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Do myriad e-channels always create value for customers? A dynamic analysis of the perceived value of a digital information product during the usage phase

Rémi MENCARELLI, Arnaud RIVIERE, and Cindy LOMBART

Abstract

The academic literature generally asserts that omnichannel strategies create value throughout the customer journey based on the principle of synergy between channels. However, such strategies may appear complex to customers, notably when they face myriad e-channels that constitute all means of accessing the offer. Specifically, for digital information products, such as those of the press, digitalized content is now consumed through multiple e-channels. Our study aims to investigate the impact of e-channel combinations on the perceived value of a digital information product during the usage phase. We hypothesize that the similarity between the e-channels used by customers has a negative impact on the perceived value model. To test the research hypotheses, we conducted a longitudinal study of the readers of a digital version of an international newspaper. The results demonstrate that the similarity of e-channels impedes value creation. Our findings reintroduce a more ambivalent vision of the omnichannel strategy in a digital environment and provide insights into how managers should support customers by clarifying the usefulness of each e-channel proposed.

Keywords

Omnichannel strategy; e-channel; value; sacrifice; benefit; digital information product

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1. Introduction

Omnichannel strategies have become increasingly popular in recent years because managers view them as powerful levers of value creation for businesses. These strategies can satisfy today's consumer expectations and address client retention concerns (Hossain et al., 2019; Kumar and Reinartz, 2016). However, one of the major challenges associated with the deployment of these omnichannel strategies is the delivery of positive and rich experiences throughout the customer's journey by exploiting many channels (Hossain et al., 2020; Lemon and Verhoef, 2016). Businesses must propose seamless experiences that are homogeneous, uniform, integrated, and frictionless, with no gaps between the different channels. This entails harnessing the advantages of each channel combined with synergy effects (Verhoef et al., 2015; Zhang et al., 2018), which Hossain et al. (2019, 2020) defined as omnichannel integration quality. Nonetheless, the range of electronic channels or e-channels—categories of Internet-enabled devices, such as personal computers, smartphones, and tablets (Wagner et al., 2020)—that customers currently use has expanded and complicated the attainment of this objective (Hamilton and Price, 2019; Lemon and Verhoef, 2016). In this context, various e-channel combinations play a crucial role in value creation for customers (Zhang et al., 2018).

Drawing on the customer journey model (Hossain et al., 2019; Lemon and Verhoef, 2016), academic works generally support the idea of value creation associated with omnichannel strategies at each stage of the customer journey owing to the complementarity effects between these channels that consumers utilize (Acquila-Natale and Iglesias-Pradas, 2021; Verhoef et al., 2015; Xu et al., 2014). However, these results deserve reexamination. First, most studies have presumed a coupling between physical and e-channels and have thus focused on the merits of combining channels with clear and distinct benefits (Dholakia et al., 2005; Kollmann et al., 2012; Montoya-Weiss et al., 2003). They have not considered the current diversity of e-channels used by consumers for online activities (Kannan and Li, 2017; Wagner et al., 2020). The accumulation of e-channels can make the customer journey more complex (Hamilton and Price, 2019; Lemon and Verhoef, 2016), providing only anecdotal value to the added channels because of the similarity of their characteristics or usages (Deleersnyder et al., 2002; Wagner et al., 2020). Second, the problems addressed are limited mainly to the substitutability or complementarity effects between channels in the information search (pre-purchase) and choice (purchase) phases of the customer journey model (Ansari et al., 2008; Balasubramanian et al., 2005; Cortinas et al., 2010; Dholakia et al., 2005, 2010). This leaves the usage (post-purchase) phase underexplored (Lemon and Verhoef, 2016). However, for some products, such as video games, movies, music, or those of publishing or the press, whose content may be digital, the customer journey continues in the usage phase. In the press sector, in particular, with the proliferation of new digital media outlets, both academic researchers and marketing practitioners have highlighted the need to gain a richer understanding of the way digital information products are consumed through multiple e-channels (Berger et al., 2015; Kannan and Li, 2017; Karimi and Walter, 2015; Wagner et al., 2020; Xu et al., 2014). Following Koukova et al. (2008), digital information products refer to digital content whose primary purpose is to convey information and whose form is traditionally physical (e.g., books, newspapers, magazines, blu-ray disc). Third, the analyses presented in the literature have been conducted at a specific point in the customer journey. Yet customers may display variable preferences and uses of channels throughout the phases of the customer journey and interaction with the offer (Avery et al., 2012; Lemon and Verhoef, 2016). In this context, Becker and Jaakkola (2020) call on researchers to adopt an extended time perspective for analyzing the interaction between different channels in a dynamic way during the customer journey. Considering these theoretical limitations, we

address the following research question: *To what extent do the e-channel combinations used to access a digital information product create value for the customer during the usage phase?*

To answer the above-mentioned research question, we examine, over time, the effects of the accumulation of different types of e-channels on the perceived value of a digital information product in the usage phase. The newspaper industry has been used as a field of empirical investigation because of issues linked to the digital transformation of content (product) and access (channels) over the past decade (Berger et al., 2015; Xu et al., 2014). The results obtained notably shed light on the negative effect of the similarity of e-channels on the perceived value of the digital information product. Specifically, readers who added an e-channel similar to those e-channels previously used reported a decrease in value through a stronger negative impact of perceived sacrifices. By contrast, readers who added and used a dissimilar e-channel experienced value creation, as the negative influence of perceived sacrifices was alleviated.

From a theoretical standpoint, the present study responds to recent research calls for scholars to better understand the influence of alternative e-channels during the customer journey model in the context of e-channel fragmentation (Hajdas et al., 2020; Marketing Science Institute, 2020; von Briel, 2018; Wagner et al., 2020). More specifically, we build on the current customer journey model by expanding the types of offers and channels studied (exclusively digital offers and e-channels), the study phase (usage phase), and the effects of the use of these channels over time (longitudinal approach). In addition, by underlying the role of (dis)similarity between myriad e-channels, our results contribute to examining the conditions of omnichannel integration quality in the digital context (Hossain et al., 2019, 2020). From a managerial standpoint, this research provides companies dealing with digital information products with potential avenues for improving their omnichannel strategies when they deploy additional e-channels. We provide insights into how an omnichannel strategy can favorably support the usage phase of the customer journey (Kannan and Li, 2017; Lemon and Verhoef, 2016).

In the remainder of the article, the value creation potential of the omnichannel strategy is situated and discussed. The research model and hypotheses are then presented. A description of the methodology is followed by the presentation of results. Lastly, the main contributions of the study are analyzed, and the limitations, which give rise to several research avenues, are outlined.

