2.6575	10	1.8
	-1.9481	40	7.1
	-1.2387	45	8.0
	-0.5292	120	21.3
	0.18019	174	30.9
	0.88961	121	21.5
	1.59903	53	9.4
	Total	563	100.0

<b>Zscore: Relationship Strength 9</b>			
		Frequency	Percent
Valid	-2.5946	14	2.5
	-1.8726	35	6.2
	-1.1505	58	10.3
	-0.4284	137	24.3
	0.29371	173	30.7
	1.01579	107	19.0
	1.73788	39	6.9
	Total	563	100.0

<b>Zscore: Attitudinal Loyalty 1</b>			
		Frequency	Percent
Valid	-2.5882	12	2.1
	-1.8519	43	7.6
	-1.1156	57	10.1
	-0.3793	144	25.6
	0.35704	173	30.7
	1.09334	106	18.8
	1.82965	28	5.0
	Total	563	100.0

<b>Zscore: Attitudinal Loyalty 3</b>			
		Frequency	Percent
Valid	-2.7249	10	1.8
	-1.9919	30	5.3
	-1.2589	53	9.4
	-0.526	146	25.9
	0.207	141	25.0
	0.93996	143	25.4
	1.67293	40	7.1
	Total	563	100.0

<b>Zscore: Attitudinal Loyalty 4</b>			
		Frequency	Percent
Valid	-2.3882	24	4.3
	-1.6719	37	6.6
	-0.9555	72	12.8
	-0.2392	155	27.5
	0.47713	171	30.4
	1.19347	77	13.7
	1.90981	27	4.8
	Total	563	100.0

<b>Zscore: Satisfaction 1</b>			
		Frequency	Percent
Valid	-3.0612	5	.9
	-2.157	25	4.4
	-1.2527	89	15.8
	-0.3485	156	27.7
	0.5557	205	36.4
	1.45993	83	14.7
	Total	563	100.0

<b>Zscore: Satisfaction 2</b>			
		Frequency	Percent
Valid	-3.4395	4	.7
	-2.5174	17	3.0
	-1.5953	60	10.7
	-0.6732	105	18.7
	0.24895	237	42.1
	1.17106	140	24.9
	Total	563	100.0

<b>Zscore: Satisfaction 3</b>			
		Frequency	Percent
Valid	-3.4285	5	.9
	-2.4888	19	3.4
	-1.549	53	9.4
	-0.6093	129	22.9
	0.3305	243	43.2
	1.27026	114	20.2
	Total	563	100.0

<b>Zscore: Co-creation 2</b>			
		Frequency	Percent
Valid	-3.357	7	1.2
	-2.4426	16	2.8
	-1.5283	55	9.8
	-0.6139	128	22.7
	0.30045	228	40.5
	1.21481	129	22.9
	Total	563	100.0

<b>Zscore: Co-creation 3</b>			
		Frequency	Percent
Valid	-3.7627	1	.2
	-2.9381	10	1.8
	-2.1135	25	4.4
	-1.2889	69	12.3
	-0.4643	118	21.0
	0.36031	210	37.3
	1.18491	130	23.1
	Total	563	100.0

<b>Zscore: Co-creation 5</b>			
		Frequency	Percent
Valid	-3.7122	1	.2
	-2.9053	10	1.8
	-2.0983	33	5.9
	-1.2914	56	9.9
	-0.4845	108	19.2
	0.32249	216	38.4
	1.12943	139	24.7
	Total	563	100.0

<b>Zscore: Co-creation 6</b>			
		Frequency	Percent
Valid	-2.8868	13	2.3
	-2.0593	25	4.4
	-1.2317	74	13.1
	-0.4042	126	22.4
	0.42332	212	37.7
	1.25085	113	20.1
	Total	563	100.0