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## **New product development and co-creation: a service-dominant logic approach**

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**Abstract:** Nowadays, we face competitive environments characterised by the proliferation of new technologies, accelerated obsolescence of products and constant change in consumer needs. Companies and organisations need to keep up with changes in the development of new products and services. Interaction with the consumer through co-creation in the new product development process emerges as a process to obtain a competitive advantage and create value for the consumer. Value creation is not inherent to new product development and co-creation. Motivational, emotional, and situational factors alter the success of value creation and can even destroy it. A survey was conducted to measure the variables and test the hypothesis. Results from multiple regression indicate a positive relation between co-creation, innovation, motivation, emotion, value creation, and information and new product development.

**Keywords:** new product development; cocreation; value creation; innovation.

**Reference** to this paper should be made as follows: Dias, Á., Pereira, L., da Costa, R.L. and Gonçalves, R. (2022) 'New product development and co-creation: a service-dominant logic approach', *Int. J. Entrepreneurial Venturing*, Vol. 14, No. 1, pp.87–121.

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## 1 Introduction

The development of new products is fundamental for companies and organisations, with the innovation inherent to the creation of strategies and mechanisms that allow creating products and/or services with the possibility of achieving a competitive advantage against the competition.

The involvement of the consumer in the processes of development of new products, is a theme recently approached by several authors, they affirm the co-creation can be an advantage for both the companies and the consumers involved in the processes. They create value for themselves and other consumers, as they can provide crucial *insights* for the success of co-created products and/or services.

As an example of authors addressing the topic, we have Prahalad and Ramaswamy (2004) who state that co-creation, in which the consumer co-creates an experience of value to him and other consumers' increases productivity and efficiency through minimising costs (Bowers et al., 1990).

Despite the advantages mentioned above with the involvement of the final consumer in the various development processes of new products, we can see that consumers are influenced by intrinsic and extrinsic factors and, according to Brockhoff, (1997) the integration of the consumer in the development of new products and services do not always have a positive influence on their success. This is because the success of new product development through co-creation depends mainly on a deep understanding of consumer needs (Hauser et al., 2006). The inability to meet these needs is the main cause of the failure of new products (Ogawa and Piller, 2006).

Value creation is the main objective on the launch of a new product on the market, this because, it is the value that the consumer perceives and receives from the company or organisation. The consumer, as co-creator, is influenced by cultural, motivational, emotional factors, among others that allow, or not, that add value to the product and the service with which it collaborated. According to Woodruff (1997), the consumer's assessment of what is perceived leads directly to the formatting of feelings of satisfaction, dissatisfaction or indifference. We can then see why many times the new products do not have the expected success. It is important to determine factors that influence the consumer as a co-creator of value in the development of new products, with each consumer being unique and individual and companies and organisations need to meet standards and processes for a greater success rate, from a B2C perspective.

Firms look daily for an advantage that differentiates them from their competitors. Co-creation emerges as a way to improve innovation and performance by taking advantage of consumers' knowledge and perception of their needs and those around them. This has led companies to seek to involve consumers in various stages of new product development (Fang, 2008; Gruner and Homburg, 2000).

However, client involvement in the development of new products is not always synonymous with success, and clients may be limited sources of innovation and creativity (Christensen, 1997; Christensen and Bower, 1996), or sometimes unable to articulate their latent needs (Franke et al., 2009). The main challenge is to reconcile the objectives inherent to each company and the interests of consumers (Hoyer et al., 2010). However, the main objective of this study is to ascertain the influence of co-creation in the development of new products and/or services. The co-creation processes, as discuss ahead, can influence new product development through several perspectives, which leads

to specific objectives of this study, such as to investigate the influence on new product development of:

- i innovation
- ii motivation
- iii value creation
- iv information.

The paper is divided into five sections. Section 2, a literature review of several authors is performed on the concepts related to product development, co-creation, value creation and destruction and the variables under study. Section 3 consists of the presentation of the methodology, detailing the questionnaire and the research methods, as well as the definition of the sample.

In Section 4 presents the results and discussion. To conclude, Section 5 addresses the conclusions reached, the implications for management and limitations and future investigations.

## **2 Theoretical background**

### *2.1 Essential concepts*

#### *2.1.1 New product development (NPD)*

New product development (NPD) is a collaborative process that includes involvement, experience and value creation (Lee et al., 2012). According to the study by Cooper and Kleinschmidt (1993), they define four aspects that positively influence the success of a new product: the clear definition of the product before its development, the preparatory details, the orientation of NPD towards market needs and, finally, NPD through a defined and structured process. For the authors, NPD's market orientation and client involvement is differentiated and co-creation does not influence NPD's success.

On the other hand, Yadav et al. (2007) state that companies tend to pay more attention to the future and, consequently, involve consumers in the various phases of the NPD process, the same phases can be, from the generation of ideas, where companies seek to know the needs related to knowledge and the potential of the new product, the development phase, where the co-creator can provide solutions, according to his vision of use (Coviello and Joseph, 2012), or, finally, in the testing phase, where the customer can test the prototypes in real situations.

Despite the potential for end-user involvement in NPD, according to Henard and Szymanski (2001), performance may vary according to evaluation or contextual factors. Cultures are diverse and dynamic social systems where, according to Freeman and Bordia (2001), individual and collective orientation depends on the references that each individual, at family, academic or national level. In this sense, consumer involvement can create situations of contradictory value for the different consumers to whom the new products and/or services are directed.

### 2.1.2 Co-creation

Value creation happens when consumers take an active role and create value together with the company or organisation through direct and indirect collaboration (Kohler et al., 2011). Prahalad and Ramaswamy (2004, p.80) state that, “the market tends to be a system where consumers play an active role in creating and competing for value.

Galvagno and Dalli (2014, p.644), define co-creation as the “joint, current and simulated process to create value, both materially and symbolically”. Frow et al. (2011, p.1), further define co-creation as “an interactive process involving at least two resources willing to integrate involved consumers in specific ways for mutually beneficial collaboration, resulting in the co-creation of value for the consumers in question. And on the other hand, Van Doorn et al. (2010), believe that co-creation occurs when the consumer participates only through spontaneous behaviour.

The *Service-Dominant* (S-D) logic considers that the client is always a co-creator of value (Lusch and Vargo, 2006). And according to Grönroos and Voima (2013) value creation is an ongoing process where co-creation occurs only in a joint sphere when two or more parties interact. Co-creation occurs in different contexts (Bolton and Saxena-Iyer, 2009), depending on the definition of value creation, the concept of co-creation involves different meanings. The cultural context is a critical factor in co-creation, according to Chandler and Vargo (2011), value is co-created through the dissemination of practices and the integration of resources, which are guided by social and collective norms.

According to the Consumer Culture Theory (TCC) (Arnould and Thompson, 2005), value co-creation is influenced according to three levels: *micro* (individual evaluation of the experience); *meso* (relational norms); *macro* (collective meanings).

The authors argue that the *meso* level analyses and explores systems of cultural production, while the *macro level* investigates the influences that cultural and economic globalisation exerts on consumer identity projects.

In another perspective, Grönroos (2011) believes that co-creation can only occur through direct interactions, if there are no direct interactions, no co-creation of value is possible. In contrast, Helkkula et al. (2012) argue that consumer interactions do not always need to be experienced in reality, they can exist through imagination or take on forms of indirect interactions. For the purposes of this stage report, we will adopt the S-D logic, in which the consumer is always co-creator of value.