2. Literature review

2.1 Omnichannel strategy: a lever for value creation throughout the customer journey

The combination of channels—be they physical or electronic—is currently the distribution strategy most frequently adopted by economic actors regardless of sector (Lemon and Verhoef, 2016; Maity et al., 2018). According to Neslin et al. (2006, p. 96), a channel can be defined as “a customer contact point, or a medium through which the firm and the customer interact.” This strategy of adding channels through which a business and customer interact has been described successively as a multi-, cross-, and omnichannel strategy, depending on the degree of integration of channel management (Hallikainen et al., 2019; Huré et al., 2017). Defined as the complete integration of all channels made available to customers (Barwitz and Maas, 2018; Hossain et al., 2020), the omnichannel strategy appears to be the most advanced approach in channel management. It aims to deliver positive experiences throughout the

customer journey—that is, during the information search, choice, and usage phases—in order to increase the value of the offer for the customer and maximize the customer value for the firm (Lemon and Verhoef, 2016). The interest in this strategy has been currently reinforced with the development of e-channels that Wagner et al. (2020, p. 257) defined “as a category of Internet-enabled devices (for example, mobile devices) that consumers can use to interact with and purchase products.” They considered mobile devices (e.g., smartphones, tablet computers) as channels that differ from fixed e-channels (e.g., PCs, laptops, desktop computers), as established also in other recent studies (De Haan et al., 2018; Lemon and Verhoef, 2016; Sohn, 2017; Sohn et al., 2017).

Omnichannel strategies have received an enthusiastic reception among practitioners (Beck and Rygl, 2015), consistent with academic research—including recent studies (see Table 1)—that mainly emphasize the merits of these omnichannel approaches for businesses and customers. This premise rests mainly on the principle of synergy between channels in that these omnichannel strategies can combine the benefits of different channels—mainly a mix of physical and e-channels—to yield the highest value for customers (Gensler et al., 2012; Hossain et al., 2020; Singh et al., 2014; Verhoef et al., 2015; Xu et al. 2014). For example, customers can combine channels during their purchase process to benefit from their respective advantages—information search and reservation on the Internet followed by pick-up of the product in store or use of a cellphone at the point-of-sale to compare product prices online and in store (Flavián et al., 2019). Similarly, a mobile e-channel (smartphone, tablet) can be the source of value creation in contrast to fixed e-channels (desktop or laptop computers) that possess little or no mobility given their substantially different characteristics, such as size, portability, and ubiquity. Some studies have identified usages of mobile e-channels that appear to differ from those of channels with little or no mobility (De Haan et al., 2018; Wagner et al., 2020).

The omnichannel is therefore associated with the idea of a consistent and seamless experience that is both homogeneous and frictionless, with no gaps between different channels (Huré et al., 2017; Verhoef et al., 2015), which is what Hossain et al. (2019, 2020) referred to as omnichannel integration quality. For businesses, the implementation of an omnichannel strategy should not only improve profitability (Kumar and Venkatesan, 2005; Venkatesan et al., 2007; Zhang et al., 2019) but also enhance their efficiency by generating satisfactory value propositions and allowing businesses to reach appropriate customers at a lower cost (Barwitz and Maas, 2018; De Keyser et al., 2015). The academic literature highlights the many benefits or advantages that customers can derive from these omnichannel strategies: more efficient services, more accessible offers, and more effective, convenient, and pleasant experiences depending on the channels mobilized (Carlson et al., 2015; Hossain et al., 2019; Hult et al., 2019; Pantano and Viassone, 2015). Consequently, omnichannel strategies purportedly generate higher satisfaction and improve brand loyalty among customers (Herhausen et al., 2015). Ultimately, as summed up by Hossain et al. (2019, p. 155), the objective of such a strategy is “the design, execution, organization, and assessment of different channels to improve customer value through customer relationship management.”

[insert Table 1 around here]

2.2 Ambivalence of the omnichannel strategy for a digital information product during the usage phase

Although omnichannel strategies potentially create value, they are nonetheless complex to implement and difficult to manage from the standpoint of firms. Several studies have questioned the positive impact of this type of strategy for businesses. For instance, Kushwaha and Shankar (2013) empirically demonstrated that customers who use several channels are not necessarily the most profitable customer segment. Depending on the nature of the product category (hedonic or utilitarian) and the perceived risk associated with the product, customers who favor only one channel may be more profitable. Cambra-Fierro et al. (2016) extended this analysis by applying it to services and showed that customers are profitable depending on the nature of the channels used and the interactions generated by the use of the channels.

If omnichannel strategies do not systematically create value for businesses, we can also question this value creation from customers' standpoint. As Kannan and Li (2017) contended, the customer journey may be transformed when they use a wide array of new channels. Several studies have empirically demonstrated that the utility associated with different channels varies depending on the step in the customer journey and on the customers' characteristics (De Keyser et al., 2015; Konus et al., 2008). These works underscore that the value creation of an omnichannel strategy is not systematic. However, these studies have mainly focused on the question of choices between different channels during the pre-purchase and purchase phases. Regarding the entire customer journey (Lemon and Verhoef, 2016), the usage phase appears to be rarely explored (see Table 1). After purchase, the product is used by customers without necessarily prolonging the interactions with the companies apart from the procurement of after-sales services or service requests (Barwitz and Maas, 2018; De Keyser et al., 2015).

However, for some product categories with digital content, such as digital information products, the customer journey extends beyond the purchase phase. This is because the product itself can be consumed through various channels. For these digital information products, the usage phase thus appears to be decisive in the customer journey (Lemon and Verhoef, 2016) for the following reasons: 1) it extends over time, as the usage phase covers a multiplicity of successive interactions between the customer and the offer, 2) the product consumed consequently plays a decisive role in this process, 3) customers are likely to use multiple e-channels in combination to access the product, and 4) the utility gained from the usage phase is a potential trigger of customer loyalty behavior (*loyalty loop*; Court et al., 2009). For these products with digital content, the usage phase appears not only decisive but also potentially complex because of its scope, the multiplicity of interactions that it can encompass, and customers' ability to use many e-channels (e.g., computers, smartphones, tablets) to access digital information products. Consequently, in this context, the capacity of an omnichannel strategy to create value for customers deserves investigation.

