Value co-production made easy: the role of fantastical thinking

Michela Addis
Department of Economics, Università degli Studi Roma Tre, Rome, Italy

Giulia Miniero
Franklin University Switzerland, Lugano, Switzerland and SDA Bocconi School of Management, Milan, Italy, and

Francesco Ricotta
Department of Management, Universita degli Studi di Roma La Sapienza, Roma, Italy

Received 8 September 2018
Revised 9 May 2019
24 October 2019
1 April 2020
30 May 2020
22 June 2020
Accepted 26 June 2020

Abstract

Purpose – The purpose of the paper is to investigate the role individual fantastical thinking (FT) plays in increasing the returns of value co-production by using technology-based services (TBSs).

Design/methodology/approach – This research combines 3 laboratory experimental studies with a survey, collecting data from 373 participants in total. An *ad hoc* customization Web-based tool – TBS - was created for the purpose of the studies.

Findings – FT increases the outcomes of value co-production via a chain reaction, as follows: FT increases the perceived ease of value-production; perceived ease of value coproduction increases enjoyment; enjoyment increases a broad range of key outcome variables of value co-production, namely, attitude and purchase intention toward the co-designed products; the number of interactions and time of interaction in the value co-production process, which measure its efficiency; expert perceived quality and novelty of the co-designed products; ordinary perceived quality and novelty, satisfaction and willingness to pay for the co-designed products.

Research limitations/implications – The procedure to activate FT requires relatively long training for participants, which might reduce the applicability of the procedure in other settings.

Practical implications – This study suggests a way to prevent failures in value co-production at the design stage mediated by TBSs. The proposed framework supports a decrease in task complexity for the consumer, thus reducing the stress experienced by participants. As a side effect, this study presents a useful framework to better highlight the benefits and costs associated with value co-production, thus making the return on investment measurement easier to perform.

Originality/value – The relevance of the findings to existing marketing literature lies in the advancement of knowledge related to value co-production processes by introducing the role of FT, a cognitive process designed specifically for consumer research and marketing.

Keywords Ease of use, Value co-production, TBSs, Enjoyment, Fantastical thinking

Paper type Research paper

1. Introduction

Co-creation has profoundly changed business management and marketing by implementing a participative approach in which consumers and firms cooperate to generate and develop meaning, knowledge, as well as new and better products (Ind and Coates, 2013; Prahalad and Ramaswamy, 2004; Ramaswamy and Ozcan, 2018; Vallaster and von Wallpach, 2013; Zaborek and Mazur, 2019). In fact, co-creation leverages consumer knowledge to develop new products (Baden-Fuller and Morgan, 2010; Bogers *et al.*, 2010) and focuses on the role of

European Journal of Marketing

0309-0566
DOI 10.1108/EJM-09-2018-0610

consumers as both innovators and consumers (Cossío-Silva *et al.*, 2016; Cova and Dalli, 2009; Cowan and Ketron, 2018) and the consequent benefits for other consumers. According to Ranjan and Read (2016), such collaboration refers either to value co-production (i.e. consumer–firm interaction based on the mutual exchange of physical and mental resources) or value in use (i.e. a post-purchase consumer evaluation of products based on aptitudes and knowledge). In both kinds, however, collaboration can prove to be so difficult for consumers that it results in lower levels of participation (Laukkanen, 2016). In these conditions, where stress and frustration are an issue (Gebauer *et al.*, 2013), a decrease in consumer stress increases the performance of value co-production (Cristol and Sealey, 2000). The level of consumer stress derives from not only the intrinsic complexity of the value co-production process but also its increasingly widespread technological component. Indeed, from a managerial perspective, firms have over time adopted technological platforms as enablers of value co-production by attempting to simplify consumer–firm interactions. Digital technologies, virtual worlds – i.e. online discussion forums, social media, Web 2.0, knowledge bases, messaging tools, virtual prototypes and realities, innovation toolkits, etc. – and, more recently, smart objects provide interactive platforms that allow companies to collaborate with consumers, enhancing their interactional capacity (Berthon *et al.*, 2012; Claffey and Brady, 2014; Cowan and Ketron, 2018). Such platforms, also known as technology-based services (TBSs), are systemic environments that offer additional resources to create fluid and valuable interactions among artifacts, processes, interfaces and personas (DeLanda, 2016; Ramaswamy and Ozcan, 2018), allowing consumers in this way to design their own products at a relatively low cost (Hoyer *et al.*, 2010; Sawhney *et al.*, 2005).

Unfortunately, these TBSs involve intrinsically high levels of complexity, representing as such a double-edged sword (Pires *et al.*, 2015): they potentially generate a significant increase in value by facilitating consumer participation (Franke and Piller, 2004), but at the same time, they demand higher levels of cognitive effort, especially for consumers who perceive a lack of coordinative ability (Etgar, 2008). When consumers struggle with difficult tasks, they can suffer lapses in concentration and thus perform badly. The generated workload stress might intensify the perceived sacrifices and complexity inherent in the co-creative process, leading to a decision not to co-create (Chan *et al.*, 2010; Heidenreich *et al.*, 2015; Hoyer *et al.*, 2010). In instances where they take part in the product's design, this might lead to confusion, dissatisfaction, annoyance and disappointment (Heidenreich *et al.*, 2015; Mitchell *et al.*, 2005; Mitchell and Papavassiliou, 1999); lower levels of enjoyment of the overall experience, including unfavorable or even uncompleted experiences (Norton *et al.*, 2012); lower perceived product utility (Dellaert and Stremersch, 2005); and higher demand for company or peer support. In summary, contrary to expectations, using TBSs may well lead to dissatisfactory performance (Chan *et al.*, 2010) and when this happens, co-production often turns into failure. Hence, designing better TBSs will support firms in avoiding dangerous and expensive failures in technology enhancement by making co-production easier (Dahl and Moreau, 2007; Franke *et al.*, 2009; Lunardo *et al.*, 2016; Ostrom *et al.*, 2015; Simonson, 2005).

Tackling this issue, our work focuses on the design stage of the co-production process with the aim of making it more successful. Specifically, our paper addresses the following research question:

RQ1. Does fantastical thinking (FT) improve the success of value co-production at the design stage?

We suggest that FT, a useful additional cognitive resource in relevant stressful situations, boosts consumers' cognitive abilities (Harris, 1994; Lynn and Rhue, 1986, 1988; Woolley,

1997). Indeed, FT is highly relevant in value co-production: it increases individuals' cognitive elaboration performance (Proulx and Heine, 2009) by reducing the perceived complexity of the process, resulting in an increase in the enjoyment experienced during the consumer–firm interactions. Therefore, this often leads to an increase in the returns of value co-production for both consumers and companies.

Our work extends the previous literature in three main ways. First, we propose a general and comprehensive framework of consumer–firm interactions and the returns of value co-production. The new framework leads to an extended understanding of the cognitive processes that individuals initiate to deal with TBSs when designing their own products. To our knowledge, prior empirical work has not simultaneously incorporated all kinds of return of value co-production, ranging from efficiency, quality and individual and market reactions. Second, our investigation tests the impact of activating FT in making value co-production easier and more enjoyable. The positive role of FT as a booster of cognitive elaboration, by providing evidence of its impact on key returns for firms, has never been explored in managerial processes. Third, our research shows that individuals can be effectively stimulated to activate their FT even in ordinary contexts. In summary, our paper elaborates on two main constructs – FT and value co-production – by contributing to understanding both of them. By linking psychological and marketing studies, our paper proposes and tests the previously unknown interconnections between fantasy and design.

Thus, first we elaborate on psychological literature to present FT as an additional cognitive resource that is useful when individuals deal with a relevant task but perceive it as difficult; second, we design a general framework for understanding the role of FT in value co-production; and finally, we develop hypotheses. The empirical analyses, by means of three experimental studies and one survey, reveal the contribution of FT to value co-production success. Discussions of the studies and managerial implications are then presented.

2. Fantastical thinking: an individual cognitive resource

FT is rooted in the concept of fantasy: a well-established construct in psychology defined as "the construction of alternative realities which intentionally violate the intuitive constraints of our ordinary understanding" (Johnson, 1997 p. 1025), and it is largely used throughout the individual life span (Harris, 1997; Kramer and Block, 2011; Woolley, 1997).

The experience of "deep, profound, and longstanding involvement in fantasy and imagination" (Lynn and Rhue, 1988, p. 35) is a common reaction in ordinarily uncertain and anxious situations (Langer, 1975; Muris *et al.*, 2003; Singer, 1961, 1966; Singer *et al.*, 1973). When individuals deal with stressful events, fantasizing largely supports coping strategies (Bacon and Charlesford, 2018; Greenwald and Harder, 1995, 1997), generating positive emotional outcomes (Bacon and Charlesford, 2018). Adaptive coping strategies search for thoughts and actions to solve problems and regulate emotions to decrease emotional distress (Folkman, 1984; Folkman *et al.*, 1986; Folkman and Moskowitz, 2004). Indeed, fantasizing stimulates new interpretations and understandings of the world around us (Woolley, 1997). Fantasizing is an elaborative activity based on cues and information that individuals have to confront (Klinger, 1977). Thanks to fantasizing, consumers experience the world differently and accept a broader realm of possibilities in story development (Keinan, 1994; St. James *et al.*, 2011; Woolley, 1997), helping them to cope with difficult situations. Thus, people are likely to perceive that they can change and modify the source of fear in a situation where they lack adequate information and knowledge (Keinan, 1994). In summary, fantasizing has been demonstrated to be an effective way to help individuals solve complex problems and reduce the stress that naturally arises in challenging situations.

Generally speaking, fantasizing has been largely studied both as a permanent personality trait, widely known as fantasy proneness (Wilson and Barber, 1982), and as FT, defined as a cognitive process that can be activated under specific circumstances, regardless of the level of individual fantasy proneness (Aspinwall and Taylor, 1997; Keinan, 1994; Woolley, 1997). FT is the process of thinking fantastically whereby individuals engage in FT when they take in behaviors, experiences or thinking that contradict the laws of nature, causing individuals to seek an escape from the real world (Lynn and Rhue, 1988; Harris, 1994; Keinan, 1994). By violating the commonly accepted views of reality (Boyer, 1997), FT makes individuals believe in causal relationships among concepts – abstract constructs, events, and so forth – that may well appear impossible in everyday situations. Specifically, when FT is activated it builds alternative worlds that might violate accepted views of reality, namely non-permanence, permeability, transmogrification, and animism (Hertzig and Farber, 1999).

Psychological studies have long recognized that when induced to fantasize people benefit from positive impacts both in children and adults (Weibel *et al.*, 2018). Thus, the construction of alternative realities might not only take its origin from unintentional error or ignorance but can also be an intentional act for a variety of purposes, such as theological, scientific, entertainment, and so forth (Johnson, 1997). When people suffer from a lack of control in significant situations they might engage in FT (Hertzig and Farber, 1999), helping them to cope with anxiety and fear and re-creating the "illusion of control" over things that matter to them when ordinary thinking knows that there is none (Bolton *et al.*, 2002). FT drive attitudes and behaviors (Klinger, 1977) and acts as an additional resource that boosts cognitive elaboration. For instance, Morewedge *et al.* (2010) found that when people imagine themselves eating some food, they become "virtually" used to the idea thus decreasing their actual consumption of food . Such a strong power of individual fantasy as a cognitive resource has also been found on the learning path. When FT is activated, individuals register better performances in their cognitive elaboration tasks (Proulx and Heine, 2009), like in the case of children who fantasize more reporting higher levels of theory-of-mind ability (Taylor and Carlson, 1997). To sum up, FT does not in any way threaten cognition but actively supports it.

3. Framework for understanding fantastical thinking in value co-production

This research proposes that the role FT plays in value co-production simplifies the whole process from the consumer's point of view, with great benefits both for the consumer and the firm (Figure 1).