### 2.1.3 Innovation

NPD and co-creation include several processes, participation through innovation is one of the most important processes, being considered a new paradigm in the field of value creation (Bugshan, 2015). Ahlstrom (2010) considers that an indicator of NPD's success is product or service innovation and Cooper (1993, 1996) states that abstention from innovation is an important explanation for NPD's failure. The link that the consumer creates with an innovative product provides strong feelings and perceptions about it (Phau et al., 2015). Authors say knowledge, information and process memory increase innovation (Nonaka, 1994), others say it reduces innovation (Moorman and Miner, 1998). Echeverri and Sklen (2011) emphasise that the value creation process in which the consumer and the company are involved can be a creative and successful process, but also a destructive one.

Hemphälä and Magnusson (2012) recognise that creativity and innovation is not an individual process, but rather a social and communication process in which networks and interactions can significantly influence the origin of ideas. Dias et al. (2020) states that creative work tends to be useful to some social group and, in this way, as argued by Stein (1953) social judgement is involved, he further states that a creative vision emerges from a reintegration of something already existing that combines with new elements and, finally, states that the impact will never be predictable, depending on the perception of the individual.

According to the business context, co-creation, in which consumers participate creatively in the production of content and innovation of products and services, can be considered an economic and cultural evolution, taking into account the access of consumers to the means of production through communication and information technologies (Lundvall and Johnson, 1994).

#### *2.1.4 Motivation*

Deci and Ryan (1985) with the theory of self-determination distinguish two types of motivation, intrinsic and extrinsic. Intrinsic, when it is something inherently interesting or pleasant. Extrinsic, when there is an outcome, motivated by factors such as resentment, resistance, disinterest or, alternatively, with an attitude of will that reflects an internal acceptance of the value or utility of a task.

Consumer involvement is a strategic imperative to improve corporate performance, such as sales growth (Neff, 2007), competitive advantage (Sedley, 2008) and profitability (Voyles, 2007). The consumers involved play an important role in NPD (Kothandaraman and Wilson, 2001; Hoyer et al., 2010) in co-creating an experience that translates into value creation (Prahalad and Ramaswamy 2004; Brakus et al., 2009).

According to Lusch and Vargo (2006), the central premise of *Service-Dominant Logic* (S-D) assumes that satisfaction and value tend to increase when the organisation and the consumer co-create the service offer. By increasing their involvement and motivation in the process, it provokes greater wisdom regarding the product/service, which leads to a relational orientation and greater sense of value.

In addition, Brodie et al. (2011), argue that the level of involvement of a consumer depends on the social, political and cultural context in which it is inserted. It is affected by individual, relational, collective (Epp and Price, 2011), contextual and social objectives (Chandler and Vargo, 2011; Edvardsson et al., 2011).

#### *2.1.5 Emotion*

Mehrabian and Russell (1974) propose the S-O-R model, which highlights the response of the organism-stimulus. This means that the sensory inputs of the external environment, the stimulus, combined with internal factors, trigger emotional states, the organism, from which result behavioural reactions, the response. The response appears finally, as a result or final action, translated into consumption behaviours (Bagozzi et al., 1999; Sherman et al., 1997).

Patterson et al. (2006), Mollen and Wilson (2010) and Hollebeek (2011) define consumer involvement in NPD in terms of a psychological state. Bowden (2009), observes it as a psychological process, which drives consumer loyalty. On the other hand,

Vivek et al. (2012), analyse it through a behavioural perspective, with cognitive and emotional dimensions.

Patterson et al. (2006) propose four components of consumer involvement:

- i the level of concentration of the consumer
- ii dedication, the sense of belonging to the organisation/brand, which corresponds to the emotional dimension of involvement
- iii vigor, the level of energy and mental resilience of the consumer when interacting
- iv interaction, communication between the surrounding parties.

There are thus three dimensions that can translate internal emotional states, which means that they describe the affective response to external stimuli: pleasure, satisfaction of an affective experience (Kaltcheva and Weitz, 2006), excitement, capacity for activation inherent in a stimulus (Rojas and Camarero, 2006) and dominance, the degree to which the individual feels influential (Liao et al., 2011). The combination of states of pleasure, excitement and dominance results in distinct behaviours.

The individual may choose one of two types of behaviour: approach or avoidance (Liao et al., 2011). Approach behaviours include positive behaviours in relation to an environment, that is, the desire to stay, explore, work and relate. Avoidance behaviours reflect the opposite situation, which is the desire to avoid staying, exploring, working and relating (Bitner, 1992). Emotions have a significant impact on the success of NPD, the behaviour of consumers is characterised based on sentimental guidelines, within the polarity of emotions, from positive to negative.

### 2.1.6 Value creation

The creation of value for the consumer, is what the consumer holds (benefits) in relation to what he abdicates (cost or sacrifice) (Zeithaml, 1988). Butz et al. (1996) add that it results from an attitude or an emotional connection with the product/service. Anticipation of consumer value refers to a company's "ability to observe what consumers will value, including the product and service offerings" (Flint et al., 2011, p.219). Woodruff (1997) defines as preference of perceived value and evaluated by attributes, performance and the consequences resulting from the use that facilitates (or blocks) the achievement of the objectives and purposes of the client in situations of use.

According to Woodall (2003), value creation has two dominant factors, value creation for the consumer (perceived and received value) and value creation for the organisation that provides the product/service (value life cycle). In short, the concept of value for the client foresees customer satisfaction as a key result. Specifically, customer value structures suggest that assessing customers for the value they perceive of a given product or service can lead directly to feelings of satisfaction or dissatisfaction (Churchill and Surprenant, 1982; Woodruff and Gardial, 1996; Woodruff, 1997).

Holbrook (2005, p.46) states that value creation for the consumer is "interactive and relative". Each consumer has an individual, conditional and contextual, relative and dynamic perception of it (Ulaga, 2003). For the purposes of the current dissertation we have adopted the definition of Holbrook (2005), because the creation of value is complex and varies according to numerous intrinsic and extrinsic factors.

### 2.1.7 *Information*

Sharing information with the consumer is basic, this shared knowledge or sharing of information is an extension of understanding the needs of current customers with the future creation of value for the consumer (Calantone et al., 1996; Narver and Slater, 1990). Shared knowledge is a valuable and fundamental resource to achieve a competitive advantage (Nonaka and Takeuchi, 1995). An important element in NPD is the use of market information (Moorman, 1995; Ottum and Moore, 1997). This information refers to the future needs of consumers and external factors such as competition (Moorman et al., 1993).

The information associated with the constant evolution and the technological needs of the market can decrease costs, time and risk of failure (Ottum and Moore, 1997). Moreover, information regarding past and current efforts improves the effectiveness of NPD (Kontoghiorghes et al., 2005). No less important is the information on the part of the client, the same being a key factor for NPD (Urban and Hippel, 1988; Svendsen et al., 2011), access to this information allows the company to develop products/services that provide a superior value proposition (Svendsen et al., 2011). Ottum and Moore (1997), on the other hand, state that collecting and sharing information may be important, but only if the information is used successfully.