2.3 Effects of e-channel combinations on the perceived value model

To cite the most commonly used definition (Leroi-Werelds et al., 2014; Zeithaml, 1988; Zeithaml et al., 2020), perceived value is considered the net value of the merits or benefits of a product or service perceived by customers given the costs or sacrifices they are willing to accept in order to satisfy their needs. Benefits or *get components* refer to what customers are seeking, expecting, or experiencing when they purchase and consume an offer. As noted by Kumar and Reinartz (2016), customers aggregate the attributes of an offering onto abstract

benefits. Sacrifices or *give components* refer to customers' perceptions of price (monetary sacrifice) and of the time and effort, mental stress, or emotional labor (non-monetary sacrifices) needed to obtain or use the offer (Lapierre, 2000).

Following the principle of maximizing utility, for the customer to perceive positive value, the perceived benefits must exceed the perceived sacrifices. As perceived value cannot be measured or observed directly, academics have developed compositional methods¹ to model it (Kumar and Reinartz, 2016). In the compositional approach, perceived value is a function of the perceived benefits and the corresponding perceived sacrifices. Accordingly, the key tasks to be completed are 1) measuring the global perceived value, 2) measuring the associated underlying benefits and sacrifices, and 3) determining the relative weights that link the perceived benefits/sacrifices to the global perceived value. Consistent with seminal research on value (e.g., Zeithaml, 1988) and many previous studies (e.g., Gallarza and Gil Saura, 2006; Lin et al., 2005; Ulaga and Eggert, 2006), the global perceived value appears as a central and more abstract construct that is separate from but complementary to the perceived benefits and sacrifices.

This model is well suited for capturing the value creation process during the usage phase of the customer journey model. First, perceived value is an evaluation judgment that can be used throughout the customer journey (Kumar and Reinartz, 2016). Whereas perceived value can be mobilized during the pre-purchase (*customer value*) and purchase (*shopping value*) phases (Acquila-Natale and Iglesias-Pradas, 2021), it is also salient during the usage phase (*consumption value*). Moreover, because this final step in the customer journey comprises a multitude of interactions involving the customer and the product, perceived value appears to be a pertinent concept for our study, as it results from interactions with a class of objects (Holbrook, 1999). This approach also leads to an understanding of the consequences of product use from the customer perspective rather than simply focusing on the attributes of the offer (Leroi-Werelds et al., 2014). Lastly, it considers the joint influence of perceived benefits and sacrifices, so the perceived value model allows one to evaluate the positive and/or negative effects linked to an offer. The model avoids sole consideration of the benefits associated with an offer and instead captures also the potential negative consequences of the offer (Acquila-Natale and Iglesias-Pradas, 2021; Kumar and Reinartz, 2016).

By applying this model, the literature suggests that the joint usage of different channels can increase the perceived value of the digital information product in the usage phase. The principle of synergy and complementarity of the benefits of the different channels used states that the joint use of channels should increase the benefits and decrease the sacrifices associated with the consumption of the offer, together with the ensuing perceived value (Gensler et al., 2012; Singh et al., 2014; Verhoef et al., 2015; Xu et al. 2014). However, this value creation hypothesis deserves reexamination in the digital information product context, in which consumers now rely on a significantly expanded set of e-channels.

Indeed, the nature of the e-channels adopted can alter the perceived value associated with a digital information product. Studies have confirmed that not all channels used during the pre-purchase and purchase phases systematically create value (De Keyser et al., 2015; Konoş et al., 2008). In particular, the perceived utility of a new channel may appear marginal owing to its overly high similarity with the other channels proposed and used. This finding may hold for the accumulation of mobile e-channels (smartphones and tablets) through which

¹ The decompositional method is another and less common approach based on observed choice—considered as revealed preferences—to infer perceived value (Kumar and Reinartz, 2016).

consumers can access the same digital information product because of the similarity of their intrinsic characteristics (ubiquity, portability, compactness, connectivity, interoperability, and localization) and situational benefits (Shankar and Balasubramanian, 2009; Varnali and Toker, 2010; Wagner et al., 2020). These mobile e-channels offer identical advantages in terms of flexibility/availability because they can be used by consumers anywhere (spatial flexibility) and at any time (temporal flexibility). Thus, the use of similar e-channels may be ambiguous because customers are likely to juxtapose them without perceiving any synergy effects (absence of additional benefit). This issue also refers to the appropriateness of channels, that is, the suitability of each channel in providing the service (Banerjee, 2014; Hossain et al., 2019, 2020).

In the specific context of the press, a substitute effect may occur if the new e-channel closely duplicates the capabilities of the existing channel, it offers new capabilities, and/or consumers perceive the two e-channels as similar along key dimensions (Xu et al., 2014). Considering the distinction between content utility and form utility (its mode of delivery, its channel), a customer who uses two e-channels to consume digital information products will not obtain extra utility from having the same content twice. However, the customer can derive two separate form utilities if the e-channels are perceived as complementary and have advantages over one another in specific usage situations: one form (e.g., a mobile e-channel) is more appropriate for some situations, whereas the other form (e.g., a fixed e-channel) is more appropriate for other situations (de Haan et al., 2018). If consumers view the usage situations of two forms of an information good as the same, the forms become redundant and are perceived as substitutes (Koukova et al., 2008). Concerning mobile e-channels, their usage situations can be perceived as similar, as they are mostly used to access news during commutes (Berger et al., 2015). This multiplication of mobile e-channels can cause individuals to experience escalating information overload, which, in turn, impedes value creation (Lemon and Verhoef, 2016). Consumers then perceive the use of a multitude of e-channels as complex, and the addition of similar e-channels can be a source of value destruction.

On the basis of this omnichannel literature review and the compositional approach of perceived value, we put forward two hypotheses (cf. Figure 1). First, the combination of e-channels can impact the perceived value through the perceived benefits. Indeed, in case of a similar e-channel, a superposition effect may appear. In other words, if the e-channels present the same attributes, the consumer can perceive the additional e-channel with identical attributes as useless which, in turn, tend to dilute the effect and importance of the attributes initially appreciated and valued by individuals (Simonson et al., 1994). Then, it could lead to a negative impact on the benefits associated with the offer. Thus, we expect that the use of similar e-channels can result in value destruction through the decreased influence of perceived benefits. Conversely, consumers who combine dissimilar e-channels should experience value creation through the increased influence of the perceived benefits. Thus, we hypothesize the following:

H1: In a given e-channel combination, the use of an additional e-channel whose intrinsic and/or usage characteristics are similar (dissimilar) to those of e-channels already being used decreases (increases) the positive impact of the perceived benefits on the global perceived value of the digital information product.