The role of FT in value co-production is grounded in the relevance of value co-production benefits for the individual. From the consumer's point of view, value co-production generates a wide range of benefits related to self-designed products because it increases the perceived fit between consumer expectations and preferences. The resulting customized products can be related to functional, aesthetic, or self-expressive aspects. Functional customized products are those that are modified by consumers to enhance their performance; aesthetic customized products have enriched aesthetic appeal or pleasure (Franke *et al.*, 2010; Franke and Schreier, 2008); self-expressive customized products allow individuals to better express their identity (Franke and Schreier, 2008; Moreau *et al.*, 2011). Furthermore, the increase in consumers' ability to specify their preferences results in higher levels of customer satisfaction (Ouschan *et al.*, 2006). At the same time, the feeling of psychological ownership of products that are personally designed – known as the "I designed it myself" effect (Franke *et al.*, 2009) – allows consumers to express their innate desire to be unique and original (Franke *et al.*, 2010; Franke and Schreier, 2008). We propose

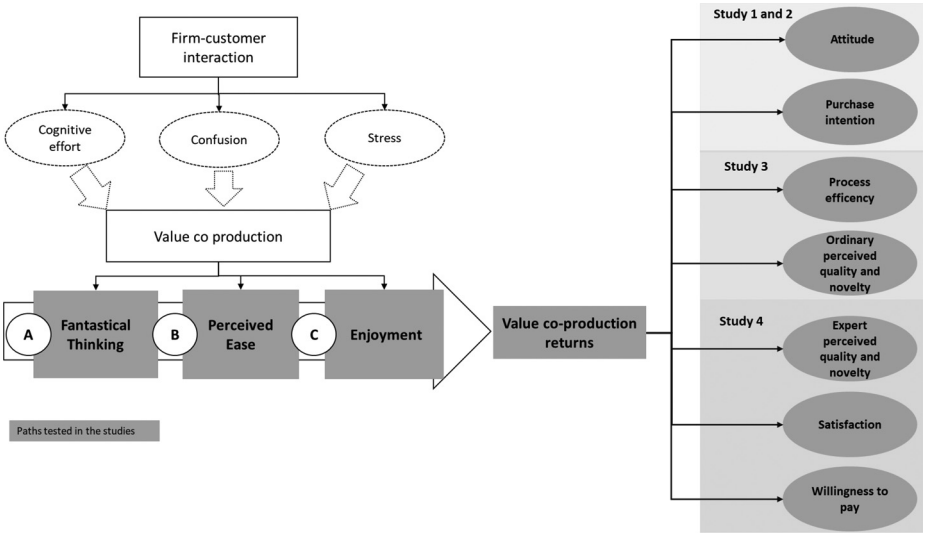

Figure 1.
Theoretical framework

that the benefits promised above increase individual concern, providing the premise for FT to be activated. In fact, the "induction principle" states that individuals only generate fantasy content when induced to do so by relevant cues related to their concerns (Klinger, 1977). These cues can be external or internal but in either case they must relate to people's concerns that in brief are states that represent a commitment to pursuing particular incentives. Individual concerns guide attention and set the individual's processing agenda (Simon, 1967). We propose that the expected individual benefits of value co-production may represent the necessary incentives to stimulate FT.

The simplifying effect of FT on value co-production refers specifically to its strong link with the perceived difficulty of TBSs used in value co-production. This potential threat to technology adoption can be reduced by FT. A vast body of research has been devoted to understanding technology adoption and user reactions. The diffusion of innovation theory (Rogers, 1962) has long inspired new product development scholars, with the technology acceptance model (TAM) (Davis, 1989; Davis *et al.*, 1989) still serving as a major operative template for information systems and marketing. The TAM has been continually revisited to incorporate a broader range of variables. However, its strength lies in high popularity, simplicity and robustness, in both the theoretical and the empirical investigation (Basoglu *et al.*, 2014; Lee *et al.*, 2003; Lu *et al.*, 2019; Venkatesh, 2000). Since its original formulation, the TAM has identified two key drivers at the very heart of behavioral technology acceptance: perceived usefulness, the degree to which a person believes that using the technology will enhance job performance, and perceived ease of use, or in other words the degree to which a person perceives a particular system as free of effort. Therefore, the TAM proposes that the perceived usefulness and perceived ease of use mediate any impact between external factors and individuals' reactions to technology (Davis *et al.*, 1989; Porter and Donthu, 2006; Venkatesh and Davis, 2000).

The strong positive impact of perceived ease of use on individuals' technology adoption, both as an attitude and as behavior, explains the relevance of the simplicity approach. FT contributes to this approach because, as already stated, it increases individuals' cognitive elaboration performance (Proulx and Heine, 2009). Thus, we suggest that FT acts as an

external factor of the TAM which supports individuals in dealing with the complexity brought about by the TBSs used in value co-production. The resulting decrease in tension when interacting with the TBSs in value co-production will lead to greater enjoyment of the entire process, even if the individual is still engaged in achieving a difficult goal. The enjoyment of using technology represents the individual perception that technology provides reinforcement in its own right, in addition to its impact on job performance (Davis *et al.*, 1989). The strong interconnections among fantasies and fun were theorized long ago in consumer research literature (Holbrook and Hirschman, 1982) and have recently emerged empirically in technological platforms (Cowan and Ketron, 2018; Cowan and Dai, 2014; Zsila *et al.*, 2018).

Enjoyment is conceptually distinct from key predecessors but its role in the TAM remains unclear (Ha and Stoel, 2009). Enjoyment has already been identified as a key variable in self-service retailing contexts (Dabholkar and Bagozzi, 2002; Weijters *et al.*, 2007) and in service contexts (van Dolen and de Ruyter, 2002). Generally speaking, enjoyment emerges as a key variable in interactions with technology, with a strong hedonic component (Bauer *et al.*, 2006; Kim and Forsythe, 2008a, 2008b). When interacting with entertaining digital platforms, individuals experience higher levels of enjoyment, a sense of achievement and, more generally, excitement. Fun derived from digital platform interactions boosts consumer belief in "new possibilities for their lives", stimulating them to achieve "goal-congruent outcomes that are not easy to accomplish" (Eisingerich *et al.*, 2019 p. 5). Consequently, any new technology, such as virtual reality, and any TBS where consumers contribute to co-production are expected to generate enjoyment as a key variable (Baron *et al.*, 2006; Manis and Choi, 2018; Oh *et al.*, 2009). Indeed, when individuals enjoy what they are doing, their thinking is more flexible, thus producing "unusual and innovative, though reasonable and logical, thoughts and responses" (Isen, 2000 p. 422) – they are more open to information, and their final decisions are more efficient and more thorough (Isen and Means, 1983).

4. Hypotheses development

We develop our hypotheses by considering the contribution that FT can make to individuals when dealing with co-production processes.

The expected benefits of value co-production:

- higher levels of perceived quality and customer satisfaction; and
- the "I designed it myself" effect – encourage consumers to react favorably to its outputs (Franke et al.., 2009, 2010; Franke and Piller, 2004; Schreier, 2006).

Subsequently, consumer reactions represent a key dependent variable in our study. In fact, we focus exclusively on the predecessors of co-production to explain the relationship with consequences that are commonly investigated in value co-creation such as product attitude and purchase intention toward the co-designed product (Schreier *et al.*, 2102). Both concepts express the valence of consumer behaviors which generate benefits from the consumers' point of view as in the model developed by van Doorn *et al.* (van Doorn *et al.*, 2010). As FT opens a possible, new world to individuals by letting them see solutions that were previously hidden, we expect a positive impact from FT on value co-production and propose the following hypothesis:

H1. Users in a high (low) FT state will show greater (lower) (*H1a*) attitude and (*H1b*) purchase intention toward the co-designed product.

Moreover, by stimulating individuals' cognitive FT process, consumers perceive the task as easy even if co-production is difficult by nature. We propose that the increased level of individuals' skills attributed to FT counterbalances the level of perceived difficulty of the task, resulting in better experiences. Indeed, we posit that individuals in a high (low) FT state will perceive the co-productive process as easier. The increased perceived ease regarding the task also has an effect on the enjoyment that individuals experience when dealing with the TBS. Indeed, enjoyment is strongly related to a decrease in stress which is brought about by the increase in perceived ease (Isen, 2000; Lazarus *et al.*, 1980), as well as also being a major factor in interactive experiences with technology (Bagozzi *et al.*, 1992; Bruner and Kumar, 2005; Chen and Tan, 2004; Lee *et al.*, 2005). Therefore, we also expect higher levels of individual enjoyment in the task, driven by perceived ease. This effect will lead to increased levels of positive attitudes toward co-designed products since individuals will perceive the entire process as easier and more fun. On the other hand, when the level of FT is low, individuals will not benefit from the cognitive boost it provides. Therefore, they will perceive the co-creative process as complex, resulting in less enjoyable experiences and this will negatively impact on their attitude toward co-designed products. Formally, *H2* addresses a series of mediators:

H2. The effect of FT on attitudes toward co-designed products will be mediated by the perceived ease of use, which in turn increases enjoyment.

Additionally, in order to better evaluate the contribution of FT to making the co-production process less complex, we look at the kind and amount of resources that consumers use from the firm's point of view (van Doorn *et al.*, 2010). Specifically, we assess the impact of FT on making the coproduction process more efficient, by measuring the length of time spent and the number of steps needed by consumers to interact. When individuals deal with any task, they voluntarily alter their behaviors and mobilize more resources in an effort to work more effectively and to be more efficient (Matthews and Wells, 1999). Interacting with technology demands of consumers a greater amount of time and effort (Sheng and Zolfagharian, 2014).

Psychological studies on the role of emotion in complex decision-making have already pointed out that individuals in a positive affect condition adopt significantly more efficient procedures in order to achieve their goals. Indeed, they display less confusion and a greater ability to integrate available information in taking significantly less time to complete their task and significantly reducing redundancy (Isen, 1999; Isen and Means, 1983). Such a finding is consistent with the results of Norton *et al.* (2012) which revealed that less time spent assembling and less contact with the product lead to a higher evaluation. Generally, an effective, simple approach decreases both the number of consumer decisions and steps needed to complete a task, as the analysis of successful customer experiences reveals (Cristol and Sealey, 2000). Thus, we propose the following hypothesis:

H3. Users in a high (low) FT state will show lower (higher) (*H3a*) number of interactions and (*H3b*) time of interaction.

Finally, we further extend our analysis of the effects of FT on value co-production to include benefits originating from consumer insights and ideas (i.e. their knowledge) for the advantage of any other current or potential customers (Alvarez-Milán *et al.*, 2018). Specifically, we look at the impact of FT on the quality of consumer knowledge generated by value co-production, assessing the quality and novelty of consumers' shared ideas which seek to improve, innovate and exploit firms' offering. Indeed, consumer knowledge is a key contributor in co-creation that is expected to provide companies with useful data resources,

leading to higher performance (Hsieh and Hsieh, 2015). We assess the quality of consumer knowledge embedded in co-designed products through experts' and ordinary consumers' perceived quality and novelty, and through ordinary consumers' satisfaction and willingness to pay. Since the vast majority of any market does not primarily reflect lead users (von Hippel, 1986), we have expanded the analysis to include ordinary consumers' responses.

Experts' perceived quality and novelty represent the opinions of specifically trained judges who evaluate the merits of these products. Three trained experts offer their objective assessments of the quality and novelty of co-designed products based on four different items (the overall quality and novelty index as in Moreau and Dahl (2005). Thus, their perspective represents a kind of "informed" perceived and objective quality and novelty.

Similarly, we assess market responses by interviewing other ordinary consumers, as members of the potential market, by asking them to evaluate co-created products in terms of perceived quality, novelty, satisfaction, and willingness to pay for said products. Hence, we propose the following hypothesis:

H4. Users in a high (low) FT design products with higher (lower) (*H4a*) experts' perceived quality and novelty, and (*H4b*) ordinary consumers' perceived quality, novelty, satisfaction and willingness to pay.

5. Empirical studies

The above hypotheses have been tested by conducting a comprehensive research project, involving a survey and three experimental studies run in a laboratory setting. This methodology was chosen as it allows for the testing of the causal effect of FT manipulation on dependent variables, as well as assessing this effect while ruling out potential confounding variables (Shadish *et al.*, 2002).

Experimental Study 1 specifically addresses *H1a* and *H1b*, demonstrating that FT enhances both attitude and purchase intention toward co-designed products. Such an effect is made possible by reducing perceived effort (perceived ease of use) and increasing enjoyment within the process, as successfully tested by Study 2 (*H2*). In addition, Study 3 specifically addresses *H3* by demonstrating that interacting via TBSs with individuals in a high FT (HFT) state is more efficient both in terms of length of time (*H3a*) and the number of needed interactions (*H3b*). Moreover, Study 3 reveals that co-designed products are of higher quality and novelty as assessed by trained experts (*H4a*). Study 4 investigates market performance as assessed by other consumers' reactions to the co-designed products generated by high and low FT individuals according to attitude, satisfaction, perceived novelty, and willingness to pay (*H4b*). For all the experimental studies presented herein, different groups of college students were engaged. Although the use of college students for consumer research is still a question of some debate, this is a standard practice (89 % of studies in consumer research, Peterson (2001) in the field).