### 2.1.8 *Experience*

Initially, the experience was only at the moment of the decision, where the consumer responded to something that was offered (Grewal and Levy, 2007; Kotler, 1974). Zeithaml (1988), defines the client's experience as a perceived judgement about its excellence or superiority. According to Raghurir and Corfman (1999), the consumer experience depends on individual goals and what the supplier has to offer, according to the assignment theory. Schmitt (1999) has countless five main drivers of the consumer experience: emotional, sensory, cognitive, relational and behavioural value.

Meyer and Schwager (2007), define the client's experience as internal and subjective, in response to any direct or indirect contact with the company. Gentile et al. (2007), argue that the customer experience is based on a set of interactions between a client and a product, a company or part of the organisation, which provokes a reaction. This experience is strictly personal and implies that the client is involved at different levels Kim et al., (2006) proposed a holistic model, with four main components of a consumer purchasing process:

- i expectations and perceptions of service quality
- ii consumer experience with the company
- iii value
- iv satisfaction.

For many years the experience was adjusted to the concept of service quality, but according to Payne et al. (2008), the experience of consumption is distinct from the judgement of service quality, it judges the processes of the company and not the consumer. Consumer experience encompasses "total experience, including research, purchasing, consumption and after-sales" (Verhoef et al., 2009).



Vehoef et al. (2009), describe the experience as cognitive involvement, affective, social and physical responses to the supplier, for which it is imperative that the supplier becomes aware of the dimensions of the consumer experience as a construct. On the other hand, Grewal et al. (2009) are focused on behavioural outcomes such as retention, cross-purchasing and word-of-mouth. In addition, Voss et al. (2008) state that the value perceived by the customer is derived from goods, services and other experience factors in relation to expectations. Payne et al. (2008) adds the learning side of the client, what is provided and leads the client to reflect on how the value proposition relates to their life, goals and aspirations.

### 2.1.9 Segmentation

The target market concept defines that consumers must be identified for whom supply must be 'right' and for whom the company/organisation directs most of the marketing, time, resources and attention (Duboff, 1992).

Weinstein (1994, p.3) defines the term segmentation as, "the key to successful marketing". Companies need to group customers into the most profitable segments for them, in order to provide consumers with certain appropriate segments, which make it possible to communicate with them through an appropriate language. In addition, Yavitz and Newman (1982) argue that the right segment and the right offering translate the most effective metrics into developing a competitive advantage. More recent authors validate previous theories and claim that gender, age and education have significant effects on the dimensions of quality of service (Buddha et al., 2006).

## 2.2 Research model and hypothesis

The development of a new product or service is an extremely complex process, which involves the interaction of numerous parts in an unconventional way (Açıkgöz et al., 2014). Today, according to Gemser and Perks (2015), consumers are increasingly willing to learn, share and create experiences. They demand more and more opportunities for creative involvement, through participation in NPD and involvement with companies or organisations in general.

To keep up with this need, companies are increasing their resources and capabilities to anticipate innovation and constant change (Shepherd et al., 2017). However, in the traditional market, it is complex for consumers to participate and engage in the development of new products that meet real needs, which is why the success rate of new products is usually low.

Saarijärvi et al. (2013) state that 'value', 'co' and 'creation' can refer to different types of value, both for the company and the consumer, through different processes and with different stakeholders. The reciprocal influence between co-creator and company emphasises 'co' in co-creation and highlights the need for multiple contributions to develop new products, both directly and indirectly (France et al., 2015).

For Chang and Taylor (2016) co-creation with consumers in the early stages of NPD provides information and diverse perspectives. According to the authors, the value of co-creation decreases during the more technical development stage and increases in marketing, where consumers provide *feedback* on market positioning and product use. Hilton et al. (2012) distinguish phases of co-creation, from resource contributions to value propositions, which results in the integration and modification of resources. It also

states that co-creators assume different functions during the co-creation process with the objective of achieving mutual value, as previously mentioned by other authors.

Creating value for the consumer means that companies are meeting their needs, such as quality, delivery and product expectations (Simpson et al., 2014). Customer value through co-creation is related to social benefits such as a sense of belonging to a community (Nambisan and Baron, 2009), personal benefits such as a sense of personal fulfilment, affective benefits such as pleasure and satisfaction in the process (Franke and Schreier, 2010), or cognitive benefits by improving products that fit the needs of consumers (Franke et al., 2006).

For Kohler and Nickel (2017) the sustained participation of co-creators is a key factor in the success of the new product development process, the motivation affects the initial decision to participate and the experience of it. The experience is currently focused on emotional, subjective, and temporal aspects of consumer interaction for the benefit of the overall experience (Lallemand et al., 2015). For Kieffer and Mottola (2017) it is necessary to contextualise the experience based on real environments and technological interactions. We can observe the complexity of human interactions, due to the fact that they are multidimensional and differ according to the context in which they occur (Youngman and Hadzikadic, 2014). In this context, it is important to state that value creation is not a linear process, processes of co-creation of value can take different forms and levels of participation and involvement (Wolfson, 2016).

Künzli et al. (2016) states that each co-creator participates in value creation at different spatial scales and time settings. Consumer behaviour refers to consumer involvement in the production and delivery of services (Cossio-Silva et al., 2015). In short, co-created value is unique, experiential and contextually created by consumers on creative platforms (Grönroos and Gummerus, 2014).

We can affirm that technology has a determining role in transforming the way companies and consumers interact (Flores and Vasquez-Parraga, 2015). Chesbrough (2007) argues that co-creation arises due to the coincidence of several developments, such as the widespread adoption of technologies, the orientation of products and services towards experiences, the openness to innovation and the growth of social technologies, including customisation.

According to several authors mentioned above, co-creation through an interactive process enables creation and competition for value to the final consumer. Organisations need to be constantly changing to meet the needs of the modern consumer and leave the traditional vision, with the focus on the company to the consumer (Prahalad and Ramaswamy, 2004; Sashi, 2012). According to the above statements, the first hypothesis follows:

*H1: The greater the co-creation, the greater the development of new products.*

As stated in the literature review, innovation is considered the new paradigm for value creation (Bugshan, 2015). Innovative products and services have higher success rates and can lead to a higher level of return on investment (Leinschmidt and Cooper, 1991). The degree of innovation of a product can positively influence the value to the end consumer (Zhang et al., 2013). We can also verify that, for Cooper (1993, 1996) the abstention of innovation is an important explanation for the failure of NPD. According to the above statements, the second hypothesis follows:

*H2: The greater the innovation, the greater the development of new products.*

As previously mentioned, strategic involvement is a strategic imperative that provides a competitive advantage (Sedley, 2008). Thus, motivated and involved consumers play a key role in NPD (Kothandaraman and Wilson, 2001; Nambisan, 2008; Hoyer et al., 2010). According to the above statements, the third hypothesis follows:

*H3: The greater the motivation, the greater the development of new products.*

According to several authors, the relationship between NPD and the consumer happens through a psychological process (Browden, 2009), the same drives customer loyalty. It also happens through a behavioural process, related to the cognitive and emotional dimensions of the consumer (Vivek et al., 2010). We can thus state that emotions have a significant impact on consumer behaviour and performance as a co-creator of value, based on sentimental guidelines, from positive to negative.

Berry and Carbone (2007) state that an organisation needs to create a cohesive, authentic and sensory consumer experience. It is essential to please the consumer and differentiate the organisation by building an emotional connection with customers. According to the above statements, the fourth hypothesis follows:

*H4: The greater the emotion, the greater the development of new products.*

The creation of value for the consumer, is in accordance with value structures that the consumer perceives about a certain product or service. According to Holbrook (2005), the value for the consumer is interactive, relative, preferential and experiential; this is because each individual has his perception about the service or the product.