Second, the complementarity of e-channels can also affect the perceived value through perceived sacrifices. Indeed, in case of a dissimilar e-channel, a synergy effect may appear (Fornari et al., 2016). Hence, the utility of each additional e-channel makes it possible, not only to increase benefits based on the different attributes of the channels, but also to alleviate the undesired consequences (or perceived sacrifices). As noted by Kumar and Reinartz (2016, p.37), “*customers choose actions that, ceteris paribus, maximize the desired consequences and minimize concurrent undesired consequences.*” Thus, we believe that a combination of similar e-channels should lead to an increase in the negative weight of perceived sacrifices on the global perceived value, contrary to the use of dissimilar e-channels, which should alleviate their negative influence. Therefore, we put forward the following hypothesis:

H2: In a given e-channel combination, the use of an additional e-channel whose intrinsic and/or usage characteristics are similar (dissimilar) to those of e-channels already being used increases (decreases) the negative impact of the perceived sacrifices on the global perceived value of the digital information product.

[insert Figure 1 around here]

3. Methodology

3.1 Study context and data collection

To test the research hypotheses, we conducted an online study of a sample of readers of a major international newspaper via its internal panel of 4,500 readers. This press title is a reference publication in the world and is a leader in its domestic market (the most widely read paid national daily newspaper). This publication was chosen for three reasons: 1) the presence of major managerial challenges prevailing in the press sector related to the omnichannel strategy in terms of the digital transformation of access and content (Sismeiro and Mahmood, 2018; Xu et al., 2014), 2) the existence of the newspaper retained in digital format and the accessibility of its content on different fixed (computer) and mobile (smartphone and tablet) e-channels, and 3) the ability to survey the same individuals more than once via the internal panel. We therefore attempted to interview twice the 4,500 readers on the panel via a self-administered online questionnaire at a 12-month interval concerning the digital version of the newspaper. A total of 1,028 respondents participated in the first wave of the survey, and 705 respondents replied to the second wave of the survey, which is equal to an attrition rate of 31.4% compared with the first wave. Thus, our final sample consisted of 705 respondents who participated in both waves of the study. The data gathered in these two waves were matched based on panelist number.

3.2 Measures

Given the research objectives and the hypotheses developed, two categories of variables were retained and measured identically during the two waves of the study.

The first set of variables describes readers’ behaviors. In particular, the use of self-reported variables regarding the use of different e-channels allows us to identify, for each reader surveyed and for each wave of the survey, the number of e-channels used to read the digital version of the newspaper and the types of e-channels used. Consistent with many previous studies (Berger et al., 2015; De Haan et al., 2018; Kannan and Li, 2017; Wagner et al., 2020; Xu et al., 2014), the computer (desktop or laptop) is considered in this research as a fixed e-

channel, whereas a tablet and a smartphone (both of which are handheld technologies)—perceived as closed substitutes (De Haan et al., 2018)—are considered as mobile e-channels. During the survey, a control measure was introduced to verify that an additional e-channel that the respondents used between t_0 and t_1 was not previously used at t_0 to access the digital offer.

The second set of variables captures the different concepts of the compositional model of perceived value with concepts referring to the offer, that is, the digital version of the newspaper. First, a nine-item measure captured the different perceived benefits (i.e., functional, emotional, and social) associated with the offer consumed (Sweeney and Soutar, 2001; Walsh et al., 2014). These benefits have been identified in an omnichannel context (Acquila-Natale and Iglesias-Pradas, 2021; Huré et al., 2017). Given that perceived benefits are a hierarchical construct, as several studies have demonstrated (Chen and Lin, 2015; Wetzels et al., 2009), they will be treated as a second-order construct. Second, a three-item measure captured the non-monetary perceived sacrifices (i.e., psychological and temporal costs) associated with the offer consumed (Acquila-Natale and Iglesias-Pradas, 2021; Kleijnen et al., 2007; Mukherjee and Hoyer, 2001). Monetary sacrifices, typically included in models of perceived value (Dodds et al., 1991), were not integrated here because we evaluated the usage phase and not the purchase phase of the customer journey. In addition, isolating the monetary sacrifice specific to the digital offer is difficult because most readers access this offer via their print subscription. Third, a three-item measure captured the global perceived value derived from the digital offer (Dodds et al., 1991; Leroi-Werelds et al., 2014). Annex A presents the measurement scales used in this study.

3.3 Structure of the sample

The use of self-reported variables of usage and frequency of usage of e-channels over each study period allowed us to identify, in our sample of 705 respondents, five subgroups that characterized the sample of readers of the newspaper (see Table 2). According to the levels of usage defined by sector professionals (<https://www.pewresearch.org>) and based on a similar approach in an academic context (Kushwaha and Shankar, 2013), readers can be considered users of an e-channel if they use it to access the newspaper once a month. Three groups of individuals ($n = 141$, $n = 161$, $n = 173$) showed stable behaviors by using the same number (1, 2, or 3) and types of e-channels (fixed vs. mobile) during the two waves of the survey. Two other groups of individuals ($n = 112$, $n = 118$) changed their behavior as a result of the introduction in t_1 of a new mobile e-channel in addition to the e-channels used in t_0 . As the objective of this research is to assess the impact of an additional (similar/dissimilar) e-channel on the perceived value of an offer (see Figure 1), only the last two groups of readers who changed their behavior between t_0 and t_1 are retained for further analysis and are named groups 1 and 2. Indeed, one group of readers (group 1) added a dissimilar (mobile) e-channel to the previously mobilized (fixed) e-channel, and the other group of readers (group 2) added a similar (mobile) e-channel to the previous combination of (fixed and mobile) e-channels. Appendix B provides an overview of the profiles of these two groups of readers (age, socio-professional category, education, household size, etc.)².

[insert Table 2 around here]

² It should be mentioned that if the groups studied may differ according to their profile, this would not impact the research aims. Indeed, in this research, we want to compare each group, one by one, between t_0 and t_1 and not between them. Consequently, consumers were naturally dispatched in these groups according to their e-channel usage habits and not randomly, as in an experiment.

3.4 Statistical methods

To analyze the data, we used partial least squares structural equation modeling (PLS-SEM) with a bootstrap procedure with 5,000 replications (Tenenhaus et al., 2005). We utilized PLS-SEM, which is variance based, instead of covariance-based structural equation modeling, for two main reasons, which Hair et al. (2012) clarified in their meta-analysis of the use of PLS-SEM in marketing research and which Hair et al. (2014) revisited in their review article. These reasons are as follows: 1) PLS-SEM does not require the variables to follow a multivariate normal distribution (computed coefficient Mardia $> |3|$ in this research), and 2) it allows one to work with small samples (in this research, below the mean of 211.29 in the field of marketing). As noted by Akter et al. (2017), PLS-SEM is a suitable technique to establish rigor in structural equation modeling.