5.1 Study 1

Study 1 seeks to test *H1a* and *H1b*, namely, that FT increases the level of attitude and of purchase intention toward co-designed products. A total of 45 students from an international business school took part in the study in return for course credits. The experiment had a one-factor (high vs low FT) between-subjects design. To the laboratory experiments more realistic, Study 1 is conducted employing a real online tattoo toolkit,

which was provided free of charge by an actual website that is no longer in business (www.tatmash.com).

The product category chosen for this study (i.e. tattoos) is regarded as an interesting context for designing products to be then made available. In fact, tattoos allow individuals to "design" their bodies, by expressing their notions of self, as their increasing popularity is especially common among young adults and adults (Totten *et al.*, 2009; Dalia Research, 2018). Further, today's creation processes are very sophisticated, allowing consumers not only to download tattoos from a range of possible products already available but to also design their own tattoos, (Kjeldgaard and Bengtsson, 2005), thus increasing the uniqueness of their design and realizing the value of co-production using TBSs.

The specific TBS adopted in value co-production allows individuals to generate and try tattoos by performing two primary activities: choosing among existing tattoo pictures or uploading a personal drawing; and seeing how the tattoo would look on their own body. By uploading a picture, it is possible to superimpose the designed tattoo on an image of their own body so that they can judge the potential outcome. As a result, consumers' bodies are modified as they have been co-created. One of the main pillars of this study is the degree of realism. In fact, by giving consumers the opportunity to evaluate the product – i.e. the picture that may become the tattoo – and its impact on their own bodies, we were able to define a setting that is very similar to a real context, thus increasing the realism of the study. At the end of the study, participants were provided with the picture of their own body part with their chosen tattoo superimposed.

5.2 Procedure

Prior to the experiment, participants were informed that the study focused on tattoos and sought greater insight on this product to possibly develop future market offerings. Participants were then asked to design their own virtual tattoo. Then, to take part in the study, participants were asked in advance to bring to the laboratory a picture of the body part where the virtual tattoo would be drawn but different from the tattoo that would instead be designed in the laboratory. They were also told that the picture of their body would be completely private and that nobody would be allowed to view it. When necessary, participants had a picture taken by a laboratory employee using a digital camera.

Once participants had arrived, the experimental procedure proposed the introduction of FT manipulation aimed at activating (or not activating) their cognitive FT process. Participants were randomly assigned to one of the two FT conditions: in the HFT condition, participants were involved in training aimed at inducing waking fantasies, as done in analytical psychology (Faber *et al.*, 1983). The training is based on the Guided Affective Imagery Technique developed in psychoanalysis (Leuner, 1969) but which has also been suggested in a few marketing studies (MacInnis and Price, 1987). Participants were encouraged to use their ability to fantasize and were told that fantasy is an excellent way to achieve personal and professional success. After a soothing video, participants were first invited to relax and abandon themselves to their imaginations, and then they were then trained to apply six specific autogenic techniques for generating hypnagogic imagery using the symboidraniatic method [1]. For example, participants were trained in how to stimulate their fantasies by visualizing a symbolic character about whom they had pleasant feelings, or another symbolic character that they feared, or, further, by imagining feeding this figure as a way to familiarize themselves with it. Moreover, participants read a detailed description of the concept of FT, its relevance, and how people can activate it.

By contrast, in the low FT condition (LFT), participants activated their analytical abilities by being trained in computing and breaking down the market share of a company.

Afterwards, they were asked to perform these tasks on a specific company for which proper data was provided. Thus, by applying proper computation and following the instructions provided, their level of FT should not in any way be active as the exercise relied exclusively on computational abilities (as opposed to imaginative ones) and they were asked to comply with the normal constraints of their instructions. Both conditions of manipulation have been tested in previous studies (not shown here) and have proven to be successful with regard to the Creative Experiences Questionnaire – (Merckelbach *et al.*, 1999) as a manipulation check for individual FT, consistent with previous literature analysis ($M_{HFT} = 4.23$, $M_{LFT} = 3.07$; $t(43) = 8.494$ $p < 0.001$).

After activating FT (or not), participants were asked to draw a picture of their desired tattoo. They completed the drawing on a graphic tablet which had previously been placed on the desk and connected to computers and was now at their disposal. A very user-friendly graphic software of the kind commonly available – namely, Microsoft Office Paint – let them change the color, shape, size and any other graphical detail of their own design, according to specific instructions made available for novice consumers. Once the image was created, they uploaded their own picture and drawing on the tattoo configurator, and if necessary made a few more changes to ensure that the outcome was as close as possible to their expectations. Again, specific ad-hoc instructions on the TBS used in the value co-production were distributed, which proved to be easy to follow in a pre-test dry run with both expert and novice consumers in virtual graphic design [2]. When participants felt their co-production process was complete, they sent the resulting assembled picture (i.e. their own picture with their own created tattoo) to their own email account and, finally, they answered a few questions on dependent variables. In the meantime, all the created images were automatically stored on the platform.

The study had 2 dependent variables: product attitude and purchase intention toward the co-designed products. Attitude was measured using three questions on a seven-point Likert scale (the anchors were "dislike vs like," "bad vs good" and "not appealing vs appealing") adapted from the scale used by Schlosser and Shavitt (2002). Reliability checks indicated a strong Cronbach's alpha of 0.926. Purchase intention was measured using one item on a seven-point scale, as in Valenzuela *et al.* (2009). All the measurement scales used for the four studies are shown in Table 1.

5.3 Results

A *t*-test for independent groups was conducted to compare both attitude and purchase intention in high FT and low FT. There was a significant difference in the scores for high

Table 1.
Measurement scales for all constructs employed in the studies

Scale	Authors	Items	Study	Validity
CEQ (Creativity Experience Questionnaire)	Merckelbach *et al.* (1999)	25	Study 1	$\alpha = 0.884$
Attitude	Schlosser and Shavitt (2002)	3	Study 1; Study 2	$\alpha = 0.926$
Purchase Intention	Valenzuela *et al.* (2009).	1	Study 1	
Ease of use	Insko *et al.* (1973)	3	Study 2	$\alpha = 0.803$
Enjoyment in the task	Dahl and Moreau (2007)	6	Study 2	$\alpha = 0.903$
Novelty	Moreau and Dahl (2005)	3	Study 3	$\alpha = 0.80$
Novelty	Finke (2014).	1	Study 4	
Satisfaction	"How satisfied you are with the Tshirt created?"	1	Study 4	
Willingness to pay	Wertenbroch and Skiera (2002)	1	Study 4	

fantastical thinking (M_{HFT} = 3.2; *SD* = 1.144) compared to low FT (M_{LFT} = 2.28; *SD* = 0.847); ($t(43) = -3.097$; $p < 0.005$) for product attitude. Similarly, a significant difference in the score of FT on purchase intention was found, as expected (M_{HFT} = 3.32; *SD* = 1.128; M_{LFT} = 2.35; *SD* = 0.914; $t(43) = -3.235$; $p < 0.005$), confirming *H1* (both *H1a* and *H1b*). The partial correlation between attitude and purchase intention equals 0.668 ($p < 0.001$). Results are shown in Figure 2.

5.4 Discussion

Study 1 reveals that consumers whose FT has been activated (HFT condition) better appreciate the direct outcome of their interaction with TBS in value co-production (i.e. the product they have created) than consumers who did not perform FT activation training (LFT condition). By demonstrating higher levels of positive attitude and purchase intention toward tattoos when stimulated by FT, consumers' appreciation of the product increases, confirming that FT has an effect on the performance of the co-productive TBS. The results obtained in Study 1 show the potential for utilizing FT capabilities in the context of value co-production processes. Indeed, the need to reduce consumers' perceived effort and its effect on the enjoyment of the task to generate more positive co-creative experiences remains to be addressed. To analyze such an effect, Study 2 was conducted.

5.5 Study 2

Eighty students from an international business school took part in the experiment in return for course credits. The experiment had a one-factor (HFT vs LFT) between-subjects design. The procedure was similar to Study 1 except for the addition of two variables – namely, ease of use and enjoyment in the task. The ease of using the TBS in value co-production was measured by the perceived cognitive effort (Insko, 1967) on three questions scored using a seven-point Likert scale immediately following FT manipulation. The anchors of the scale ("1 = difficult, 7 = easy"; "1 = tiring, 7 = relaxing"; "1 = strenuous, 7 = restful") show that for higher scores, the process is perceived as simpler. The items measuring the perceived ease of using the toolkit were highly correlated (Cronbach's α = 0.803) so that the average was calculated to form a unique indicator. Enjoyment in the task was measured as seen in Dahl and Moreau (2007) by asking participants the degree to which they enjoyed the creative process, how fun and satisfying the process was, and how annoyed and frustrated they felt during the task (reverse scored) (Cronbach α = 0.903). All items were loaded onto a single distinct factor, so we averaged them to create an enjoyment index (α = 0.89). Thanks to the

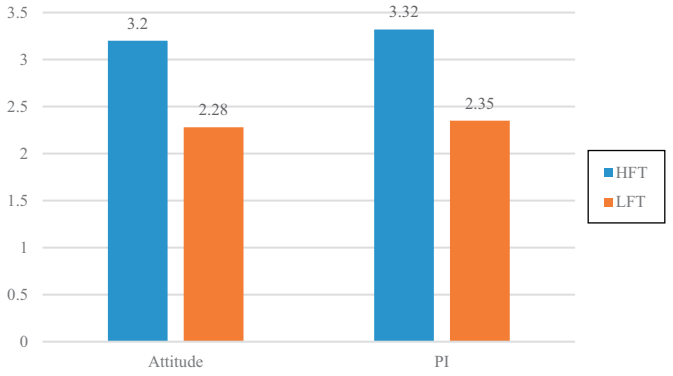

Figure 2.
Results of Study 1: difference of FT on attitude and purchase intention

strong correlation between attitude and purchase intention, due to the need to test a complex chain reaction and for the sake of brevity, findings for Study 2 are only shown for one dependent variable – i.e. attitude, the one measured more rigorously through three items – to ensure simplicity without losing efficacy. Results of the same chain of effects tested on purchase intention are not shown here but are available upon request from the authors.

5.6 Results

First, the results of Study 1 were replicated: an independent sample *t*-test of FT on attitude toward the co-designed products was performed. As expected, the *t*-test is significant ($t(78) = -2.393$, $p < 0.05$), indicating that individuals in a high FT condition developed significantly more favorable attitudes toward their own co-designed products ($M_{HFT} = 4.05$, $SD = 1.4$) when compared to individuals in the low FT condition ($M_{LFT} = 3.22$, $SD = 1.84$). The FT manipulation's effectiveness was also checked through two manipulation tests that assessed the "proneness to fantasize" and "how much the participants felt imaginary at that moment" (where 1 = not at all and 7 = a lot). The procedure resulted in participants in the HFT condition showing a statistically significant higher level of FT activation for both items ($M_{HFT} = 4.92$ $M_{LFT} = 3.65$ $p < 0.000$ and $M_{HFT} = 5.12$ $M_{LFT} = 4.22$ $p < 0.005$, respectively).

A further analysis was then performed using perceived ease and enjoyment as mediators, FT as the independent variable, and attitude toward co-designed products as the dependent variable. The bootstrapping approach [3] suggested by Zhao *et al.* (2010) was adopted to test the mediation. It does not assume multivariate normality of the sampling distribution of total and specific indirect effects – a process that simultaneously increases power and maintains reasonable control over the Type I error rate (Hayes, 2013, Model 6 [4]). The evidence revealed mediation by perceived ease and enjoyment of the effect of FT on attitude.