It can also be noted that co-creation and consumer involvement as a co-creator of value increases the competitive advantage of a company or organisation and creates value for the co-creator himself as well as for those around him. According to the above statements, the fifth hypothesis follows:

*H5: The greater the creation of value, the greater the development of new products.*

In addition to value creation, inherent to all forms of NPD and co-creation of value, information and knowledge sharing is equally fundamental to NPD and its success, and is also considered a competitive advantage for companies and organisations (Prahalad and Hamel, 1990; Nonaka and Takeuchi, 1995). According to Svendsen et al. (2011) the information provided by the consumer allows a superior value proposition to be developed for them. According to the above statements, the sixth hypothesis follows:

*H6: The greater the information, the greater the development of new products.*

As previously mentioned, and according to Verhoef et al. (2009), the consumer experience encompasses the total experience, from research, consumption and after-sales. Schmitt (1999) defines some strategic experiential contexts:

- i sensory, stimulate the senses of the consumer
- ii affective, appeal to emotions and feelings
- iii cognitive, stimulate the intellect and creativity
- iv physics, putting consumers in touch with new behaviours and lifestyles
- v social, work on consumer identification with other cultures and ethnic groups.

According to the above statements, the seventh hypothesis follows:

*H7: The greater the experience, the greater the development of new products.*

### **3 Methodology**

#### *3.1 Procedures and research design*

The objective of this study, in a first phase, was a literature review/analysis on the concept of new product development and the concepts of the hypotheses: co-creation, innovation, motivation, emotion, value creation, information and experience.

In the second phase, a questionnaire was prepared based on several models and several authors adapted to the context of the respondents to which they referred. With the questionnaire, it is possible to evaluate the subject of the study and, with this, analyse to what extent the hypotheses influence the development of new products.

#### *3.2 Sample*

This study used a non-probabilistic convenience sample through the *Snowball* method, or possible to observe all the elements of a given population. A total of 181 valid answers were obtained. Regarding the age of the individuals we obtained a percentage of 1.6% of participants under 18 years old, 20.3% between 18 and 40 years old, 77.5% between 41 and 65 years old and, finally, 0.5% over 65 years old. 43% of the respondents were male and 57% were female. Concerning education, 28% of the participants concluded secondary school, 50.5% graduated, 13.7% master's, 4.9% post-graduated and 2.7% other degree of education.

#### *3.3 Measures*

A questionnaire based survey was conducted with a total of 31 questions. The questionnaire was designed to include items that would allow the collection of all necessary information to analyse each variable under research. Thus, it was divided into several parts. It begins with a brief introduction on the subject to the respondents. In the first part we have three questions regarding Age, Gender and Education. The second part is composed by 28 questions about the subject. All questions are closed and must be answered.

The questions were divided into eight subparts, each part corresponding to each hypothesis of the conceptual model. The questions are positioned on the Likert scale according to the following degree of agreement, ranging from 1 = 'I totally disagree' from 5 = 'I totally agree'. The items were based on existing measurement scales with different sources, present in the Literature Review and summarised in Table 1.

The clarity of writing was inherent in the creation of the questionnaire, allowing everyone to answer it easily and quickly. After that, a pre-test was done, sending it to two selected people so they could answer and evaluate it before starting the survey. With this, it was possible to analyse if the different participants could clearly understand the statements. In this way, it was feasible to test whether there were no questions that respondents were reluctant to answer or whether there were questions that needed to be rephrased (Mooi and Sarstedt, 2011). The notes were carefully studied and the necessary

corrections introduced, such as the introduction of a mark that exemplifies the intended context, namely IKEA. The survey was created through *Google Forms*, a platform that allows creating and sharing surveys. There were 181 confirmed answers to the questionnaire.

**Table 1** Measure sources

<i>Variables</i>	<i>Authors</i>
New product development	Adapted from Zhang et al. (2016)
Cocreation	Adapted from Füller (2006)
Innovation	Adapted from Fernandes and Remelhe (2016)
Motivation	Adapted from Pelletier et al. (1997)
Emotion	Adapted from Grisseman and Stokburger-Sauer (2012)
Value Creation	Adapted from Ranjan and Read (2016)
Information	Adapted from Brünink (2013)
Experience	Adapted from Ranjan and Read (2016)

## 4 Results and discussion

This chapter presents the results of the descriptive analysis performed through the SPSS software. Thus, the results of the tables and graphs obtained with the 181 completed questionnaires will be presented and analysed.

### 4.1 Descriptive statistics and correlations

#### 4.1.1 Reliability

The Cronbach alpha coefficient, determined by Cronbach (1951), allows delimiting the reliability of a questionnaire. With it, it is possible to determine the lower limit of the internal consistency of a group of variables, that is, it indicates how closely a set of items is related. It varies between 0 and 1, and the values must be greater than 0.7 for consistency to be reasonable and greater than 0.9 for consistency to be very good.

##### 4.1.1.1 New product development

Four questions on New Product Development were presented in the questionnaire, which are listed in the following table. We can see that the consistency of the variable is 0.762, a value higher than 0.7, so it translates into a reasonable consistency.

##### 4.1.1.2 Co-creation

In the case of the co-creation variable, questions from 5 to 8 of the questionnaire were used, we can verify, in the following table, that the Cronbach's Alpha is 0.812, which demonstrates a good consistency.

#### *4.1.1.3 Innovation*

The innovation variable is shown in questions 9 to 12 of the questionnaire, the Cronbach Alpha with the value of 0.911, which allows us to state that the consistency of this variable is very good.

#### *4.1.1.4 Motivation*

According to Alfa de Cronbach regarding the motivation variable, in questions 13 to 16 of the questionnaire, we can identify that the value of 0.922 translates a very good consistency. In addition, it reflects the highest consistency value in parallel to the other variables under study.

#### *4.1.1.5 Emotion*

The Alpha of Cronbach of the emotion variable, refers to questions 17 and 18 of the questionnaire, with the value, 0.788, we can observe that the consistency of the variable is reasonable.

#### *4.1.1.6 Value Creation*

The value creation variable, refers to the variable with more items in the questionnaire, ranging from questions 19 to 23, with the value of Alpha de Cronbach, 0.791, it is possible to identify that the consistency is reasonable.

#### *4.1.1.7 Information*

According to Alfa de Cronbach, with the value of 0.808, relative to the information variable, between questions 24 and 26 of the questionnaire, a good consistency of the variable can be observed.

#### *4.1.1.8 Experience*

Finally, the experience variable, patent in questions 27 and 28 of the questionnaire, demonstrates an Alpha of Cronbach with the value of 0.876, which reveals a good consistency of the variable.

### *4.1.2 Averages, standard deviation and frequencies*

In the following subsection, and with the support of Table 2, we can observe the data obtained through the SPSS software, regarding the minimum and maximum, and mainly the mean and standard deviation of the variables, in relation to the Likert scale used in the questionnaire.

We can thus note the variable motivation has the highest average, with a value of 4.533. In this sense we can state that the motivational factor, namely the involvement in the task, the satisfaction patent and knowledge about personal capabilities, actively influences the development of new products, from the perspective of the co-creator.