Statistical analyses were performed in three steps to test the hypotheses. First, the psychometric qualities of the scales associated with the constructs of our model of perceived value were evaluated. Different tests determined the reliability (CR), convergent (AVE) and discriminant validity, and stability of the measurement scales used in the two waves of the study for the two groups of readers identified and retained for analysis. The second step of the analyses is to test all the links of causality of the compositional model of perceived value for both groups of readers, one by one, during the two time periods (t_0 and t_1). The objective of the second step is to ensure the coherence of the model of perceived value with the previous results identified in the literature. The third and last step of the analyses compares the strength of the links of causality between the variables of the model for both groups, one by one, between t_0 and t_1 . In other words, the objective is to compare the perceived value model for each group between two periods, with each group being strictly composed of the same readers between t_0 and t_1 . The method developed by Roemer (2016) to treat longitudinal data with PLS-PM was retained. It particularly involves examining whether the beta coefficient associated with the effect of X on Y in t ($X_t \rightarrow Y_t$) falls within the confidence interval of the effect of the beta coefficient of X on Y in t_{+1} ($X_{t+1} \rightarrow Y_{t+1}$) and vice versa. This method was recently applied in the field of management to analyze panel data (Benitez et al., 2018; Palos-Sanchez et al., 2019).

4. Results

The first step of the statistical analyses consists of evaluating the psychometric qualities of the measurement scales and confirming their stability. The analyses conducted established the reliability and convergent and discriminant validities of the different scales used to measure benefits, non-monetary sacrifices, and global perceived value for both groups in t_0 and t_1 (Appendix C). Thus, the measurement scales used present psychometric qualities that are satisfactory and stable for both groups of readers and for both study periods. In addition, the presence of a second-order factor for benefits was confirmed by the correlations between the first-order factors (i.e., functional, emotional, and social benefits).

The second step of the statistical analyses consisted of testing the compositional model of perceived value for the two groups of readers in t_0 and t_1 . The path coefficients (see Table 3) indicate that for both groups, the benefits positively affect the global perceived value, and non-monetary sacrifices negatively affect the global perceived value. The results therefore appear consistent with the findings in the literature (Kumar and Reinartz, 2016; Leroi-Werelds et al., 2014).

Before conducting the third step of our analyses, we compare the means for each construct of our model between t_0 and t_1 for both groups (Appendix D). We can note significant differences regarding global perceived value and perceived sacrifices, but no significant differences in perceived benefits. For group 1, perceived sacrifices significantly decrease ($p < 0.01$) while global perceived value significantly increases ($p < 0.01$). For group 2, perceived sacrifices significantly increase ($p < 0.01$) while global perceived value significantly decreases ($p < 0.01$). Then, for both groups³, the differences calculated between the coefficients in t_0 and t_1 , along with their levels of significance established, allow us to compare the variation in the strength of the ties of causality between the variables of the model according to the levels of usage of the e-channels (Table 3).

In the sample, one of the two groups used a fixed e-channel in t_0 and added a mobile e-channel in t_1 (group 1). Thus, for this group of readers who combine dissimilar e-channels, the analyses point to a decrease in the impact of perceived sacrifices on the global perceived value ($\beta_{t_0} = -0.176, p < 0.05$ and $\beta_{t_1} = -0.004, n.s.$). The difference calculated between the two coefficients between t_0 and t_1 is significant ($\Delta\beta = -0.172$). We did not observe a significant difference regarding the effects of perceived benefits on the global perceived value between t_0 and t_1 ($\beta_{t_0} = 0.659, p < 0.01$; $\beta_{t_1} = 0.595, p < 0.01$; $\Delta\beta = 0.064$). Therefore, the use of a mobile e-channel in addition to a fixed e-channel does not increase the weight of perceived benefits on the global perceived value. This result does not support H1. However, in line with H2, the use of dissimilar channels alleviates the negative influence of perceived sacrifices on the perceived value of the digital newspaper. This result implies the existence of a complementarity effect between different e-channels, which is consistent with the literature (De Haan et al., 2018; Wagner et al., 2020). Accordingly, the combination of dissimilar e-channels, given their disparate intrinsic characteristics, can improve readers' perceived value of the offer.

In parallel, the other group of readers used two e-channels in t_0 (one fixed and one mobile e-channel) and added a second mobile e-channel in t_1 (group 2). Thus, this group of readers accumulated two mobile e-channels (smartphone and tablet) that have the same intrinsic characteristics (Wagner et al., 2020). For this group, we did not observe significant difference regarding the effects of perceived benefits on the global perceived value between t_0 and t_1 ($\beta_{t_0} = 0.631, p < 0.01$; $\beta_{t_1} = 0.549, p < 0.01$; $\Delta\beta = 0.082$). This result does not confirm H1. Furthermore, the analyses suggest an increase in the impact of perceived sacrifices on the global perceived value ($\beta_{t_0} = -0.022, n.s.$; $\beta_{t_1} = -0.137, p < 0.05$). The difference calculated between the two coefficients between t_0 and t_1 is significant ($\Delta\beta = +0.115$). Therefore, for these readers, whereas the influence of perceived sacrifices on the global perceived value is non-significant in t_0 , when they use only one fixed e-channel and one mobile e-channel, it becomes significant in t_1 , with the addition of a second mobile e-channel. This result is in line with H2. Therefore, the addition of a second mobile e-channel worsens the usage phase for readers by significantly increasing the negative impact of sacrifices on the global perceived value. The adoption and usage of a second mobile e-channel, whose characteristics are similar to those of the first mobile e-channel, do not improve the perceived value. On the contrary, it creates a form of complexity that lessens the perceived value associated with the digital newspaper.

³ We also run analyses for the three other groups of readers (see Table 2). For these groups who showed stable behaviors by using the same number and types of e-channels, no significant differences between the coefficients were found between t_0 and t_1 .

In brief, the e-channel combinations affect the compositional model of perceived value through the perceived sacrifices, but they do not alter the influence of perceived benefits. These results therefore support H2 and reject H1. While these results only fully support one of the two hypotheses, they confirm the negative impact of the similarity of e-channels on the perceived value of a digital information product. The group of readers who used two mobile e-channels experienced a worse e-channel combination because the second mobile e-channel heightened the negative influence of perceived sacrifices and did not create additional utility in the usage phase. By contrast, the group of readers who combined a fixed and a mobile e-channel reported a higher perceived value, as the negative weight of perceived sacrifices was reduced, validating a complementarity effect between e-channels with distinct characteristics.