The direct effect of FT on attitude is not significant (c= −2709 95% C.I. −0.4042 − 0.9460). The *b* path, namely, the respective impact of ease of use and enjoyment on attitude, is positive and significant (ease of use: $b = 0.4251$, $p < 0.05$, 95%C.I. (0.1707−0.6795); enjoyment $b = 0.4102$, $p < 0.01$, 95% C.I. (0.0999 − 0.706). The indirect effect via the two mediators is positive and significant at $c = 0.0936$ with a 95% C.I. excluding zero (0.0061− 0.3603). These results demonstrate that when FT is high, both perceived ease and enjoyment in the process increase. This in turn results in an increase in positive attitude toward the co-designed products, supporting *H2*. As the paths *a x b x c* are positive, it is an exclusively indirect mediator (Zhao *et al.*, 2010) (Figure 3, Table 2) .

5.7 Discussion

Study 2 shows that the perceived ease of use of TBSs and enjoyment mediate the relationship between FT and the attitude toward co-designed products, as proposed under *H2*. FT makes the value co-production process less difficult and more pleasurable, thus

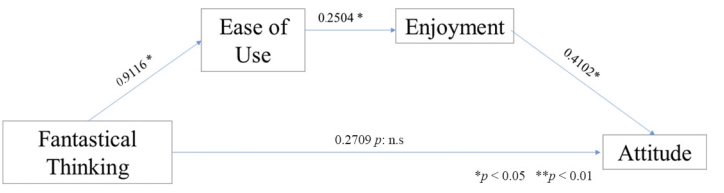

Figure 3.
Results of Study 2: perceived ease and enjoyment build the relationship between FT and product attitude

Predictor	Criterion	Path	Est	SE	P	CI 95% LL	CI 95% UL
X:FT	M1: Ease of use	a1	0.911	0.299	0.0023	0.3363	1.486
R^2			0.1131	1.653	0.0023		
X:FT	M2: Enjoyment	a2	0.5079	0.2410	0.0384	0.0279	0.9879
M1: Ease of Use		d2	0.2504	0.0889	0.0062	0.0733	0.4275
R^2			0.1932	1.023	0.0003		
X:FT	Y:Attitude	c	0.2709	0.3390	0.4266	−0.4042	0.9460
M1: ease of use		b1	0.4251	0.1277	0.0013	0.1707	0.6795
M2: enjoyment		b2	0.4102	0.1558	0.0103	0.0999	0.7206
R^2			0.3174	1.9075	0.0000		
Indirect Effects							
X to M1 to Y		a1 × b1	0.3875	0.1628		0.1323	0.8114
X to M2 to Y		a2 × b2	0.2084	0.1175		0.0267	0.5058
X to M1 to M2 to Y		a1 × d2 × b2	0.0936	0.0877		0.0061	0.3603
Total Indirect effects			0.6895	0.2185		0.3149	1.1784

Table 2.
Results of study 2: Perceived ease and enjoyment build the relationship between FT and product attitude

generating more favorable participant reactions. Therefore, this study confirms the mediating role of perceived ease of the technological toolkit (activated by FT) which boosts cognitive abilities and makes individuals perceive complex activities as being simpler (Etgar, 2008). Moreover, Study 2 confirms that the ease of use of TBSs in value co-production increases enjoyment in the process for individuals, with this resulting in an increase in positive attitudes.

The ease of the process and enjoyment emerge as crucial variables in which to invest to enhance positive product attitude, thus increasing the performance of the TBSs in value co-production.

These findings, however, are affected by a general limitation: Study 1 and Study 2 leverage subjective variables related to the most direct consumer contribution, which is measured by subjective indicators. Study 3 seeks to shed light on the efficacy of FT in empowering consumers to participate in co-productive activities by spending a smaller amount of their resources and contributing more valuable knowledge.

5.8 Study 3

Study 3 seeks to test whether FT enables consumers to better interact with the TBS used in value co-production by measuring the amount of time they spend interacting with TBS (*H3a*) and the number of activities they carry out before finalizing the product (*H3b*). In addition, Study 3 provides an empirical demonstration to determine whether individuals in a high FT state produce products of a higher value in the experts' opinion (*H4a*). This topic is especially relevant for companies that might benefit from having as an outcome products that objectively perform much better, and in so doing opening new and valuable learning opportunities.

The amount of resources spent by consumers while co-designing their products is measured objectively via process performance which refers to the actual complexity of the process as revealed by the activities carried out by participants. To gather data on the performance of the interactive process, Study 3 had to change the setting of the experimental context, moving to an ad-hoc, made to purpose toolkit. We developed a new and specific TBS to allow consumers to design their own stickers. By drawing their own image of a

desired sticker on a graphic tablet, participants could use the co-productive TBS to change color and shape, to rotate and also to add writing, signs and other symbols. Such a co-productive TBS overcomes three limitations found in Studies 1 and 2:

- employing an artificial ad-hoc TBS ensures a controlled and safe environment for our experiment so that participants could focus on the task with no distractions;
- by analyzing a different product category (stickers instead of tattoos), the external validity of our research is increased while maintaining satisfactory interest for participants that still fits with the product category; and
- the *ad-hoc* TBS also allows for the collection of process measures that were not publicly available when using an existing configurator that could not assess the objective performance of the process.

Specifically, in Study 3 we assess the co-production process in two different ways:

(1) by investigating the efficiency of the co-production process; and

(2) by addressing the quality and novelty of participant output as perceived by three trained experts.

With regard to efficiency, we identified a few steps that comprise the co-productive process – changing and choosing the color of the image, adjusting its shape (e.g. rotation, scaling) and selecting it – and we then gathered data to monitor the length of time and frequency for all of them. We timed the seconds spent (time) by each consumer on the interactive steps of the TBS and the number of actions (frequency) taken for each step, and we then created two new measures – "process_time" and "process_frequency" – used as additional dependent variables to test *H3* (a and b). We measured the process in terms of length of time and steps needed between the exact moment when each participant started the co-productive process until they ended the process fully satisfied with the final result created. No pressure was exerted so that the participants were free to decide when the final result was satisfactory in their opinion. We expect consumers in a high FT condition to complete their co-designed products in a shorter period of time and to employ fewer actions as the additional cognitive resource (i.e. FT) boosts their abilities and makes them more capable of facing the challenge.

With regard to the value of the knowledge output generated by consumers, we measured this through an assessment of quality and novelty by experts following Moreau and Dahl (2005), asking three design experts to rate all the products co-designed by participants. Such a methodology to assess the objective quality and novelty of the created products is common in the creativity stream of research (Goldenberg *et al.*, 1999; Moreau and Dahl, 2005; Plucker and Renzulli, 1999). The three invited judges are employed senior design professionals, who evaluated all the resulting designs. All currently hold positions as product designers and have extensive experience in consumer product design. They were blind to the students' identities, to one another's identities, to the purpose of the experiment, and also to the origin of the stickers (whether they were the result of a high or low FT condition). Three separate booklets were prepared, each including a total of 40 designs produced in a different and random order. Judges were randomly assigned to one of the booklets and worked individually at their own speed in their ratings. Judges were asked to rate each design on the three-item novelty index according to originality, creativity and innovativeness.

We also asked the judges to provide an evaluation in terms of the overall quality of the products. As stated, the three judges were blind to the study's goal and were only briefed on the meaning of the measures employed. The judges then assessed the stickers autonomously. Specifically, they were not even aware that other individuals were dealing

with the same task of evaluating the products and therefore, they did not discuss it. Our goal was to gather independent data about these variables and, as was the case in a study conducted by Moreau and Dahl (2005), their evaluations on the three items proposed were averaged to form a unique indicator (namely, novelty) for each design solution (all $\alpha > 0.80$). Quality assessment was considered separately. After completing the ratings, the judges were thanked and compensated for their participation.

These variables were later gathered and included in the dataset for the analyses to test *H4a*; Table 4 provides the complete list of measures included.

5.9 Procedure

A total of 88 students from an international business school participated in the study in return for course credits. The procedure was similar to Studies 1 and 2 but differed in terms of the technological platform: this time participants did not receive any invitation to bring their own pictures because of the new product category. Thus, after the usual FT manipulation, participants were asked to draw the image they wished for as a sticker by using a graphic tablet and to create it through the platform. The task for participants in high FT and the task for participants in low FT were exactly the same, and all participants were invited to focus only on the design of their own sticker. After drawing and creating the final version of their image, they responded to the dependent variables on their output – a real and ready-to-use print of their own stickers on adhesive paper – and were then thanked and allowed to leave.

5.10 Results

A MANOVA analysis was run using FT as the independent variable and attitude, process time and process frequency, as well as perceived quality and novelty as dependent variables. As expected, the results are all significant and confirm both *H3* and *H4a* (Table 3).

5.11 Discussion

Study 3 supports *H3* (a and b) and *H4a*, confirming the role of FT in improving the efficiency and efficacy of coproduction processes. Specifically, individuals in a high FT state perform better in co-producing their own products because they employ a smaller quantity

		Mean	SD	*F*-test	Sign
Attitude	Low FT	3.54	1.64	3.063	0.084
	High FT	4.12	1.43		
	Total	3.84	1.56		
Quality	Low FT	3.18	1.25	3.346	0.071
	High FT	3.72	1.50		
	Total	3.45	1.40		
Novelty	Low FT	3.08	1.27	5.794	0.018
	High FT	3.82	1.57		
	Total	3.45	1.47		
Process Time	Low FT	29.29	27.56	13.531	0.000
	High FT	13.05	9.79		
	Total	21.08	22.04		
Process Frequency	Low FT	2.62	1.48	8.191	0.005
	High FT	1.85	1.00		
	Total	2.23	1.31		

Table 3. MANOVA Results on performance rated by external judges

Fantasy Proneness	Factor Loadings		AVE	CR
Component 1	As a child, I could very easily identify with the main character of a story and/or movie.	0,66	0,37	0,73
	As a child, I sometimes had the feeling that I was someone else (e.g. a princess, an orphan, etc.)	0,57		
	Many of my friends and/or relatives do not know that I have such detailed fantasies	0,63		
	Many of my fantasies have a realistic intensity	0,60		
	Many of my fantasies are often just as lively as a good movie	0,64		
	I often have the feeling that I can predict things that are bound to happen in the future	0,56		
Component 2	Sometimes I act as if I am somebody else and I completely identify myself with that role	0,58	0,47	0,78
	I sometimes feel that I have had an out of body experience	0,62		
	When I sing or write something, I sometimes have the feeling that someone or something outside myself directs me	0,77		
	During my life, I have had intense religious experiences which influenced me in a very strong manner	0,77		
Component 3	When I perceived violence in television, I get so into it that I get really upset	0,78	0,61	0,82
	When I think of something cold, I actually get cold	0,80		
	When I imagine I have eaten rotten food, I really get nauseous	0,75		
Component 4	As a child, I devoted my time to playing a musical instrument, dancing, acting and/or drawing	0,72	0,55	0,74
	I spend more than half the day (daytime) fantasizing or daydreaming	0,67		
	I often confuse fantasies with real memories	0,56		
	I am never bored because I start fantasizing when things get boring	0,61		
Component 5	As a child, I thought that the dolls, teddy bears, and stuffed animals that I played with were living creatures	0,71	0,17	0,77
	As a child, I strongly believed in the existence of dwarfs, elves and other fairy tale figures	0,74		
	As a child, I was encouraged by adults (parents, grandparents, brothers, sisters) to fully indulge myself in my fantasies and daydreams	0,73		
Component 6	As a child, I had my own make believe friend or animal	0,62	0,51	0,67
	As a child, I often felt lonely	0,80		
Component 7	When I recall my childhood, I have very vivid and lively memories	0,76	0,62	0,76
	I can recall many occurrences before the age of three	0,82		

Enjoyment			
Factor ladings		AVE	CR
I enjoyed during the process	0.85	0.67	0.67
I had a good time during the process	0.93		
The process was satisfactory	0.91		
I had fun during the process	0.76		
I felt frustrated during the process (–)	−0.72		
I felt annoyed during the process (–)	−0.72		

Table 4.
Factor loading and composite reliability for the scales

(*continued*)

Novelty			
Factor loadings		AVE	CR
The output is original	0.83	0.64	0.84
The output is creative	0.74		
The output is innovative	0.83		
Attitude			
Factor loadings		AVE	CR
I think the product is good	0.90	0.83	0.94
I have a favorable opinion of the product	0.94		
I think the product is pleasant	0.89		
Ease of Use			
Factor loadings		AVE	CR
My activity was easy	−0.68	0.54	0.35
My activity was relaxing	0.75		
My activity was restful	0.78		

Table 4.

of resources. Participants in the HFT condition ended the value co-production process and saved their own stickers sooner than individuals in the LFT condition. These findings emerge with an *ad-hoc* TBS used in the value co-production – this allowed for the control of any bias by using an existing, online configurator, thus strengthening the external validity of our research.