**Table 2** Mean and standard deviation of the variables

	<i>Minimum</i>	<i>Maximum</i>	<i>Average</i>	<i>Standard deviation</i>
New product development	3.00	5.00	4.379	0.5418
Cocreation	2.75	5.00	4.048	0.6050
Innovation	3.00	5.00	4.463	0.5293
Motivation	3.00	5.00	<b>4.533</b>	0.4926
Emotion	1.50	5.00	4.337	0.6622
Value Creation	2.80	5.00	3.999	0.4897
Information	2.33	5.00	4.306	0.5868
Experience	1.50	5.00	<b>3.903</b>	0.7511

On the other hand, the lowest average before the group of variables refers to experience, with the value of 3.903, although the value is high, we can relate this lower value with the subjectivity of the variable. This result goes according to the model (S-D) that states that the creation of value is a process that involves the consumer as co-creator of value. And adds, that the focus is not the object of consumption, but the experience of it (Lusch and Vago, 2006). The experience is thus influenced moderately by the nature of participation and the relationship and the positive or negative effect that the consumer absorbs during it.

Besides the analysed averages, we can observe that the values in the other variables of the questionnaire are homogeneous, with values close to 4, which demonstrates a positive influence on the development of new products.

Regarding the standard deviation, the values vary between 0.4897 and 0.7511, which reflects that the data do not deviate much from the mean values and a uniformity of the variables.

## 4.2 Hypothesis test

### 4.2.1 Pearson correlations

Table A1 allows analysing the correlation of the variables under study, we can conclude that the variables described have a correlation between them. The coefficient of the variables is between 0 and 1, and the closer to 0, the weaker the degree of correlation and the closer to 1, the stronger the degree of correlation.

We can observe that the correlation coefficient between the variables oscillates between the values of 0.132 and 0.570. Regarding the weakest correlation verified in the study, between the innovation and experience variable and, the strongest correlation between the motivation and emotion variables. When analysing the table, we conclude that the variables tend to have low correlation coefficients and, consequently, weak to moderate correlations.

In addition, the significance level is statistically positive, significant at the 0.01 level, with the exception of the correlation between the variables, development of new products and experience, with a significance level at the 0.05 level, and the correlation between the innovation and experience variables, with no significance level between them. We can thus confirm the hypotheses regarding the linear correlation between the variables. Thus,

with 95% confidence, we reject  $H_0$  and can affirm that there is a linear correlation between the variables.

#### 4.2.2 *Multiple linear regression*

In the following table, we can check a multiple linear regression test through the ANOVA test (Table A2). This test relates the variables of co-creation, innovation and motivation. We verify that the significance level of the regression is less than 0.05 ( $P = 0.000$ ), so we reject the null hypothesis and conclude that  $H_1$ ,  $H_2$  and  $H_3$  are validated for the study in question.

By examining Table A3, we can verify that the variables, co-creation and innovation, are significant for the dependent variable (NPD), because the significance value when performing multiple linear regression of the two variables is less than 0.05. When introducing the motivation variable, we verify that the co-creation variable reveals a significance value of 0.057, higher than 0.05, that is, when we gather the three variables, the co-creation variable is no longer significant for the explanation of the NPD. Based on the non-standardised coefficient of B, for each extra value of the variables, the value of NPD. We can also verify through the Beta value, that the variable that most influences the development of new products is the innovation, with the value of 0.316. It is possible to verify, that co-creation and innovation, together, positively influence NPD.

In Table A4, we verify the degree of significance of the multiple linear regression through the ANOVA test regarding variables, emotion, value creation and information. We can conclude that the significance level associated with the test is less than 0.05 ( $P = 0.000$ ), so we reject the null hypothesis and validate the alternative hypothesis, which states that the hypotheses  $H_4$ ,  $H_5$  and  $H_6$  are validated.

Table A5, concerning the coefficient of variables, emotion, value creation and information. It is thus possible to state that they are significant in explaining the dependent variable, due to the significance value being less than 0.05. Based on the coefficient of B, for each extra value of the variables presented, the value of the dependent variable will increase. We can also verify through the coefficient of Beta, that the variable with greater influence is the creation of value, with the value of 0.333. In short, the variables described above, when grouped, through the sequence previously mentioned, positively influence the NPD.

By examining the following table, we determine the degree of significance through an ANOVA test, referring to variables, innovation, information and experience (Table A6). The test reflects that the significance level is less than 0.05, so we reject the null hypothesis and validate the alternative hypothesis, which indicates that the hypotheses  $H_2$ ,  $H_6$  and  $H_7$  are valid.

Table A7 portrays the multiple linear regression coefficients between variables, innovation, information and experience. They influence the dependent variable, with the exception of the experience variable, because the significance value is 0.762, higher than 0.05. With this, we can affirm that the variables, innovation and information are significant in explaining the NPD variable, on the other hand, when introducing the experience variable, this no longer happens. Thus, we can observe that the fact that experience is a subjective variable influences the dependent variable differently, which goes according to Holbrook (2005) which states that each consumer has an individual, conditional, contextual and relative perception of value creation. Based on the non-standardised coefficient B, we identify that for each extra value of each of the variables



the dependent variable increases and, according to the standardised value of Beta, the variable with greater influence is the innovation variable, with the value of 0.371.

In Table A8, we analyse the degree of significance through an ANOVA test, referring to variables, co-creation, innovation and value creation. The test reflects that the significance level is less than 0.05, so we reject the null hypothesis and validate the alternative hypothesis, which indicates that hypotheses H1, H2 and H5 are valid.

In Table A9 regarding the multiple linear regression coefficients, among the variables co-creation, innovation and value creation. The co-creation and innovation variables together influence the dependent variable because the significance value is less than 0.05. When introducing the value creation variable into the regression, the co-creation variable increases its degree of significance to the value of 0.077, higher than 0.05, that is, they, together, are not significant when elucidating the dependent variable. This refutes the logic (S-D) of Vargo and Lusch (2006), which state that value creation happens when the consumer becomes involved as a co-creator of value. In addition, through the value of the non-standardised coefficient of B, for each extra value of each variable, the value of the dependent variable increases and, according to the value of Beta, the variable with more influence is the innovation.

With Table A10, we determine the degree of significance through an ANOVA test, referring to variables, experience, value creation and emotion. The test reflects that the significance level is less than 0.05, so we reject the null hypothesis and validate the alternative hypothesis, which indicates that the hypotheses H7, H5 and H4 are valid.

In Table A11, concerning the multiple linear regression coefficients of the variables, experience, value creation and emotion, we observe that when combining the experience and value creation variables, the degree of significance is greater than 0.05 in the experience variable, with a value of 0.651, with which, we verify that they are not significant, together, for the explanation of the dependent variable. When introducing the emotion variable, the same scenario is observed, and together they are not significant for the explanation of the NPD. Regarding the non-standardised coefficient of B, the experience variable negatively influences the development of new products, and for each extra value of the experience, the value of the independent variable decreases by  $-0.025$ , when together with the value creation variable, when introducing the emotion variable, the same influence is  $-0.40$ . According to the Beta coefficient, the variable with more influence is the value creation, with the value of 0.420.

By examining Table A12, we determine the degree of significance through an ANOVA test, referring to variables, motivation, value creation and co-creation. The test reflects that the significance level is less than 0.05, so we reject the null hypothesis and validate the alternative hypothesis, which indicates that hypotheses H1, H3 and H5 are valid.