[insert Table 3 around here]

5. Discussion

5.1 Theoretical contributions

Our study contributes to the omnichannel literature. Basing on the customer journey model (Hossain et al., 2019; Lemon and Verhoef, 2016), this paper extends previous research by reintroducing a more ambivalent vision of omnichannel strategies through a focus on the usage phase and an investigation of this stage from a dynamic perspective. First, in a context that considers omnichannel strategies as a source of value creation throughout the customer journey (Verhoef et al., 2015; Xu et al., 2014), our study proposes a more nuanced vision in a digital environment. The omnichannel strategy can generate complexity and, accordingly, value destruction for customers, notably when they face myriad e-channels that not only constitute new means of accessing the offer but that also potentially become redundant. Second, we analyze the usage phase of the customer journey model, which remains an under-analyzed phase compared with the information search and purchase phases (Lemon and Verhoef, 2016). However, the usage phase is decisive for some products, such as digital information products, which are not only purchased but also consumed in an online omnichannel context (Karimi and Walter, 2015; Xu et al., 2014). In this context, we outline the critical role of e-channels and their combinations during the usage phase of the digital information product. Third, by investigating the usage phase from a dynamic perspective, this study captures the evolution of consumers' evaluations. As observed by Lemon and Verhoef (2016), measuring this dynamic effect as customer preferences change over time after repeated interactions with the offer and/or with various e-channels is fundamental.

This research proposed a theoretical framework intended to supplement existing works on the value creation of e-channel combinations during the usage phase of the customer journey. If the empirical results obtained partially validate this theoretical framework, we demonstrate the negative effect of the similarity of e-channels on the perceived value formation of the digital information product. Thus, the use of similar e-channels does not create incremental value and may, on the contrary, generate undesirable consequences by increasing the negative weight of non-monetary sacrifices (i.e., psychological and temporal costs) on the perceived value. This situation may be explained by the millefeuille effect of e-channels, whereas individuals perceive channels as redundant, non-integrated, and ultimately generating value destruction (Avery et al., 2012; Berger et al., 2015; Herhausen et al. 2015). By underlying the role of (dis)similarity between myriad e-channels, this study contributes to examining the conditions of integration quality in a digital context. Specifically, if having multiple channels available to customers can be essential, our research moderates the importance of breadth of

channel choice and demonstrates the variability of e-channel appropriateness depending on the previous e-channels used by customers (Hossain et al., 2019, 2020; Sousa and Voss, 2006). Furthermore, among the antecedents of the compositional value model, the only significant variations between t_0 and t_1 come from the effects of perceived sacrifices on the perceived value. This result mirrors the dominant idea in the literature in which value is potentially created given the perceived benefits (Verhoef et al., 2015; Xu et al., 2014). However, the accumulation of e-channels can concomitantly heighten the effects of perceived non-monetary sacrifices and consequently affect the ability of omnichannel strategies to create value for customers. This result therefore underlines the key role of perceived sacrifices in a context where most models of value either do not consider costs or limit them to monetary costs (Kumar and Reinartz, 2016). These results therefore provide insight into the mechanisms of the creation and destruction of value that underlie omnichannel strategies.

5.2 Managerial implications

In managerial terms, our findings refine the conditions of value creation for an online omnichannel strategy for digital information products in a usage situation. Several contributions can guide companies, specifically those in the press sector, when establishing their strategy to exploit the increasing demand for digital information products and when improving the ways in which they manage their various e-channels.

First, the results obtained highlight the sensitivity of the consumer valorization process to perceived sacrifices when multiple e-channels are used. Whereas businesses tend to emphasize the relative advantages of multiple e-channel combinations (i.e., favor the maximization of perceived benefits by customers) in their marketing discourse, reassuring customers by communicating amply about the corresponding sacrifices is also important, which may be perceived as complex (i.e., minimize perceived sacrifices). To favor a rapid decrease in perceived (non-monetary) sacrifices, businesses should systematically attempt to improve customer education in order to enhance their evaluation.

Second, the study results could also prompt practitioners to question the utility generated by each e-channel proposed relative to existing e-channels. Therefore, a mobile e-channel—given its intrinsic characteristics and compared with a less mobile e-channel (e.g., desktop or laptop computers)—can generate original benefits for the user (spatial and temporal flexibility) and improve the customer journey (De Haan et al., 2018). By contrast, the specific utility of each additional e-channel integrated into a galaxy of existing e-channels, including similar e-channels, appears potentially less evident for customers. Basing on the commonly accepted view that customers value choice in the channels through which they communicate with a provider, managers might be tempted to propose an offer through all available channels and increase the breadth of channel choice (Sousa and Voss, 2006). However, the valorization of an online omnichannel strategy does not lie in the multiplication of interchangeable e-channels but rather in the utilization of complementary e-channels. To implement an integrated channel system, organizations must better manage the functional differences between their different channels (Hossain et al., 2019). In the case of mobile e-channels (smartphone and tablet), whose characteristics and usages are similar, the specific and complementary benefits between the e-channels proposed can be clearly conveyed to consumers to avert a potential deterioration of their valorization process.

Lastly, our results highlight the prominent role of multiple e-channels during the usage phase of the customer journey. The literature on customer journey management in this stage is

rather scarce, whereas for products such as digital information products, this stage is a key issue. Specifically, if businesses should provide support at every stage of the customer journey to offer a seamless experience across channels, our study outlines the complexity of the usage phase. Indeed, this stage comprises a multitude of interactions involving the customer, the product, and a variety of e-channels. Therefore, companies that focus on e-channel integration in this stage could help users determine which e-channels are best suited to their usage habits and which are best suited to meet their expectations.

5.3 Limitations and research avenues

The limitations of this study give rise to several future avenues of investigation. First, this work examined a single newspaper. Confirming the results obtained for other products in the press sector (i.e., similar products) and considering other categories of digital information products (e.g., cinema, publishing, video games, music) would be useful. In addition, if we control the individual factors by comparing the groups of our sample between t_0 and t_1 , further research could enrich the model proposed by considering at t_1 these individual factors (e.g., motivational orientation, attitude toward technology, innovativeness) and their importance within the analytical frameworks of perceived value and of behaviors in an omnichannel context (Konuş et al., 2008; Kumar and Venkatesan, 2005; Xu et al., 2014).

