"Should Organizations Leverage 360-degree Commercial Video Campaigns?"

The influence on customer-brand engagement and customer-based brand equity

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Supervisors:	Dr. C.V. Gelhard Dr. K. Zalewska-Kurek Prof. Dr. Jörg Henseler
Student Name:	Yitan Shi
Student Number:	s1690345
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UNIVERSITEIT TWENTE.

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Abstract

The purpose of this study is to investigate the effectiveness of leveraging 360-degree commercial campaigns. As one of the first studies to exam its potential values, the research identifies five constructs, namely perceived innovativeness, perceived enjoyment and engagement behavior as represents of the customer-brand engagement; brand awareness and customer equity as the customer-based brand equity. The hypotheses model is developed, intending to shed light on that those factors are expected to impact more on 360-degree commercials than traditional commercials. The research design utilizes Mercedes-Benzes' Loki Campaigns as the experimental subjects and empirically compares the different effectiveness on two types of commercial video based on the Multivariate Analysis Variance-Covariance technique. The findings indicate types of video effect insignificant on perceived enjoyment and brand awareness; the 360-degree commercial is associated with lower engagement behavior and customer equity when compared to the traditional commercial; and act contradictorily on perceived innovativeness and customer equity when controlling gender groups. Based on the findings, the theoretical implications for the future research and the practical implications are discussed thoroughly.

Keywords: 360-degree commercial campaigns, perceived innovativeness, perceived enjoyment, engagement behavior, brand awareness, customer equity, customer-brand engagement, customer-based brand equity

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1. Introduction

It is no secret that the proliferation of innovative marketing campaigns creates unparalleled competitive forces for multinational enterprises to reach and engage customers. Yet the difficulties to embark marketing campaigns on a wide array are still stymied by marketers in delivering on the aspirations. According to a report (ANA, 2014), 94% marketers agreed that investing in new technologies was the top strategy for responding marketing disruption but only 13% created the measurable impact. Virtual Reality (VR) is an agreeable alternative to respond to the marketing disruption, which has been poised to be the cutting-edge innovative technology to leverage for future marketing. Many multinationals are already battling with their VR campaigns, desiring to upgrade consumer experiences and enhance competitiveness. But the questions are altered in terms of the impact of leveraging VR-related campaigns; such subjects should be barely ignored.

1.1 VR-related Marketing Campaigns

VR is functionalized under a one hundred percent graphical immersive environments (Fox, Arena & Bailenson, 2009). It can require hardware setups to stimulate one or more human senses, allowing users to participate and move in the virtual environment that similar to the real world (Fox et al, 2009). The virtual environment can be built as simple as a cellular phone or as complicated as fully immersed VR setups (Fox et al, 2009). Simple wearable headsets such as Google Cardboard and Samsung Gear VR can prototype virtual environment. By inserting a smartphone in the headset, users can immerse and interact with virtual contents. Complex setups can incorporate in a virtual environment that created by the different multi-sensory interfaces such as haptic devices and auditory sensory to match visual depictions (Chu, Dani & Gadh, 1997; Fox et al, 2009).

Based on the different VR setups, two VR marketing campaigns can be identified: VR In-Store Campaigns and 360-degree Video Campaigns. VR in-store campaigns require complex settings that enable users to explore in an artificial environment with virtual objects in a completely immersed environment (Choi, Lim & Jeong, 2016). For instance, Merrell introduced their new hiking boot by leveraging a VR in-store campaign called *Trailscape* that took consumers on a dangerous mountain hike experience. Participants were asked to wear motion-tracking headsets to explore the mountainside, coinciding with the tactile elements such as a shaking wooden bridge, making this campaign one of the best immersive VR experiences to date. The 360-degree video is one type of VR video. Rather than limiting a single viewpoint, this video solution can freely adapt users viewing angle inside the omni-directionally captured video scenes (Wijnants, Erum, Quax & Lamotte, 2016). This technology holds important promises by affording the ability to spatially navigate through the video scene in real-time (Wijnants et al, 2016), which enhances feelings of immersion and interaction that a traditional video cannot do.

Leveraging 360-degree video campaigns might solidify a granting view for marketers, thanks to the recent appearances of inexpensive VR headsets. Mainstream smartphone systems – Android and iOS – also yield users to take panoramic photos and video. YouTube and Facebook enlarged their market spending in 2015 by offering 360-degree video upload

and visualization (Bibiloni, Ramis, Oliver & Perales, 2016); and viewing such video are made available through their mobile applications. These social media giants accept users to explore 360-degree creatures by wearing simple head-mounted displayers (HMD), dragging video, or moving motion devices such as an iPhone; thereby creating a new viewing pattern. Taken these circumstances, perhaps, no other recent technologies have captured more attention from marketers than launching 360-degree video campaigns as a sophisticated yet inexpensive alternative compared with VR in-store campaigns.