When observing Table A13 relative to the multiple linear regression coefficients based on the motivation, value creation and co-creation variables, we observe that the motivation and value creation variables, when aggregated, are significant in explaining the development of new products, the same does not happen when the co-creation variable is aggregated, this is because, the degree of significance is higher than 0.05, in this case 0.384. Thus, we observe that the three aggregated variables, according to the sequence described above, are not significant for the explanation of the dependent variable. With the value of the non-standardised coefficient B, we affirm that the variables add value to the dependent variable and, according to the standardised

coefficient Beta, the variable with greater influence is the motivation, with the value of 0.423.

Table A14 presents the degree of significance through an ANOVA test, referring to variables, experience, information and value creation. The test reflects that the significance level is less than 0.05, so we reject the null hypothesis and validate the alternative hypothesis, which indicates that the hypotheses H5, H6 and H7 are valid.

Table A15 is relative to the multiple linear regression coefficient between experience variables, information and value creation. By aggregating the experience with the information, we verify that the significance value, relative to the experience variable is 0.885, much higher than 0.05, which reflects them, together, are not significant in explaining the dependent variable. When adding the value creation variable the same happens with the experience variable, so we affirm that the conjunction of the three variables is not significant in explaining the development of new products. Based on the coefficient B, it is possible to conclude that for each extra value of experience, the value of NPD decreases, 0.70. With the Beta coefficient, we conclude that the variable with the greatest influence is the information.

## 5 Discussion and conclusions

### 5.1 *Discussion and implications for the theory*

The results of this research correspond to the main objectives outlined. The study aimed to analyse the influence of co-creation in the development of new products and/or services from the perspective of value creation or destruction. To this end, it resorted to an exhaustive literature review in order to understand the various concepts addressed and the use of various scales of measurement.

According to the results of the research, we can see that one of the determining factors for consumers in the context of value creation through co-creation in NPD is the motivation, involvement and intrinsic objectives of each consumer determine their success. Directly linked to motivation, emotions reveal their importance to the success of new product development processes, emotional states translate reactions and behaviours of involvement and consumption, which confirms the S-O-R model (Mehrabian and Russell, 1974), and expands existing knowledge (e.g., Cossio-Silva et al., 2016) about the implication of co-creation on marketing activities as well on the implications on new product development.

According to the study, innovation in the development of new products is crucial. Consumers tend to support innovation and innovative products and, in this sense, consumer involvement is superior to them. On the other hand, when we cross the consumer's experience with the innovation process, we understand that the experience is an ambiguous and subjective process, because the nature of the participation, the context and the perception of it changes the quality of the experience and, consequently, the creation of value.

The results of the quantitative analysis indicate that the development of new products and co-creation is effective and allows the creation of value, both for the company and the final consumer. The empirical results confirm the models previously referred to, such as the S-D logic, which argues that value creation happens when processes involve the consumer as the co-creator of value.

Thus, when analysing multiple linear regression we can observe relevant situations and contexts for the analysis of variables when facing the development of new products.

In order to create value and develop new successful products, it can be inferred that co-creation creates value for NPD, when introducing innovation, both create value for NPD, however by integrating motivation in the same context, the significance does not occur, this is because, as mentioned before, motivation is intrinsic and situational. We can verify that in this context the consumer motivation does not add value to NPD.

When we observe co-creation and innovation grouped together, both result for the NPD, but when we introduce value creation into the study, co-creation does not contribute to the NPD, which reveals that co-creation is not synonymous with value. This conclusion runs counter to earlier theories that reflect that co-creation is not synonymous with the success of the NPD and can lead to value destruction (e.g., Svendsen et al., 2011).

We can see a similar outcome when we analyse the motivation to the NPD, which creates value when isolated. When we add innovation to the study, the same is true, but when we introduce co-creation, it no longer represents significance for the NPD. This reflects that co-creation influences the NPD in an atypical way.

We also understand that emotion, information, and value creation are receptive to NPD, and that information and knowledge acquired and shared allow us to disseminate knowledge and increase responsiveness to the market and thus strengthen the success of new products. Still in the context of information, by involving innovation in the study, it is possible to observe the receptivity before NPD, however, by adding the experience, the same is not true. The experience depends on several impellers, among them the emotional, cognitive and relational value, which reflects its subjectivity and instability before different consumers (Sshmitt, 1999).

To increase the success of the NPD, experience is decisive in the process, when isolated. However, when adding value creation and emotion to the study, the same is not true, because as previously mentioned, the experience is subjective and its receptivity meets the needs of the consumer. The same situation is verified when we group the experience with other variables in study, namely information and later, value creation. This findings expands existing knowledge about the combination of experience with other constructs to influence new product development and complements other studies in the field (e.g Echeverri and Skålén, 2011).

In short, it is important to mention that the value perceived by each individual is intrinsic and extrinsic to him. New products and services are necessary from the consumer's point of view, but their success is subjective. Co-creation is fundamental, taking into account the added value of the consumer in the processes of creation and development of products and/or services.

With this study we tested the influence of several factors for the success of NPD, namely motivation, innovation, information and experience. By doing so, as suggested by Lusch and Vargo (2006) we contributed to the SD logic theory by adding empirical evidence to propositions that were stated only theoretically.

## *5.2 Managerial implications*

The theme addressed acts as an attempt to explore issues with great impact on modern marketing, particularly in the relationship between companies and the end consumer. The study and statistical analysis led to several relevant implications that must be considered

for the development of new products with effectiveness and efficiency, in order to achieve the objectives, including the creation of value for the consumer.

First, it is important to benchmark the orientation and practice of innovation processes and how to create an experience that motivates participants to engage in the process of co-creating value. As a company or organisation it is necessary to learn about the desires and needs of consumers, beyond the traditional processes of exchange. By understanding and improving processes, companies can stimulate the co-creation of value by consumers and, consequently, the success of NPD.

For companies and organisations, how the co-creation process defined and implemented has a direct and measurable impact on NPD (Prahalad and Ramaswamy, 2004). Value delivery is superior when the connection points between companies and consumers are also superior.

With these results, companies can develop, according to their characteristics, processes that include the consumer according to the objective of creating a motivating and involving environment, where the exchange of information and experiences is mutual and significant for both environments. This is in line with the theory of Frow et al. (2011) which states that co-creation results through mutually beneficial collaboration.

### *5.3 Limitations and future investigations*

Although this study offers valuable insights into the topics covered, it does have some limitations that need to be addressed, which can also be considered as suggestions for future research.

First, although the sample size is appropriate for this type of research, a larger random sample would provide a deeper and more complex view of the subject.

Second, the sample used in the study was composed only of Portuguese individuals, which limits the study culturally. It could be improved by studying the same concepts in different countries and contexts, since certain responses may be biased due to the current cultural environment. Different life styles and societies may lead to different results.

Third, the chosen conceptual model and the models, theories, and logics mentioned and studied limit the results of the study. For future investigations it would be recommended to approach the same theme using different conceptual models and theories.

Fourth, and not least, quantitative analysis through multiple linear regression, if altered, different values could be demonstrated. In this context, in the future it would be crucial to carry out and use other statistical models and tests.

Finally, the study only analysed in the context of creative industries, so it would be important to refer for future investigations to other industries and professional sectors.