We also evaluated only the impact of the use of an additional (similar/dissimilar) e-channel on the perceived value model. However, how would this model be affected if, for example, consumers stopped using a similar channel between t_0 and t_1 ? Given the many limitations of attitudinal models, future research can evaluate the impact of the accumulation of e-channels in terms of behavioral consequences (e.g., time spent consuming the digital information product, e-channel abandonment rate). Similarly, an objective measure of the use of e-channels can be considered by examining cookies to limit potential memory biases linked to the self-reported variables analyzed in this research (Bucklin and Sismeiro, 2009).

Consideration of the measures of perceived similarity between e-channels (Zhang et al., 2018) can also clarify the effects of omnichannel strategies on the valorization process during the usage phase. In addition, while this research focuses on e-channels (e.g., computers, smartphones, tablets), it would be interesting, following Wagner et al. (2020), to consider the effects of multiple e-channel touchpoints (e.g., a mobile app or a mobile-optimized website provided for tablet or smartphone users). The use of a more analytical approach to the compositional model of perceived value could also capture the specific contributions of each e-channel to the valorization process. Consistent with the recommendations of Kumar and Reinartz (2016), an analytical approach would be particularly well suited to capturing the potential undesired consequences associated with an omnichannel strategy during the customer journey and to identifying the factors that underlie perceived costs and frictions for customers. Lastly, the longitudinal nature of the study may be extended both by multiplying the measures during the usage phase and by extending these measures beyond this phase to consider the entire customer journey model (Lemon and Verhoef, 2016). The perceived value derived during each phase of the journey could thus be evaluated.

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Figure 1 – Research model

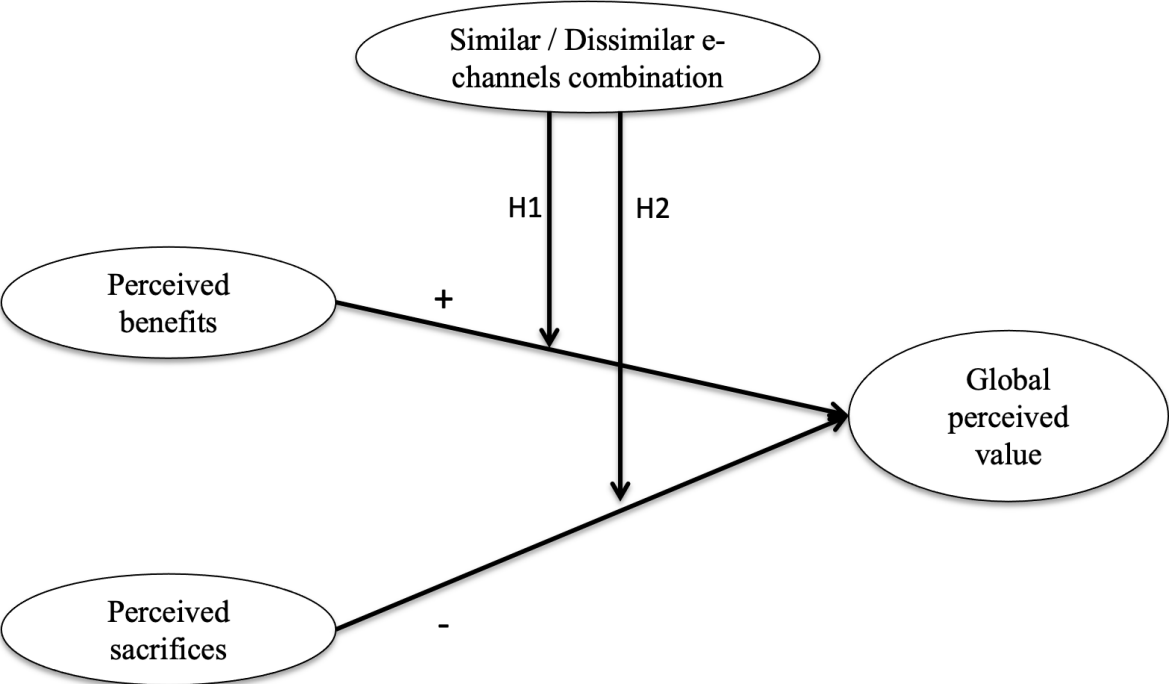


Table 1 – Recent empirical studies of the omnichannel strategy

Authors	Step of the customer journey analyzed			Channels analyzed		Time perspective	
	Information search	Purchase experience	Usage experience	Physical and digital	Digital	Cross-sectional study	Longitudinal study
Carlson et al. (2015)		✓		✓		✓	
De Keyser et al. (2015)	✓	✓	✓	✓		✓	
Herhausen et al. (2015)		✓		✓		✓	
Pantano and Viassone (2015)		✓		✓		✓	
Huré et al. (2017)		✓		✓		✓	
Rintamäki and Kirves (2017)		✓		✓		✓	
Barwitz and Maas (2018)	✓	✓	✓	✓		✓	
De Haan et al. (2018)		✓			✓	✓	
Zhang et al. (2018)		✓		✓		✓	
Flavián et al. (2019)	✓			✓		✓	
Hult et al. (2019)		✓		✓		✓	
Wagner et al. (2020)		✓			✓	✓	
Acquila-Natale et Iglesias-Pradas (2021)	✓	✓		✓		✓	
Current study			✓		✓		✓

Table 2 – Structure of the sample according to e-channels used

	Number (%)	E-channels used in t_0			E-channels used in t_1		
		Fixed e-channel (computer)	Mobile e-channel 1	Mobile e-channel 2	Fixed e-channel (computer)	Mobile e-channel 1	Mobile e-channel 2
<i>Not retained for further analysis</i>	141 (20%)	✓			✓		
	161 (23%)	✓	✓		✓	✓	
	173 (24.5%)	✓	✓	✓	✓	✓	✓
Retained for further analysis	Group 1 – 112 (16%)	✓			✓	✓	
	Group 2 – 118 (16.5%)	✓	✓		✓	✓	✓