Moreover, the TBS enabled us to measure specific process variables, such as the time spent creating and modifying the product and the number of interactions undertaken to complete the creative process. Thanks to these measurements, we were able to establish that FT allows individuals to perform their interactions faster and to achieve the final outcome by employing fewer steps. This is additional confirmation of the cognitive resources activated by FT, since it allows individuals to save both time and energy, and in so doing indirectly generating benefits also for companies. Indeed, interactions with TBS are more efficient if individuals' abilities are boosted through the stimulation of FT and thus become of higher value. Moreover, we measured the output value of consumer knowledge generated through the value co-production process and found that individuals in a high FT condition perform better, creating (fairly significant) higher quality and novel outcomes, as interpreted by three externally trained experts.

However, measuring quality is a difficult task, especially for hedonic products, and the assumption that quality leads to acceptance of the market cannot be taken for granted. Therefore, a deeper investigation of the impacts of FT on co-designed products as perceived by the market is still required. Indeed, the link between FT and the knowledge created by users in the co-production process, which could be more favorably accepted by the market, is anything but a foregone conclusion. Study 4, therefore, focuses on market reactions (*H4b*).

5.12 Study 4

5.12.1 Procedure. Study 4 builds on the findings of Study 3 by investigating other individuals' reactions to the co-designed stickers generated during Study 3. A selected sample of stickers created by individuals in the previous study acted as stimuli in Study 4. A total of 20 stimuli were selected from the full range of stickers (40 in total) by choosing the first 10 stickers generated by individuals in HFT and the first 10 stickers generated by individuals in LFT, according to their ranking by expert assessment in terms of novelty and overall quality. The full range of 20 stickers was administered to a sample of 160 participants recruited randomly from two international business schools. In fact, the smaller

the sample, the lower the likelihood of the results being statistically significant (Wooldridge, 2009, p. 121). Such a sample represents potential consumers as they were invited to rate the co-designed products but were blind to the purpose of the experiment, as commonly done in previous studies on creativity (Dahl and Moreau, 2002; Goldenberg *et al.*, 1999; Moreau and Dahl, 2005; Plucker and Renzulli, 1999). The sample is comprised of men (66 %) and women (34 %), with an average age of 22.12 years ($SD = 0.473$).

Each participant was asked to rate T-shirts featuring the drawings (stickers) completed by the participants in the previous study. In summary, the participant visualized a white T-shirt with a sticker on it. They autonomously assessed 20 T-shirts randomly presented, assessing them at their own pace using the following scale:

- novelty of the sticker, measured by 1 item on a seven-point Likert scale (Finke, 2014);
- attitude toward the use of a T-shirt with the printed sticker, measured by one item on a seven-point Likert scale;
- satisfaction with the T-shirt created, measured as one item on a seven-point Likert scale; and
- the price participants would be willing to pay for the T-shirt measured in Euros - specifically, we asked: "How much would you be willing to pay for your T-shirt?" as suggested by Jones (1975) and replicated by Wertenbroch and Skiera (2002). Such an approach for measuring willingness to pay is based on a contingent evaluation of price matching in decision-making literature, and thus it is preferable to other (still possible) methods.

The image of the T-shirt used was primarily neutral, with white as the main color, but it could also be changed by participants. The T-shirt image used was the same for each of the 20 stickers compared.

5.12.2 Results. After a preliminary test for the unidimensionality of the scales used to measure the degree of perceived novelty ($\alpha = 0.897$), a one-way ANOVA with repeated measurements was performed to test differences in novelty, attitude, satisfaction, and willingness to pay for stickers generated under HFT vs LFT conditions. As expected, there was a statistically significant effect of FT on novelty ($F(1,159) = 534{,}29$, $p < 0.001$), indicating that individuals rate co-designed stickers created under high FT more novel than stickers created under low FT ($M_{Nov\text{-HFT}} = 3.38$, $SD_{NOV\text{-HFT}} = 1.06$; $M_{NOV\text{-LTF}} = 2.23$, $SD_{NOV\text{-LTF}} = 0.87$). Similarly, stickers created under high FT result in a higher degree of positive attitudes ($M_{ATT\text{-HFT}} = 2.87$, $SD_{ATT\text{-HFT}} = 1.05$; $M_{ATT\text{-LTF}} = 1.93$, $SD_{ATT\text{-LTF}} = 0.77$, $F(1,159) = 249.00$, $p < 0.001$) and higher levels of satisfaction ($M_{SAT\text{-}HFT} = 2.74$ SD = 1.05, $M_{SAT\text{-}LFT} = 1.83$ SD = 0.77, $F(1,159 = 247.02$ $p < 0.000$). More importantly, they are associated with a greater willingness to pay ($_{WTP\text{-HFT}} = 6.84$, $SD = 5.2$; $M_{WTP\text{-LTF}} = 3.99$ $SD = 3.91$) ($F(1,159) = 219.4$, $p < 0.001$).

5.12.3 Discussion. Study 4 confirms the impactful power of FT and its relevance when dealing with the complexity of interactions with TBSs in value co-production. Specifically, our findings suggest that consumers are willing to pay a premium for products developed under FT stimulation, thus increasing the "money on the table" available to companies. Our data confirms on a large scale that boosting FT increases both attitude and satisfaction toward the co-designed products and, at the same time, generates a feeling of greater novelty. Combining these two conditions, firms can leverage these relevant increases in willingness to pay and customer satisfaction.

6. General discussion

Value co-creation is one of the most innovative approaches that firms can adopt to create new products and manage their customer relationships. It assumes that individuals play a dual role, namely, as both consumers and innovators and such a collaborative contribution can take place either with regard to co-production or use. This research focuses on the former, a mutual exchange of physical and mental resources between the firm and the consumer (Ranjan and Read, 2016). By integrating consumers in their processes firms obtain access to their ideas, aiming at generating broad and important managerial and marketing expectations and benefits (Fuchs and Schreier, 2011; Chan *et al.*, 2010). To that end, firms have invested heavily in TBSs aimed at providing consumers with platforms to efficiently design their own products which sometimes, however, fails. In fact, collaboration in TBSs may well generate high levels of stress and anxiety in consumers due to their intrinsic complexity that may in turn lead to lower levels of participation. So, what can firms do in such situations? Our research addresses this issue and proposes an effective way to make value co-production easy and enjoyable: by activating FT. Our study suggests that FT might resolve the issues related to high levels of perceived difficulty when interacting with TBSs during co-production at the design stage, thus boosting its performance.

Specifically, our research contributes to a better understanding of value co-production at the design stage with regard to three main aspects. First, we propose a new framework that will lead to an extended understanding of the cognitive processes that are activated when consumers design their own products with TBSs. Perceived cognitive effort is a key obstacle for every such activity in that tasks that are too difficult might increase workload stress and frustration thus lowering overall performance (Gebauer *et al.*, 2013) and co-production is no exception to this general rule (Cristol and Sealey, 2000; Laukkanen, 2016). This is typically the case in co-production based on TBSs, which are inherently high complex platforms (Chan *et al.*, 2010; Dahl and Moreau, 2007; Franke *et al.*, 2009; Heidenreich *et al.*, 2015; Hoyer *et al.*, 2010; Lunardo *et al.*, 2016; Ostrom *et al.*, 2015; Pires *et al.*, 2015 Simonson, 2005). By leveraging on psychological studies that propose individual FT as an additional resource that supports individuals when dealing with difficult tasks, our research tests whether this resource, when properly activated, can help individuals to interact with TBSs. Across three experiments and a survey, we found support for the proposition that FT acts as an additional cognitive resource capable of making the co-production process at a design stage more successful and that, consequently, it generates an increase in the returns of value co-production for both consumers and firms. More specifically, our studies show that FT improves several success measures of co-production at the design stage: i.e. attitude, purchase intention, quality, novelty, satisfaction and willingness to pay [more]. Indeed, consumers activated with FT generate ideas, prototypes and products that are better assessed by their creators, more efficient and also better judged both by experts and other individuals. As those variables measure the return on investment (ROI) in value co-production, FT acts as a relevant driver of success. When FT is activated, the value of the final outputs of value co-production is higher: individuals produce co-designed products with higher quality and novelty, as assessed by our experts' opinions and by ordinary consumer reactions. Moreover, the latter also includes better responses in terms of satisfaction and willingness to pay. Thus, clear benefits for companies emerge.

Second, our research highlights the positive and powerful impact of activating FT when attempting to make consumers perceive value co-production as easier and more enjoyable. Value co-production via TBSs is a difficult task for individuals and demands a large amount of time and effort (Sheng and Zolfagharian, 2014): the more resources individuals have access to, the more efficiently they cope with the task (Matthews and Wells, 1999).

Individual FT increases cognitive elaboration performance, increasing the perceived ease of the value co-production process and enhancing the consumer-firm interaction. Thus, our research demonstrates the positive effect on consumers made by FT that acts as an additional cognitive resource, increasing the individuals' cognitive elaboration performance (Proulx and Heine, 2009). Indeed, for individuals, FT emerges as the key resource that consumers can activate when dealing with difficult tasks, such as designing a new product by way of TBSs. Thus, when consumers are empowered by FT, they develop the capabilities needed to cope with the challenges required by the TBSs and, generally speaking, value co-production (Dellaert and Stremersch, 2005; Franke and Schreier, 2010; von Hippel, 2001; Huffman and Kahn, 1998). The relevance of our findings to existing marketing literature lies in the advancement of knowledge related to value co-production processes, by introducing a cognitive process specifically designed for consumer research and marketing. Furthermore, our study explains the mechanism that mediates this effect: FT increases the perceived ease of value-production and, through this, a subsequent increase in the level of consumer enjoyment. At the end of this chain of effects, enjoyment boosts co-production success because it encourages individuals to be more flexible and open, to achieve their goal, to develop innovative ideas and to make more efficient decisions (Eisingerich *et al.*, 2019; Isen, 2000; Isen and Means, 1983). Moreover, the levels of efficiency and satisfaction are also strongly related (Cristol and Sealey, 2000; Norton *et al.*, 2012). Thus, the second key contribution of this work is testing a general framework that connects FT with value co-production: a mechanism capable of making the co-creative process more successful – calculated through a broad range of measures – by making it easier, and more enjoyable.

Third, our research shows how individuals can be effectively stimulated to activate their FT even in ordinary contexts. Although such a result is not the main subject of our research, we show that FT is a cognitive process that can actively be stimulated. Thus, individuals can be regarded as high or low fantasizers not only because they may be more or less predisposed to using their fantasy as an individual personality trait but also because their cognitive process can be activated to a higher or lower extent. Such manipulation is quite popular in analytical psychology and psychoanalysis (Faber *et al.*, 1983; Leuner, 1969). Our study shows that this type of stimulation might be successful even in more ordinary environments where individuals have to complete everyday tasks. Owing to the positive impact of individual fantasy on the performance of value co-production, its activation represents an interesting opportunity for any company dedicated to the design of engaging customer experiences with the aim of reaching higher performance.

6.1 Managerial implications

Our results have a number of implications for managers involved in the digital transformation of companies. This research demonstrates how complexity and consumer stress – the so-called "dark side" of value co-production – can be mitigated by activating FT.

First, companies should consistently use FT as a powerful mechanism to make value co-production easier. In line with the approach to improve ease of use, given the intrinsic complexity of many TBSs, we demonstrate how FT activation affects the ROI of digital consumer-firm interaction. Therefore, when the degree of technological complexity of TBSs is equal to higher levels of FT, this drives higher levels of returns for firms as assessed by attitude and purchase intention regarding co-designed products. Whenever companies choose to invest in TBSs to incorporate consumers into value co-productive processes, they may successfully rely on FT. In digital environments, videos might capture the essential core of FT stimulation resulting in higher performances. Thus, companies should monitor

the extent to which their consumers activate their FT, adopting it in segmenting strategies or as educational programs for their consumers. Indeed, our study clearly highlights the relevance of FT as an additional cognitive resource, which deserves serious attention: with it being of high value, it should be maintained and developed.