Various multinationals have established the presences of 360-degree video campaigns: Coca-Cola, Disney, McDonald and Audi, to name a few. This study recognizes two major marketing streams that adopt 360-degree campaigns: one stream dedicates to entertaining experiences; such as a roller coaster ride (e.g. Coca-Cola and Disney) or a cockpit view experiences (e.g. Swiss Air and Breitling). Another one hatches product introduction in advertising that can be viewed as part of the marketing innovation. The distinction between two types of campaigns, arguably, is the experiential values. The former campaigns employ from computer gaming and focus on the "experience the experiences". Hence, the motion tracking is particularly critical for users to explore in the virtual scenery and require a highly immersive environment. The latter focuses less on experiences, since dragging video or moving the motion devices can neutralize users' immersive experiences. In that sense, the 360-degree commercial could bear a comparison with the traditional commercial, besides being flattered into its very different viewing pattern, sensory richness and polished features by practitioners. It is therefore doubted whether 360-degree commercial campaigns have a more serious purpose to be leveraged beyond entertainment or "being innovative/agile". With a preliminary difference between two types of commercial video, this study dedicates to investigate the potential values of 360-degree commercial campaigns.

1.2 Research Gaps

Current 360-degree commercial campaigns have two major exposing channels that can reach audiences: companies' own websites and social media. Social media, particularly YouTube and Facebook, promote a more cost-effective and humanizing effect to voice out brand messages in comparison with other forms of online advertising strategies (e.g e-mail advertising, search advertising and banner ads) (Kim, Son & Han, 2016). As such, they become the most essential and effective channels to boost ads exposures, enabling to reach mass audiences. The unique features of 360-degree commercial video might afford to capitalize business values and can be perceived as an innovative marketing output to deliver brand messages through social media. Nonetheless, 360-degree commercials are restricted from YouTube's "skippable ads" and Facebook's "suggesting features" mechanisms; leaving fewer chances to be exposed forthwith compare with traditional online commercials. Sensing that such commercial campaigns have many restrictions in an online advertising context, several questions are alerted: Does 360-degree commercial video worth to invest? Can 360-degree commercial campaigns maximize positive consumers engagement behaviors? What values will companies generate from 360-degree commercial campaigns?

Correspondingly, empirical evidence and literature debates have been missing in two perspectives. First, incumbents master most attentions on explaining the benefits of

leveraging 360-degree video. However, authors often neglect that simply leveraging 360-degree video can be ill-used to derive business value. Adopting 360-degree video only enables possible brands' action on building customer-brand engagement without guaranteeing consumers' positive perceptions and engagement behaviors. Uncertainties exist as to what values do consumers perceived from the 360-degree commercial video; what engagement behaviors do customers act, and in what way does this type of commercial enhance values of a brand to its customers. The deficiencies in scientific research have not been empirically granted. Second, divergent findings claim that online commercials facilitate consumer participation and brand management. It is critical since commercials increase brand equity, maximizes market explosion (Kim et al, 2016), drives sales growth (Cambra-Fierro, Melero-Polo, & Vázquez-Carrasco, 2013) and enhances marketing performance (Brodie, Ilic, Juric & Hollebeek, 2011; 2013). Despite apparent corporate consensus, the research that verifies the effectiveness of 360-degree advertising receives limited attentions. Both perspectives may, however, due to the fact that topics of 360-degree commercial campaigns are still remaining exploratory.

1.3 Research Questions and Sub-questions

To address these gaps, this study evaluates whether 360-degree commercial generates values. Essentially, an experiment regarding the comparison between 360-degree commercial video solution (360DCVS) and traditional commercial video solution (TCVS) should be employed to verify the effectiveness of 360-degree commercials.

In accordance with the first research gap, customer-brand engagement is purposed. Considering that engagement is a multidimensional theory that is comprised by cognition, emotion and action of individuals, this paper deploys perceived innovativeness, perceived enjoyment and engagement behavior to represent each dimension purposely.

RQ1: To what extent could 360-degree commercial video generate customer-brand engagement?

SQ1: To what extent do types of commercial video effect on perceived innovativeness?

SQ2: To what extent do types of commercial video effect on perceived enjoyment?

SQ3: To what extent do types of commercial video effect on engagement behavior?