Table 3 – Results of tests of significance of changes in path coefficients

Groups	t	Relationships studied	Path coefficients	t -values	p -values	Differences	Confidence intervals (CI)	Comparison of path coefficients t_1 with t_0 CI and path coefficients t_0 with t_1 CI	Path coefficients t_1 that fall within t_0 CI and path coefficients t_0 that fall within t_1 CI	Levels of significance of differences
Gr. 1, added a dissimilar (mobile) e-channel	t_0	Benefits $t_0 \rightarrow$ Value t_0	0.659	8.702	0.000	0.064	(0.509; 0.792)	$0.509 < 0.595 < 0.792$	Yes	No
	t_1	Benefits $t_1 \rightarrow$ Value t_1	0.595	6.601	0.000		(0.424; 0.780)	$0.424 < 0.659 < 0.780$	Yes	
	t_0	Sacrifices $t_0 \rightarrow$ Value t_0	-0.176	-2.508	0.014	-0.172		$-0.020 < -0.004$	No	Yes
	t_1	Sacrifices $t_1 \rightarrow$ Value t_1	-0.004	-0.052	0.958		(-0.134; 0.127)	$-0.176 < -0.134$	No	
Gr. 2, added a similar (mobile) e-channel	t_0	Benefits $t_0 \rightarrow$ Value t_0	0.631	9.009	0.000	0.082	(0.482; 0.764)	$0.482 < 0.549 < 0.764$	Yes	No
	t_1	Benefits $t_1 \rightarrow$ Value t_1	0.549	7.026	0.000		(0.405; 0.699)	$0.405 < 0.631 < 0.699$	Yes	
	t_0	Sacrifices $t_0 \rightarrow$ Value t_0	-0.022	-0.276	0.783	0.115		$-0.137 < -0.129$	No	Yes
	t_1	Sacrifices $t_1 \rightarrow$ Value t_1	-0.137	-2.159	0.032		(-0.253; -0.032)	$-0.032 < -0.022$	No	

Appendix A – Measurement instruments

Variables	Items
Functional benefits (Sweeney and Soutar, 2001)	This digital newspaper offers consistent quality This digital newspaper is well designed This digital newspaper offers acceptable quality
Social benefits (Sweeney and Soutar, 2001)	Reading this digital newspaper helps me feel accepted by others Reading this digital newspaper improves the way I am perceived by others Reading this digital newspaper makes a good impression on others
Emotional benefits (Sweeney and Soutar, 2001)	This digital newspaper is an offer I appreciate This digital newspaper makes me want to read it This digital newspaper gives me a sense of well-being
Non-monetary sacrifices (Mukherjee and Hoyer, 2001)	Reading this digital newspaper demands a lot of time Reading this digital newspaper demands a lot of effort Reading this digital newspaper demands a lot of energy
Global perceived value (Dodds et al., 1991)	Overall, I think this digital newspaper is well worth all the time and attention that one can dedicate to it Ultimately, reading this digital newspaper gives me more than it costs (in time, energy etc.) Reading this digital newspaper is well worth all the time and energy we spend on it

Appendix B – Descriptive statistics of the sample: demographic and psychologic variables

		Gr. 1, added a dissimilar (mobile) e- channel (n = 112)	Gr. 2, added a similar (mobile) e-channel (n = 118)
Sex	Men	67.9%	69.6%
	Women	32.1%	30.4%
Age	15-24	3.6%	6.8%
	25-34	7.1%	11.9%
	35-49	14.3%	18.6%
	50-59	16.1%	8.5%
	60-64	19.6%	6.8%
	More than 65	39.3%	47.5%
Socio- Professional Category	SPC-	1.8%	3.4%
	SPC+	41.1%	35.6%
	Retired	51.8%	45.8%
	Unemployed	5.4%	15.3%
Level of education	No diploma / High school graduate	16.1%	8.5%
	Bachelor degree	39.3%	25.4%
	Master degree / Professional degree / Doctorate degree	44.6%	66.1%
Household size	Mean = 1.98 S.D. = 0.920	Mean = 2.32 S.D. = 1.101	
Involvement with written press* (Alpha = 0.891)	Mean = 29.196 S.D. = 6.748	Mean = 27.170 S.D. = 6.708	
Innovativeness** (Alpha = 0.899)	Mean = 6.500 S.D. = 4.005	Mean = 9.780 S.D. = 4.740	

* measure based on Zaichkowsky (1985); ** measure based on Goldsmith and Hofacker (1991)

Appendix C – Reliability (CR), convergent (AVE) and discriminant validity

	<i>t</i>	Constructs	Number of items	CR	AVE	1.	2.	3.	4.	5.	6.
Gr. 1, added a dissimilar (mobile) e- channel	<i>t</i> ₀	1. Benefits <i>t</i> ₀	9	0.883	0.717	0.847					
		2. Sacrifices <i>t</i> ₀	3	0.878	0.707	0.265	0.841				
		3. Value <i>t</i> ₀	3	0.971	0.919	0.640	0.151	0.959			
	<i>t</i> ₁	4. Benefits <i>t</i> ₁	9	0.838	0.636	0.688	0.113	0.622	0.797		
		5. Sacrifices <i>t</i> ₁	3	0.888	0.730	0.220	0.532	0.037	0.187	0.855	
		6. Value <i>t</i> ₁	3	0.976	0.931	0.294	0.012	0.534	0.649	-0.059	0.965
Gr. 2, added a similar (mobile) e- channel	<i>t</i> ₀	1. Benefits <i>t</i> ₀	9	0.837	0.637	0.798					
		2. Sacrifices <i>t</i> ₀	3	0.918	0.790	-0.091	0.889				
		3. Value <i>t</i> ₀	3	0.965	0.903	0.536	-0.083	0.950			
	<i>t</i> ₁	4. Benefits <i>t</i> ₁	9	0.821	0.612	0.672	0.044	0.424	0.782		
		5. Sacrifices <i>t</i> ₁	3	0.922	0.799	0.114	0.680	0.047	0.175	0.894	
		6. Value <i>t</i> ₁	3	0.966	0.904	0.587	-0.001	0.486	0.684	-0.036	0.951

Notes: CR = Composite Reliability; AVE = Average Variance Extracted; The figures indicated on the diagonal represent the square root of the AVE; the other figures represent the correlations between the constructs.

Appendix D – Mean scores of value model for each group in t_0 and t_1

		Means t_0	Means t_1	t-values	Sig.
Gr. 1, added a dissimilar (mobile) e- channel	1. Benefits	36.55	35.3	1.721	0.088
	2. Sacrifices	9.93	5.5	13.432	0.000
	3. Value	15.63	18.22	-6.101	0.000
Gr. 2, added a similar (mobile) e- channel 2	1. Benefits	36.68	35.55	1.184	0.085
	2. Sacrifices	10.38	17.58	-13.151	0.000
	3. Value	14.77	11.48	8.717	0.000

Note: Means are computed on the final score of the variables.