Second, companies should pay attention to the positive emotions experienced during the co-production process. Fun and enjoyment are essential ingredients of positive customer experiences and they contribute to lowering the psychological barriers that consumers raise when dealing with complex and uncertain tasks, such as those involved in co-designing products using TBSs. Thus, the adoption of comics, videos, ads and other communication storytelling tools might make individuals enjoy their tasks more. When these are favorably confronted, consumers are more efficient, more creative and more satisfied: just a spoonful of fun makes task performance better.

Third, managers involved in the design of TBSs, as a relevant part of a digital transformation strategy, should pay particular attention to their perceived ease of use. The latter is a key variable with a relevant impact on the success of value co-production. If, on the one hand, TBSs are expected to stimulate consumers to participate in designing customized products, their technological complexity might result in lower levels of performances. Therefore, dealing with acceptance of the technological aspect is a priority for any firm using TBSs, because of its potential effect on outcome variables. Rapidly evolving technologies cannot be adopted superficially. For instance, TBSs should provide individuals with the proper amount of information. Just as a large amount of information does not necessarily equal a high level of knowledge, very sophisticated TBSs do not necessarily drive superior customer experiences of value co-production. Designing pathways aimed at increasing the level of perceived ease, achieved by an accurate selection of content and information provided through the TBSs, represents a key managerial challenge for managers and designers. However, focusing only on technology in global digital transformation strategies could also be dangerous. Companies need to assess and monitor the level of knowledge of their target market - a simple but rarely adopted rule. Since the perceived ease of use is a key driver of value co-production performance, companies should differentiate their customer experiences according to this variable, so that people with higher levels of knowledge can be allowed to cope with more difficult tasks, whilst people with lower levels of knowledge can deal with easier tasks in TBSs. Finding themselves in an era characterized by digital immersion and hyper-connected consumers, firms have developed many skills and key performance indicators aiming at monitoring the difficulties experienced by consumers in specific interaction tasks. As an example, the adoption of a customer effort score is helping managers to optimize investments in consumer interaction by dynamically adapting the interface according to the level of existing consumer knowledge (Dixon *et al.*, 2010). This is a promising environment in which our framework could be successfully introduced to help managers to better measure the ROI of value co-production.

6.2 Limitations and future research

Like all research, this study has some limitations which may also represent interesting avenues for future research. In fact, the empirical analyses focus on specific variables but, at the same time, they neglect other concepts that could be of interest. In this context, an initial discussion should be made regarding the type of value co-production returns. Our studies address several attitudinal and behavioral variables, but further studies could easily extend the range of dependent variables. For instance, social sharing of information has already

emerged as a key process in co-creation (Hajli *et al.*, 2017; Simon and Tossan, 2018; Tajvidi *et al.*, 2018) and could be further investigated.

Furthermore, some boundary conditions might limit our findings. Indeed, while our studies investigate two product categories that are of high potential interest to participants in our samples, they do not check for their high specificity. Tattoos and stickers represent relevant contexts in which consumers can freely express themselves, not only in terms of their related meanings but also for their power to change bodies and personal items. Thus, these product categories could easily be part of the extended self. Because of these specificities, it may be worthwhile to further investigate the attitudes and preferences of individuals toward them as these might affect the external validity of our findings. A potential question might be: are the results of our study also valid for other product categories?

In addition to the previous question, another relevant issue raised by this study refers to FT procedure. In fact, while checking for any confounding effect is mandatory in experimental design, the quality of the data collected should also be considered a priority. In this specific research study, the latter is threatened by the length of the entire procedure used to stimulate FT (approximately 20 min). Even when such a procedure proves to be effective, one could easily argue that it could or should be improved upon in terms of energy required and time. Our goal was to create a laboratory experiment, but would this procedure still be efficient when conducted in the real world or is there a way to simplify it? As consumer research has long recognized that feeling, fun and fantasy are interconnected constructs (Holbrook and Hirschman, 1982), it could be proven that by stimulating fantasy and fun, companies can achieve a synergetic increase in fantasy. This information would be useful because playfulness represents an easy form of stimulation. Indeed, the strong contribution of gamification in stimulating creativity has been recently discovered (Parjanen and Hyypiä, 2019). Finally, another source of concern may be related to the low percentage of females in the sample used for Study 4, as well as the limited size of the entire sample for the same study.

Notes

1. Authors checked the discriminant validity of the FT manipulation procedure used herein in a separate study not reported here. Results are available upon request.
2. Specifically, in the pretest (n = 18), respondents were asked to rate the instructions provided for the ease of technology use measured on a 7-point scale; experts and novices reported different scores, but the difference was not significant. Results are available upon request.
3. The bootstrapping analysis was conducted by employing the PROCESS macro released by Hayes in 2016.
4. Model 6 in Hayes 2013 identifies a model in which there are two mediators; more specifically: X → M1 → M2 → Y.

References

Alvarez-Milán, A., Felix, R., Rauschnabel, P.A. and Hinsch, C. (2018), "Strategic customer engagement marketing: a decision making framework", *Journal of Business Research*, Vol. 92, pp. 61-70.

Aspinwall, L.G. and Taylor, S.E. (1997), "A stitch in time: self-regulation and proactive coping – Swinburne Alma-Primo", *Psychological Bulletin*, Vol. 121 No. 3, pp. 417-436.

Bacon, A.M. and Charlesford, J.J. (2018), "Investigating the association between fantasy proneness and emotional distress: the mediating role of cognitive coping strategies", *Personality and Individual Differences*, Vol. 135, pp. 157-165.

Baden-Fuller, C. and Morgan, M.S. (2010), "Business models as models", *Long Range Planning*, Vol. 43 Nos 2/3, pp. 156-171.

Bagozzi, R.P., Davis, F.D. and Warshaw, P.R. (1992), "Development and test of a theory of technological learning and usage", *Human Relations*, Vol. 45 No. 7, pp. 659-686.

Baron, S., Patterson, A. and Harris, K. (2006), "Beyond technology acceptance: understanding consumer practice", *International Journal of Service Industry Management*, Vol. 17 No. 2, pp. 111-135.

Basoglu, N., Daim, T. and Polat, E. (2014), "Exploring adaptivity in service development: the case of mobile platforms", *Journal of Product Innovation Management*, Vol. 31 No. 3, pp. 501-515.

Bauer, H.H., Falk, T. and Hammerschmidt, M. (2006), "eTransQual: a transaction process-based approach for capturing service quality in online shopping", *Journal of Business Research*, Vol. 59 No. 7, pp. 866-875.

Berthon, P.R., Pitt, L.F., Plangger, K. and Shapiro, D. (2012), "Marketing meets web 2.0, social media, and creative consumers", *Business Horizons*, Vol. 55 No. 3, pp. 261-271.

Bogers, M., Afuah, A. and Bastian, B. (2010), "Users as innovators: a review, critique, and future research directions", *Journal of Management*, Vol. 36 No. 4, available at: https://doi.org/10.1177/0149206309353944

Bolton, D., Dearsley, P., Madronal-Luque, R. and Baron-Cohen, S. (2002), "Magical thinking in childhood and adolescence: development and relation to obsessive compulsion", *British Journal of Developmental Psychology*, Vol. 20 No. 4, pp. 479-494.

Boyer, P. (1997), "Further distinctions between magic, reality, religion, and fiction", *Child Development*, Vol. 68 No. 6, pp. 1012-1014.

Bruner, G.C., II. and Kumar, A. (2005), "Explaining consumer acceptance of handheld internet devices", *Journal of Business Research*, Vol. 58 No. 5, pp. 553-558. Elsevier,

Chan, K.W., Yim, C.K., (Bennett,). and Lam, S.S. (2010), "Is customer participation in value creation a double-edged sword? Evidence from professional financial services across cultures", *Journal of Marketing*, Vol. 74 No. 3, available at: https://doi.org/10.1509/jmkg.74.3.48

Chen, L.-D. and Tan, J. (2004), "Technology adaptation in e-commerce:: key determinants of virtual stores acceptance", *European Management Journal*, Vol. 22 No. 1, pp. 74-86.

Claffey, E. and Brady, M. (2014), "A model of consumer engagement in a virtual customer environment", *Journal of Customer Behaviour*, Vol. 13 No. 4, pp. 325-346.

Cossío-Silva, F.J., Revilla-Camacho, M.Á., Vega-Vázquez, M. and Palacios-Florencio, B. (2016), "Value co-creation and customer loyalty", *Journal of Business Research*, Vol. 69 No. 5, pp. 1621-1625.

Cova, B. and Dalli, D. (2009), "Working consumers: the next step in marketing theory?", *Marketing Theory*, Vol. 9 No. 3, available at: https://doi.org/10.1177/1470593109338144

Cowan, K. and Ketron, S. (2018), "A dual model of product involvement for effective virtual reality: the roles of imagination, co-creation, telepresence, and interactivity", *Journal of Business Research*, Vol. 100.

Cowan, K.L. and Dai, B. (2014), "Who is the 'self' that buys?: An exploratory examination of imaginative consumption and explanation of opinion leadership", *Psychology and Marketing*, available at: https://doi.org/10.1002/mar.20749

Cristol, S.M. and Sealey, P. (2000), *Simplicity Marketing: End Brand Complexity, Clutter, and Confusion*, Free Press, New York, NY.

Dabholkar, P.A. and Bagozzi, R.P. (2002), "An attitudinal model of technology-based self-service: moderating effects of consumer traits and situational factors", *Journal of the Academy of Marketing Science*, Vol. 30 No. 3, pp. 184-201.

Dahl, D.W. and Moreau, P. (2002), "The influence and value of analogical thinking during new product ideation", *Journal of Marketing Research*, Vol. 39 No. 1, pp. 47-60.

Dahl, D.W. and Moreau, C.P. (2007), "Thinking inside the box: why consumers enjoy constrained creative experiences", *Journal of Marketing Research*, Vol. 44 No. 3, available at: https://doi.org/10.1509/jmkr.44.3.357

Davis, F.D. (1989), "Perceived usefulness, perceived ease of use, and user acceptance of information technology", *MIS Quarterly*, Vol. 13 No. 3, pp. 319-340.

Davis, F.D., Bagozzi, R.P. and Warshaw, P.R. (1989), "User acceptance of computer technology: a comparison of two theoretical models", *Management Science*, Vol. 35 No. 8, pp. 982-1003.

DeLanda, M. (2016), *Assemblage Theory*, Edinburgh University Press.

Dellaert, B.G.C. and Stremersch, S. (2005), "Marketing mass-customized products: striking a balance between utility and complexity", *Journal of Marketing Research*, Vol. 42 No. 2, available at: https://doi.org/10.1509/jmkr.42.2.219.62293

Dixon, M., Freeman, K. and Toman, N. (2010), "Stop trying to delight your customers", *Harvard Business Review*, Vol. 88 Nos 7/8, pp. 116-122.

Eisingerich, A.B., Marchand, A., Fritze, M.P. and Dong, L. (2019), "Hook vs hope: how to enhance customer engagement through gamification", *International Journal of Research in Marketing*, Vol. 36 No. 2, available at: https://doi.org/10.1016/j.ijresmar.2019.02.003

Etgar, M. (2008), "A descriptive model of the consumer co-production process", *Journal of the Academy of Marketing Science*, Vol. 36 No. 1, available at: https://doi.org/10.1007/s11747-007-0061-1

Faber, P.A., Saayman, G.S. and Papadopulos, R.K. (1983), "Induced waking fantasy", *Journal of Analytical Psychology*, Vol. 28 No. 2, pp. 141-164.

Finke, R.A. (2014), *Creative Imagery: Discoveries and Inventions in Visualization*, Psychology press.

Folkman, S. (1984), "Personal control and stress and coping processes: a theoretical analysis", *Journal of Personality and Social Psychology*, Vol. 46 No. 4, p. 839.

Folkman, S. and Moskowitz, J.T. (2004), "Coping: Pitfalls and promise", *Annual Review of Psychology*, Vol. 55 No. 1, pp. 745-774.

Folkman, S., Lazarus, R.S., Dunkel-Schetter, C., DeLongis, A. and Gruen, R.J. (1986), "Dynamics of a stressful encounter: cognitive appraisal, coping, and encounter outcomes", *Journal of Personality and Social Psychology*, Vol. 50 No. 5, p. 992.