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## Appendix

**Table A1** Correlation of variables

	<i>Cocri</i>	<i>Innovative</i>	<i>Motiv</i>	<i>Emo</i>	<i>CV</i>	<i>Info</i>	<i>Expe</i>
NPD	0.293**	0.371**	0.423**	0.328**	0.404**	0.367**	0.159*
Cocri		0.263**	0.399**	0.328**	0.387**	0.490**	0.340**
Innovative			0.559**	0.458**	0.380**	0.413**	0.132
Motiv				0.570**	0.338**	0.429**	0.228**
Emo					0.315**	0.439**	0.217**
CV						0.465**	0.462**
Info							0.408**

\*Correlation is significant at level 0.05 (2-tailed).

\*\*Correlation is significant at level 0.01 (2-tailed).

**Table A2** ANOVA of variables, co-creation, innovation and motivation

	<i>Model</i>	<i>Sum of squares</i>	<i>df</i>	<i>Average of squares</i>	<i>F</i>	<i>Sig.</i>
1	Regression	4.523	1	4.523	16.758	<b>0.000<sup>a</sup></b>
	Residual	48.315	179	0.270		
	Total	52.839	180			
2	Regression	9.429	2	4.715	19.332	<b>0.000<sup>b</sup></b>
	Residual	43.410	178	0.244		
	Total	52.839	180			
3	Regression	11.685	3	3.895	16.753	<b>0.000<sup>c</sup></b>
	Residual	41.153	177	0.233		
	Total	52.839	180			

<sup>a</sup>Predictors: (Constant), co-creation

<sup>b</sup>Predictors: (Constant), co-creation, innovation

<sup>c</sup>Predictors: (Constant), co-creation, innovation, motivation

<sup>d</sup>Dependent Variable: development of new products

Source: SPSS

**Table A3** Coefficient of co-creation, innovation and motivation variables

		<i>Non standardised coefficients</i>		<i>Standardised coefficients</i>	<i>t</i>	<i>Sig.</i>
<i>Model</i>		<i>B</i>	<i>Standard error</i>	<i>Beta</i>		
1	(Constant)	3.319	0.262		12.668	0.000
	Cocreation	0.262	0.064	0.293	4.094	<b>0.000</b>
2	(Constant)	2.177	0.356		6.113	0.000
	Cocreation	0.188	0.063	0.210	2.978	<b>0.003</b>
	Innovation	0.323	0.072	<b>0.316</b>	4.485	<b>0.000</b>
3	(Constant)	1.710	0.379		4.518	0.000
	Cocreation	0.124	0.065	0.139	1.913	<b>0.057</b>
	Innovation	0.192	0.082	0.188	2.344	<b>0.020</b>
	Motivation	0.289	0.093	0.263	3.115	<b>0.002</b>

<sup>a</sup>Dependent variable: New product development.

Source: SPSS

**Table A4** ANOVA of variables, emotion, value creation and information

	<i>Model</i>	<i>Sum of squares</i>	<i>df</i>	<i>Average of squares</i>	<i>F</i>	<i>Sig.</i>
1	Regression	5.689	1	5.689	21.597	<b>0.000<sup>a</sup></b>
	Residual	47.150	179	0.263		
	Total	52.839	180			
2	Regression	10.981	2	5.490	23.348	<b>0.000<sup>b</sup></b>
	Residual	41.858	178	0.235		
	Total	52.839	180			
3	Regression	11.979	3	3.993	17.298	<b>0.000<sup>c</sup></b>
	Residual	40.859	177	0.231		
	Total	52.839	180			

<sup>a</sup>Predictors: (Constant), emotion.

<sup>b</sup>Predictors: (Constant), emotion, value creation.

<sup>c</sup>Predictors: (Constant), emotion, value creation, information.

<sup>d</sup>Dependent Variable: development of new products.

**Table A5** Coefficient of variables, emotion, value creation and information

		<i>Non standardised coefficients</i>		<i>Standardised coefficients</i>	<i>t</i>	<i>Sig.</i>
<i>Model</i>		<i>B</i>	<i>Standard error</i>	<i>Beta</i>		
1	(Constant)	3.215	0.253		12.687	0.000
	Emotion	0.268	0.058	0.328	4.647	<b>0.000</b>
2	(Constant)	2.112	0.334		6.329	0.000
	Emotion	0.183	0.057	0.223	3.176	<b>0.002</b>
	Value Creation	0.369	0.078	<b>0.333</b>	4.744	<b>0.000</b>
3	(Constant)	1.910	0.345		5.544	0.000
	Emotion	0.139	0.061	0.169	2.282	<b>0.024</b>
	Value Creation	0.302	0.083	0.273	3.624	<b>0.000</b>
	Information	0.153	0.074	0.166	2.080	<b>0.039</b>

<sup>a</sup>Dependent Variable: development of new products.

**Table A6** ANOVA of variables, innovation, information and experience

<i>Model</i>		<i>Sum of squares</i>	<i>df</i>	<i>Average of squares</i>	<i>F</i>	<i>Sig.</i>
1	Regression	7.267	1	7.267	28.542	<b>0.000<sup>a</sup></b>
	Residual	45.572	179	0.255		
	Total	52.839	180			
2	Regression	10.186	2	5.093	21.255	<b>0.000<sup>b</sup></b>
	Residual	42.652	178	0.240		
	Total	52.839	180			
3	Regression	10.208	3	3.403	14.129	<b>0.000<sup>c</sup></b>
	Residual	42.630	177	0.241		
	Total	52.839	180			

<sup>a</sup>Predictors: (Constant), innovation.

<sup>b</sup>Predictors: (Constant), innovation, information.

<sup>c</sup>Predictors: (Constant), innovation, information, experience.

<sup>d</sup>Dependent Variable: development of new products.

**Table A7** Coefficient of variables, innovation, information and experience

	<i>Model</i>	<i>Non standardised coefficients</i>		<i>Standardised coefficients</i>	<i>t</i>	<i>Sig.</i>
		<i>B</i>	<i>Standard error</i>	<i>Beta</i>		
1	(Constant)	2.685	0.319		8.411	.000
	Innovation	0.380	0.071	<b>0.371</b>	5.342	<b>0.000</b>
2	(Constant)	2.146	0.346		6.198	0.000
	Innovation	0.271	0.076	0.264	3.576	<b>0.000</b>
	Information	0.238	0.068	0.258	3.491	<b>0.001</b>
3	(Constant)	2.116	0.361		5.869	0.000
	Innovation	0.272	0.076	0.265	3.577	<b>0.000</b>
	Information	0.229	0.074	0.249	3.086	<b>0.002</b>
	Experience	0.016	0.053	0.022	0.303	<b>0.762</b>

<sup>a</sup>Dependent Variable: development of new products.

**Table A8** ANOVA of co-creation, innovation and value creation variables

	<i>Model</i>	<i>Sum of squares</i>	<i>df</i>	<i>Average of squares</i>	<i>F</i>	<i>Sig</i>
1	Regression	4.523	1	4.523	16.758	<b>0.000<sup>a</sup></b>
	Residual	48.315	179	0.270		
	Total	52.839	180			
2	Regression	9.429	2	4.715	19.332	<b>0.000<sup>b</sup></b>
	Residual	43.410	178	0.244		
	Total	52.839	180			
3	Regression	12.251	3	4.084	17.808	<b>0.000<sup>c</sup></b>
	Residual	40.588	177	0.229		
	Total	52.839	180			

<sup>a</sup>Predictors: (Constant), co-creation.