Franke, N. and Piller, F. (2004), "Value creation by toolkits for user innovation and design: the case of the watch market", *Journal of Product Innovation Management*, Vol. 21 No. 6, pp. 401-415.

Franke, N. and Schreier, M. (2008), "Product uniqueness as a driver of customer utility in mass customization", *Marketing Letters*, Vol. 19 No. 2, pp. 93-107.

Franke, N. and Schreier, M. (2010), "Why customers value self-designed products: the importance of process effort and enjoyment", *Journal of Product Innovation Management*, Vol. 27 No. 7, available at: https://doi.org/10.1111/j.1540-5885.2010.00768.x

Franke, N., Keinz, P. and Steger, C.J. (2009), "Testing the value of customization: when do customers really prefer products tailored to their preferences?", *Journal of Marketing*, Vol. 73 No. 5, available at: https://doi.org/10.1509/jmkg.73.5.103

Franke, N., Schreier, M. and Kaiser, U. (2010), "The 'I designed it myself' effect in mass customization", *Management Science*, Vol. 56 No. 1, available at: https://doi.org/10.1287/mnsc.1090.1077

Fuchs, C. and Schreier, M. (2011), "Customer empowerment in new product development", *Journal of Product Innovation Management*, Vol. 28 No. 1, pp. 17-32.

Gebauer, J., Füller, J. and Pezzei, R. (2013), "The dark and the bright side of co-creation: triggers of member behavior in online innovation communities", *Journal of Business Research*, Vol. 66 No. 9, pp. 1516-1527, available at: https://doi:10.1016/j.jbusres.2012.09.013

Goldenberg, J., Mazursky, D. and Solomon, S. (1999), "Toward identifying the inventive templates of new products: a channeled ideation approach", *Journal of Marketing Research*, Vol. 36 No. 2, available at: https://doi.org/10.2307/3152093

Greenwald, D.F. and Harder, D.W. (1995), "Sustaining fantasies, daydreams, and psychopathology", *Journal of Clinical Psychology*, Vol. 51 No. 6, pp. 719-726.

Greenwald, D.F. and Harder, D.W. (1997), "Fantasies, coping behavior, and psychopathology", *Journal of Clinical Psychology*, Vol. 53 No. 2, pp. 91-97.

Ha, S. and Stoel, L. (2009), "Consumer e-shopping acceptance: antecedents in a technology acceptance model", *Journal of Business Research*, Vol. 62 No. 5, pp. 565-571.

Hajli, N., Shanmugam, M., Papagiannidis, S., Zahay, D. and Richard, M.O. (2017), "Branding co-creation with members of online brand communities", *Journal of Business Research*, Vol. 70, pp. 136-144.

Harris, P.L. (1994), "Unexpected, impossible and magical events: children's reactions to causal violations", *British Journal of Developmental Psychology*, Vol. 12 No. 1, pp. 1-7.

Harris, P.L. (1997), "The last of the magicians? Children, scientists, and the invocation of hidden causal powers", *Child Development*, Vol. 68 No. 6, available at: https://doi.org/10.1111/j.1467-8624.1997.tb01978.x

Heidenreich, S., Wittkowski, K., Handrich, M. and Falk, T. (2015), "The dark side of customer co-creation: exploring the consequences of failed co-created services", *Journal of the Academy of Marketing Science*, Vol. 43 No. 3, available at: https://doi.org/10.1007/s11747-014-0387-4

Hertzig, M.E. and Farber, E.A. (1999), *Annual Progress in Child Psychiatry and Child Development 1998*, Brunner/Mazel, Philadelphia.

Holbrook, M.B. and Hirschman, E.C. (1982), "The experiential aspects of consumption: consumer fantasies, feelings, and fun", *Journal of Consumer Research*, Vol. 9 No. 2, pp. 132-140.

Hoyer, W.D., Chandy, R., Dorotic, M., Krafft, M. and Singh, S.S. (2010), "Consumer cocreation in new product development", *Journal of Service Research*, Vol. 13 No. 3, pp. 283-296.

Hsieh, J.K. and Hsieh, Y.C. (2015), "Dialogic co-creation and service innovation performance in high-tech companies", *Journal of Business Research*, Vol. 68 No. 11, pp. 2266-2271.

Huffman, C. and Kahn, B.E. (1998), "Variety for sale: mass customization or mass confusion?", *Journal of Retailing*, Vol. 74 No. 4, available at: https://doi.org/10.1016/S0022-4359(99)80105-5

Ind, N. and Coates, N. (2013), "The meanings of co-creation", *European Business Review*, Vol. 25 No. 1, available at: https://doi.org/10.1108/09555341311287754

Insko, C.A. (1967), *Theories of Attitude Change*, Appleton-Century-Crofts, New York, NY.

Insko, C.A., Worchel, S., Songer, E. and Arnold, S.E. (1973), "Effort, objective self-awareness, choice, and dissonance", *Journal of Personality and Social Psychology*, Vol. 28 No. 2, p. 262.

Isen, A.M. (1999), "Positive affect", *Handbook of Cognition and Emotion, 25 February*, available at: https://doi.org/doi:10.1002/0470013494.ch25

Isen, A.M. (2000), "Some perspectives on positive affect and self-regulation", *Psychological Inquiry*, Vol. 11 No. 3, pp. 184-187.

Isen, A.M. and Means, B. (1983), "The influence of positive affect on decision-making strategy", *Social Cognition*, Vol. 2 No. 1, pp. 18-31.

Johnson, C.N. (1997), "Crazy children, fantastical theories, and the many uses of metaphysics", *Child Development*, Vol. 68 No. 6, pp. 1024-1026.

Jones, D.F. (1975), "A survey technique to measure demand under various pricing strategies", *Journal of Marketing*, Vol. 39 No. 3, pp. 75-77.

Keinan, G. (1994), "Effects of stress and tolerance of ambiguity on magical thinking", *Journal of Personality and Social Psychology*, Vol. 67 No. 1, pp. 48-55.

Kim, J. and Forsythe, S. (2008a), "Sensory enabling technology acceptance model (SE-TAM): a multiple-group structural model comparison", *Psychology and Marketing*, Vol. 25 No. 9, pp. 901-922.

Kim, J. and Forsythe, S. (2008b), "Adoption of virtual try-on technology for online apparel shopping", *Journal of Interactive Marketing*, Vol. 22 No. 2, pp. 45-59.

Kim, J. and Lee, K.H. (2019), "Influence of integration on interactivity in social media luxury Brand communities", *Journal of Business Research*, Vol. 99, pp. 422-429.

Kjeldgaard, D. and Bengtsson, A. (2005), "Consuming the fashion tattoo", *Advances in Consumer Research*, Vol. 32, pp. 172-177.

Klinger, E. (1977), "The nature of fantasy and its clinical uses", *Psychotherapy*, Vol. 14 No. 3, pp. 223-231.

Kramer, T. and Block, L. (2011), "Nonconscious effects of peculiar beliefs on consumer psychology and choice", *Journal of Consumer Psychology*, Vol. 21 No. 1, pp. 101-111.

Lam, A. (2018), "Who has the most tattoos?", *Market Insight, Dalia Research*.

Langer, E.J. (1975), "The illusion of control", *Journal of Personality and Social Psychology*, Vol. 32 No. 2, available at: https://doi.org/10.1037/0022-3514.32.2.311

Laukkanen, T. (2016), "Consumer adoption versus rejection decisions in seemingly similar service innovations: the case of the internet and mobile banking", *Journal of Business Research*, Vol. 69 No. 7, available at: https://doi.org/10.1016/j.jbusres.2016.01.013

Lazarus, R.S., Kanner, A.D. and Folkman, S. (1980), "Emotions: a cognitive–phenomenological analysis", *Theories of Emotion*, Elsevier, pp. 189-217.

Lee, M.K.O., Cheung, C.M.K. and Chen, Z. (2005), "Acceptance of internet-based learning medium: the role of extrinsic and intrinsic motivation", *Information and Management*, Vol. 42 No. 8, pp. 1095-1104.

Lee, Y., Kozar, K.A. and Larsen, K.R.T. (2003), "The technology acceptance model: past, present, and future", *Communications of the Association for Information Systems*, Vol. 12 No. 1, p. 50.

Leuner, H. (1969), "Guided affective imagery (GAI)", *American Journal of Psychotherapy*, Vol. 23 No. 1, pp. 4-22.

Lu, Y., Papagiannidis, S. and Alamanos, E. (2019), "Exploring the emotional antecedents and outcomes of technology acceptance", *Computers in Human Behavior*, Elsevier, August 2018, Vol. 90, pp. 153-169.

Lunardo, R., Roux, D. and Chaney, D. (2016), "The evoking power of servicescapes: consumers' inferences of manipulative intent following service environment-driven evocations", *Journal of Business Research*, Vol. 69 No. 12, pp. 6097-6105.

Lynn, S.J. and Rhue, J.W. (1986), "The fantasy-prone person. Hypnosis, imagination, and creativity", *Journal of Personality and Social Psychology*, Vol. 51 No. 2, pp. 404-408.

Lynn, S.J. and Rhue, J.W. (1988), "Fantasy proneness", *American Psychologist*, Vol. 43 No. 1, pp. 35-44.

MacInnis, D.J. and Price, L.L. (1987), "The role of imagery in information processing: review and extensions", *Journal of Consumer Research*, Vol. 13 No. 4, p. 473.

Manis, K.T. and Choi, D. (2018), "The virtual reality hardware acceptance model (VR-HAM): extending and individuating the technology acceptance model (TAM) for virtual reality hardware", *Journal of Business Research*, Vol. 100.

Matthews, G. and Wells, A. (1999), "The cognitive science of attention and emotion", in Dalgleish, T. and Power, M.J. (Eds), *Handbook of Cognition and Emotion*, John Wiley & Sons Ltd., New York, NY, pp. 171-192.

Merckelbach, H., Muris, P. and Rassin, E. (1999), "Fantasy proneness and cognitive failures as correlates of dissociative experiences", *Personality and Individual Differences*, Vol. 26 No. 5, pp. 961-967.

Mitchell, V.W. and Papavassiliou, V. (1999), "Marketing causes and implications of consumer confusion", *Journal of Product and Brand Management*, Vol. 8 No. 4, available at: https://doi.org/10.1108/10610429910284300

Mitchell, J.P., Banaji, M.R. and Macrae, C.N. (2005), "The link between social cognition and self-referential thought in the medial prefrontal cortex", *Journal of Cognitive Neuroscience*, Vol. 17 No. 8, available at: https://doi.org/10.1162/0898929055002418

Moreau, C.P. and Dahl, D.W. (2005), "Designing the solution: the impact of constraints on consumers' creativity", *Journal of Consumer Research*, Vol. 32 No. 1, available at: https://doi.org/10.1086/429597

Moreau, C.P., Bonney, L. and Herd, K.B. (2011), "It's the thought (and the effort) that counts: how customizing for others differs from customizing for oneself", *Journal of Marketing*, Vol. 75 No. 5, pp. 120-133.

Muris, P., Meesters, C. and van den Berg, F. (2003), "The strengths and difficulties questionnaire (SDQ)", *European Child and Adolescent Psychiatry*, Vol. 12 No. 1, pp. 1-8.

Norton, M.I., Mochon, D. and Ariely, D. (2012), "The IKEA effect: when labor leads to love", *Journal of Consumer Psychology*, Vol. 22 No. 3, available at: https://doi.org/10.1016/j.jcps.2011.08.002

Oh, S.H., Kim, Y.M., Lee, C.W., Shim, G.Y., Park, M.S. and Jung, H.S. (2009), "Consumer adoption of virtual stores in Korea: focusing on the role of trust and playfulness", *Psychology and Marketing*, Vol. 26 No. 7, pp. 652-668.

Ostrom, A.L., Parasuraman, A., Bowen, D.E., Patrício, L. and Voss, C.A. (2015), "Service research priorities in a rapidly changing context", *Journal of Service Research*, Vol. 18 No. 2, pp. 127-159.

Ouschan, R., Sweeney, J. and Johnson, L. (2006), "Customer empowerment and relationship outcomes in healthcare consultations", *European Journal of Marketing*, Vol. 40 Nos 9/10, pp. 1068-1086.

Parjanen, S. and Hyypiä, M. (2019), "Innotin game supporting collective creativity in innovation activities", *Journal of Business Research*, Vol. 96, pp. 26-34.

Pires, G.D., Dean, A. and Rehman, M. (2015), "Using service logic to redefine exchange in terms of customer and supplier participation", *Journal of Business Research*, Vol. 68 No. 5, pp. 925-932.

Plucker, J.A. and Renzulli, J.S. (1999), "Psychometric approaches to the study of human creativity", *Handbook of Creativity*, Cambridge University Press, New York, NY, pp. 35-61.

Porter, C.E. and Donthu, N. (2006), "Using the technology acceptance model to explain how attitudes determine internet usage: the role of perceived access barriers and demographics", *Journal of Business Research*, Vol. 59 No. 9, pp. 999-1007.

Prahalad, C.K. and Ramaswamy, V. (2004), "Co-creation experiences: the next practice in value creation", *Journal of Interactive Marketing*, Vol. 18 No. 3, available at: https://doi.org/10.1002/dir.20015

Proulx, T. and Heine, S.J. (2009), "Connections from Kafka", *Psychological Science*, Vol. 20 No. 9, available at: https://doi.org/10.1111/j.1467-9280.2009.02414.x

Ramaswamy, V. and Ozcan, K. (2018), "What is co-creation? An interactional creation framework and its implications for value creation", *Journal of Business Research*, Vol. 84, pp. 196-205.

Ranjan, K.R. and Read, S. (2016), "Value co-creation: concept and measurement", *Journal of the Academy of Marketing Science*, Vol. 44 No. 3, pp. 290-315.

Rogers, E.M. (1962), *Diffusion of Innovations*, Free Press of Glencoe, New York, NY.

Sawhney, M., Verona, G. and Prandelli, E. (2005), "Collaborating to create: the internet as a platform for customer engagement in product innovation", *Journal of Interactive Marketing*, Vol. 19 No. 4, pp. 4-17.

Schlosser, A.E. and Shavitt, S. (2002), "Anticipating discussion about a product: rehearsing what to say can affect your judgments", *Journal of Consumer Research*, Vol. 29 No. 1, available at: https://doi.org/10.1086/339924

Schreier, M. (2006), "The value increment of mass-customized products: an empirical assessment", *Journal of Consumer Behaviour*, Vol. 5 No. 4, pp. 317-327.

Shadish, W.R., Cook, T.D. and Campbell, D.T. (2002), *Experimental and Quasi-Experimental Designs for Generalized Causal Inference*, Houghton Mifflin, Boston.

Sheng, X. and Zolfagharian, M. (2014), "Consumer participation in online product recommendation services: augmenting the technology acceptance model", *Journal of Services Marketing*, Vol. 28 No. 6, pp. 460-470.

Simon, H.A. (1967), "Motivational and emotional controls of cognition", *Psychological Review*, Vol. 74 No. 1, p. 29.

Simon, F. and Tossan, V. (2018), "Does brand-consumer social sharing matter? A relational framework of customer engagement to brand-hosted social media", *Journal of Business Research*, Vol. 85, pp. 175-184.

Simonson, I. (2005), "Determinants of customers responses to customized offers", *Journal of Marketing*, Vol. 69 No. 1.

Singer, J.L. (1961), "Imagination and waiting ability in young children", *Journal of Personality*, Vol. 29 No. 4, pp. 396-413.

Singer, J.L. (1966), *Daydreaming: An Introduction to the Experimental Study of Inner Experience., Daydreaming: An Introduction to the Experimental Study of Inner Experience*, Crown Publishing Group/Random House, New York, NY.

Singer, J.L., Biblow, E. and Freyberg, J.T. (1973), *The Child's World of Make-Believe: Experimental Studies of Imaginative Play, the Child's World of Make-Believe: Experimental Studies of Imaginative Play*, Academic Press, Oxford.

Tajvidi, M., Richard, M.O., Wang, Y.C. and Hajli, N. (2018), "Brand co-creation through social commerce information sharing: the role of social media", *Journal of Business Research*, No. June, pp. 1-11.

Taylor, M. and Carlson, S.M. (1997), "The relation between individual differences in fantasy and theory of mind", *Child Development*, Vol. 68 No. 3, pp. 436-455.

Totten, J., Lipscomb, T.J. and Jones, M.A. (2009), "Attitudes toward and stereotypes of persons with body art: implications for marketing management", *Academy of Marketing Studies Journal*, Vol. 13, pp. 77-96.

Valenzuela, A., Dhar, R. and Zettelmeyer, F. (2009), "Contingent response to self-customization procedures: implications for decision satisfaction and choice", *Journal of Marketing Research*, Vol. 46 No. 6, available at: https://doi.org/10.1509/jmkr.46.6.754

Vallaster, C. and von Wallpach, S. (2013), "An online discursive inquiry into the social dynamics of multi-stakeholder brand meaning co-creation", *Journal of Business Research*, Vol. 66 No. 9, pp. 1505-1515, available at: https://doi:10.1016/j.jbusres.2012.09.012

van Dolen, W.M. and de Ruyter, K. (2002), "Moderated group chat: an empirical assessment of a new e-service encounter", *International Journal of Service Industry Management*, Vol. 13 No. 5, pp. 496-511.

van Doorn, J., Lemon, K.N., Mittal, V., Nass, S., Pick, D., Pirner, P. and Verhoef, P.C. (2010), "Customer engagement behavior: theoretical foundations and research directions", *Journal of Service Research*, Vol. 13 No. 3, pp. 253-266.

von Hippel, E. (1986), "Lead users: a source of novel product concepts", *Management Science*, Vol. 32 No. 7, pp. 791-805.

von Hippel, E. (2001), "User toolkits for innovation", *Journal of Product Innovation Management*, Vol. 18 No. 4, pp. 247-257.

Venkatesh, V. (2000), "Determinants of perceived ease of use: integrating control, intrinsic motivation, and emotion into the technology acceptance model", *Information Systems Research*, Vol. 11 No. 4, pp. 342-365.

Venkatesh, V. and Davis, F.D. (2000), "A theoretical extension of the technology acceptance model: four longitudinal field studies", *Management Science*, Vol. 46 No. 2, p. 186.

Weibel, D., Martarelli, C.S., Häberli, D. and Mast, F.W. (2018), "The fantasy questionnaire: a measure to assess creative and imaginative fantasy", *Journal of Personality Assessment*, Vol. 100 No. 4, pp. 431-443.

Weijters, B., Rangarajan, D., Falk, T. and Schillewaert, N. (2007), "Determinants and outcomes of customers' use of self-service technology in a retail setting", *Journal of Service Research*, Vol. 10 No. 1, pp. 3-21.

Wertenbroch, K. and Skiera, B. (2002), "Measuring consumer willingness to pay at the point of purchase", *Journal of Marketing Research*, Vol. 39 No. 2, pp. 228-241.

Wilson, S.C. and Barber, T.X. (1982), "The fantasy-prone personality: implications for understanding imagery, hypnosis, and parapsychological phenomena", *Psi Research*, Washington, DC Research Center and the Foundation for Human Science.

Wooldridge, M. (2009), *An Introduction to Multiagent Systems*, John Wiley and Sons.

Woolley, J.D. (1997), "Thinking about fantasy: are children fundamentally different thinkers and believers from adults?", *Child Development*, Vol. 68 No. 6, pp. 991-1011.

Zaborek, P. and Mazur, J. (2019), "Enabling value co-creation with consumers as a driver of business performance: a dual perspective of polish manufacturing and service SMEs", *Journal of Business Research*, Vol. 104, available at: https://doi:10.1016/j.jbusres.2018.12.067

Zhao, X., Lynch, J.G. and Chen, Q. (2010), "Reconsidering Baron and Kenny: myths and truths about mediation analysis", *Journal of Consumer Research*, Vol. 37 No. 2, available at: https://doi.org/10.1086/651257

Zsila, Á., Orosz, G., Bőthe, B., Tóth-Király, I., Király, O., Griffiths, M. and Demetrovics, Z. (2018), "An empirical study on the motivations underlying augmented reality games: the case of Pokémon go during and after Pokémon fever", *Personality and Individual Differences*, Vol. 133, pp. 56-66.

Further reading

Anker, T.B., Sparks, L., Moutinho, L. and Grönroos, C. (2015), "Consumer dominant value creation", *European Journal of Marketing*, Vol. 49 Nos 3/4, pp. 532-560.

Broodie, R.J., Hollebeek, L.D., Juric, B. and Ilic, A. (2011), "Customer engagement: conceptual domain, fundamental propositions, and implications for research", *Journal of Service Research*, Vol. 17 No. 3, pp. 1-20.

Chen, J.S., Tsou, H.T. and Ching, R.K.H. (2011), "Co-production and its effects on service innovation", *Industrial Marketing Management*, Vol. 40 No. 8, available at: https://doi.org/10.1016/j.indmarman.2011.03.001

Edvardsson, B., Tronvoll, B. and Gruber, T. (2011), "Expanding understanding of service exchange and value co-creation: a social construction approach", *Journal of the Academy of Marketing Science*, Vol. 39 No. 2, available at: https://doi.org/10.1007/s11747-010-0200-y

Frow, P. and Payne, A. (2011), "A stakeholder perspective of the value proposition concept", *European Journal of Marketing*, Vol. 45 Nos 1/2, pp. 223-240.

Harmeling, C.M., Moffett, J.W., Arnold, M.J. and Carlson, B.D. (2017), "Toward a theory of customer engagement marketing", *Journal of the Academy of Marketing Science*, Vol. 45 No. 3, pp. 312-335.

Hunt, D.M., Geiger-Oneto, S. and Varca, P.E. (2012), "Satisfaction in the context of customer co-production: a behavioral involvement perspective", *Journal of Consumer Behaviour*, Vol. 11 No. 5, available at: https://doi.org/10.1002/cb.1370

Kumar, V. (2013), *Profitable Customer Engagement: Concept, Metrics and Strategies*, SAGE Publications India.

Kumar, V., Aksoy, L., Donkers, B., Venkatesan, R., Wiesel, T. and Tillmanns, S. (2010), "Undervalued or overvalued customers: capturing total customer engagement value", *Journal of Service Research*, Vol. 13 No. 3, pp. 297-310.

Lemon, K.N. and Verhoef, P.C. (2016), "Understanding customer experience throughout the customer journey", *Journal of Marketing*, Vol. 80 No. 6, pp. 69-96.

Ordanini, A., Miceli, L., Pizzetti, M. and Parasuraman, A. (2011), "Crowd-funding: transforming customers into investors through innovative service platforms", *Journal of Service Management*, Vol. 22 No. 4, available at: https://doi.org/10.1108/09564231111155079

Pansari, A. and Kumar, V. (2017), "Customer engagement: the construct, antecedents, and consequences", *Journal of the Academy of Marketing Science*, Vol. 45 No. 3, pp. 294-311.

Payne, A.F., Storbacka, K. and Frow, P. (2008), "Managing the co-creation of value", *Journal of the Academy of Marketing Science*, Vol. 36 No. 1, available at: https://doi.org/10.1007/s11747-007-0070-0

Payne, E.M., Peltier, J. and Barger, V.A. (2017), "Omni-channel marketing, integrated marketing communications and consumer engagement: a research agenda", *Journal of Research in Interactive Marketing*, available at: https://doi.org/10.1016/B978-0-12-375678-7.01110-X

Porter, C.E., Donthu, N., MacElroy, W.H. and Wydra, D. (2011), "How to foster and sustain engagement in virtual communities", *California Management Review*, Vol. 53 No. 4, pp. 80-110.

Roy, S.K., Balaji, M.S., Soutar, G., Lassar, W.M. and Roy, R. (2018), "Customer engagement behavior in individualistic and collectivistic markets", *Journal of Business Research*, Vol. 86, pp. 281-290.

Schreier, M., Fuchs, C. and Dahl, D.W. (2012), "The innovation effect of user design: innovation perceptions of firms selling products designed by users", *Journal of Marketing*, Vol. 76 No. 5, pp. 18-32.

Sugathan, P., Ranjan, K.R. and Mulky, A.G. (2017), "An examination of the emotions that follow a failure of co-creation", *Journal of Business Research*, Vol. 78, pp. 43-52.

Corresponding author
Michela Addis can be contacted at: michela.addis@uniroma3.it