<sup>b</sup>Predictors: (Constant), co-creation, innovation.

<sup>c</sup>Predictors: (Constant), co-creation, innovation, value creation.

<sup>d</sup>Dependent Variable: development of new products.

**Table A9** Coefficient of variables, co-creation, innovation and value creation

		<i>Non standardised coefficients</i>		<i>Standardised coefficients</i>		
<i>Model</i>		<i>B</i>	<i>Standard error</i>	<i>Beta</i>	<i>t</i>	<i>Sig.</i>
1	(Constant)	3.319	0.262		12.668	0.000
	Cocreation	0.262	0.064	0.293	4.094	<b>0.000</b>
2	(Constant)	2.177	0.356		6.113	0.000
	Cocreation	0.188	0.063	0.210	2.978	<b>0.003</b>
	Innovation	0.323	0.072	<b>0.316</b>	4.485	<b>0.000</b>
3	(Constant)	1.665	0.375		4.442	0.000
	Cocreation	0.115	0.065	0.128	1.777	<b>0.077</b>
	Innovation	0.242	0.074	0.237	3.294	<b>0.001</b>
	Value Creation	0.292	0.083	0.264	3.508	<b>0.001</b>

<sup>a</sup>Dependent Variable: development of new products.

**Table A10** ANOVA of variables, experience, value creation and emotion

		<i>Sum of squares</i>	<i>df</i>	<i>Average of squares</i>	<i>F</i>	<i>Sig.</i>
1	Regression	1.334	1	1.334	4.636	<b>0.033a</b>
	Residual	51.505	179	0.288		
	Total	52.839	180			
2	Regression	8.660	2	4.330	17.446	<b>0.000<sup>b</sup></b>
	Residual	44.179	178	0.248		
	Total	52.839	180			
3	Regression	11.109	3	3.703	15.706	<b>0.000<sup>c</sup></b>
	Residual	41.730	177	0.236		
	Total	52.839	180			

<sup>a</sup>Predictors: (Constant), experience.

<sup>b</sup>Predictors: (Constant), experience, value creation.

<sup>c</sup>Predictors: (Constant), experience, value creation, emotion.

<sup>d</sup>Dependent Variable: development of new products.



**Table A11** Coefficient of variables, experience, value creation and emotion

		<i>Non standardised coefficients</i>	<i>Standardised coefficients</i>			
<i>Model</i>		<i>B</i>	<i>Standard error</i>	<i>Beta</i>	<i>t</i>	<i>Sig.</i>
1	(Constant)	3.932	0.212		18.586	0.000
	Experience	0.115	0.053	0.159	2.153	<b>0.033</b>
2	(Constant)	2.620	0.311		8.419	0.000
	Experience	-0.025	0.056	-0.035	-0.453	<b>0.651</b>
	Value Creation	0.465	0.086	<b>0.420</b>	5.433	<b>0.000</b>
3	(Constant)	2.146	0.337		6.362	0.000
	Experience	-0.040	0.055	-0.056	-0.736	<b>0.462</b>
	Value Creation	0.396	0.086	0.358	4.602	<b>0.000</b>
	Emotion	0.186	0.058	0.228	3.223	<b>0.002</b>

<sup>a</sup>Dependent Variable: development of new products.

**Table A12** ANOVA of variables, motivation, value creation and co-creation

<i>Model</i>		<i>Sum of squares</i>	<i>df</i>	<i>Average of Squares</i>	<i>F</i>	<i>Sig.</i>
1	Regression	9.442	1	9.442	38.945	<b>0.000<sup>a</sup></b>
	Residual	43.397	179	0.242		
	Total	52.839	180			
2	Regression	13.502	2	6.751	30.550	<b>0.000<sup>b</sup></b>
	Residual	39.336	178	0.221		
	Total	52.839	180			
3	Regression	13.671	3	4.557	20.593	<b>0.000<sup>c</sup></b>
	Residual	39.168	177	0.221		
	Total	52.839	180			

<sup>a</sup>Predictors: (Constant), motivation.

<sup>b</sup>Predictors: (Constant), motivation, value creation.

<sup>c</sup>Predictors: (Constant), motivation, value creation, co-creation.

<sup>d</sup>Dependent Variable: development of new products.

**Table A13** Coefficient of variables, motivation, value creation and co-creation

		<i>Non standardised coefficients</i>		<i>Standardised coefficients</i>	<i>t</i>	<i>Sig.</i>
<i>Model</i>		<i>B</i>	<i>Standard error</i>	<i>Beta</i>		
1	(Constant)	2.272	0.340		6.687	0.000
	Motivation	0.465	0.075	<b>0.423</b>	6.241	<b>0.000</b>
2	(Constant)	1.464	0.375		3.904	0.000
	Motivation	0.356	0.076	0.323	4.706	<b>0.000</b>
	Value Creation	0.326	0.076	0.295	4.287	<b>0.000</b>
3	(Constant)	1.409	0.381		3.703	0.000
	Motivation	0.334	0.080	0.304	4.203	<b>0.000</b>
	Value Creation	0.306	0.080	0.276	3.840	<b>0.000</b>
	Cocreation	0.058	0.066	0.064	0.873	<b>0.384</b>

<sup>a</sup>Dependent Variable: development of new products.

**Table A14** ANOVA of experience, information and value creation variables

<i>Model</i>		<i>Sum of squares</i>	<i>df</i>	<i>Average of squares</i>	<i>F</i>	<i>Sig.</i>
1	Regression	1.334	1	1.334	4.636	<b>0.033<sup>a</sup></b>
	Residual	51.505	179	0.288		
	Total	52.839	180			
2	Regression	7.127	2	3.563	13.876	<b>0.000<sup>b</sup></b>
	Residual	45.712	178	0.257		
	Total	52.839	180			
3	Regression	11.145	3	3.715	15.771	<b>0.000<sup>c</sup></b>
	Residual	41.694	177	.236		
	Total	52.839	180			

<sup>a</sup>Predictors: (Constant), experience.

<sup>b</sup>Predictors: (Constant), experience, information.

<sup>c</sup>Predictors: (Constant), experience, information, value creation.

<sup>d</sup>Dependent Variable: development of new products.

**Table A15** Coefficient of variables, experience, information and value creation

		<i>Non standardised coefficients</i>		<i>Standardised coefficients</i>	<i>t</i>	<i>Sig.</i>
<i>Model</i>		<i>B</i>	<i>Standard error</i>	<i>Beta</i>		
1	(Constant)	3.932	0.212		18.586	0.000
	Experience	0.115	0.053	0.159	2.153	<b>0.033</b>
2	(Constant)	2.907	0.294		9.880	0.000
	Experience	0.008	0.055	0.011	0.144	<b>0.885</b>
	Information	0.335	0.071	<b>0.363</b>	4.749	<b>0.000</b>
3	(Constant)	2.184	0.332		6.583	0.000
	Experience	-0.070	0.056	-0.097	-1.249	<b>0.213</b>
	Information	0.233	0.072	0.253	3.248	<b>0.001</b>
	Value Creation	0.366	0.089	0.331	4.130	<b>0.000</b>

<sup>a</sup>Dependent Variable: development of new products.