Ads effectiveness is often evaluated by customer-based brand equity dimensions, which have been empirically validated by many research (e.g. Yoo, Donthu & Lee, 2000); Townsend, Cavusgil & Calantone, 2012). What is unclear, though, is the underpinning phenomenon that occurs in whether 360DCVS can boost one's perceptions of a brand itself, ultimately, triggers sales. Hence, this paper purposes the second research question: **To what extent could 360-degree commercial video generate customer-based brand equity?**

1.4 Research Objectives

The research objective of this paper is to investigate whether the 360DCVS can generate more values than the TCVS in order to provide meaningful implications. As one of the very first research, it is expected to have a great many to provide for: the start points for future research on relative topics; the insightful implications to multinationals in engaging customers through innovative advertising methods; and the measures of 360-dergee commercials effectiveness.

The literature reviews deplore the necessity for investigating customer-brand engagement (CBE) and customer-based brand equity (CBBE). Both concepts acquire prior literature and research models from the traditional commercial video contexts. The research hypotheses chapter develops the hypotheses model for the present study, aiming at explaining the relationship between types of video solutions and aforementioned constructs, as well as shedding light on that those factors are having more impactful values on 360-degree commercial campaigns. Followed, the research design chapter discusses case selections and data collection method to explain how to exam the hypotheses models. Data analyses chapter reveals the hypotheses testing decisions based on the statistical data from questionnaires, allowing discussion chapter presenting the major findings. Based on the results, I discuss the limitation of the paper and purpose possible future research for examining the effectiveness of 360-degree commercial campaigns. The conclusion is given in the end to grant readers comprehensive views of the major findings and possible implications for this paper.

2. Literature Reviews

2.1 Customer-Brand Engagement

The theoretical roots of engagement concept in the marketing domain lie in a two-way interaction between engagement subjects (e.g. consumer) and a specific engagement object (e.g. brands). Central to discussions about engagement is to describe the dimensionality of engagement. Multidimensional is the most holistic view to explain engagement, indicating cognition (thoughts), emotion (feeling), and behavior (action) respectfully. Hollebeek (2011) explained CBE was the process during a brand related interaction: it is "the level of a customer's motivational, brand-related, and context-dependent state of mind characterized by specific levels of cognitive, emotional and behavioral activity in brand interactions" (p.790). Unidimensional perspective majorly assesses engagement behaviors; cognition and emotion declares as the supplementary but requires (Kuvykaitė & Tarutė, 2015). This perspective stresses that "to engage" in a customer-to-firm relationship implies a *behavioral focus* and it shall conceptually distinct from psychological constructs (van Doorn et al, 2010). Behaviors are the outcomes of individual's psychological process; such behaviors reveal consumers' experiences and activities toward a brand (van Doorn et al, 2010).

Mollen and Wilson (2010) established the Stimulus-Organism-Response (S-O-R) model to verify the role of engagement in the virtual context. Specifically, they considered engagement objects such as a virtual store or other computer-mediated entities as the *stimulus*; *organism* phase was consumers' internal state of overall interactive experiences that generated engagement. Based on the generate experiences, consumer' attitudes and behaviors conducive to purchase reflected whether their engagement process was positive or negative; hence, *response*. Engagement in the virtual context was, therefore, the "cognitive and affective commitment to an active relationship with the brand as personified by the website or other computer-mediated entities designed to communicate brand value" (Mollen & Wilson, 2010, p. 919). They further noted that engagement incorporates individual's perceived experiential value (emotional congruence with the narrative schema encountered in computer-mediated entities) together with the instrumental value (mental cognitive utility and relevance) obtained from specific brand interaction (Mollen & Wilson, 2010). In this recognition, engagement is a process that shall be extended beyond mere involvement, since engagement reveals an interactive relationship with the stimulated engagement objects and reflects consumers' psychological process. The engagement process is thereafter dominant consumers' attitudes and behavioral changes toward stimulus objects.

Despite ongoing debates of dimension inclusions regarding whether behavioral activities should be measured during the engagement processes (e.g. Brodie et al, 2011; Hollebeek, 2011), or treated as engagement responses/consequences (e.g. Mollen & Wilson, 2010; Calder & Malthouse, 2008; 2009; 2015); the mutual agreement is the foundation of engagement comes from interactivities experiences (e.g. Mollen & Wilson, 2010; Brodie et al, 2011; Calder & Malthouse, 2015). Brodie et al (2011) decomposed experiences by "involvement" and "participation"; and defined engagement as a "psychological state that occurs by virtue of interactive, cocreative customer experiences with a focal agent/object (e.g. a brand) in focal service relationship" (p. 260). Calder and Malthouse (2015) rooted advertisement engagement

in media vehicles and revealed that engagement *per se* is comprised of "the sum of motivational experiences consumers have with the media product" (p. 5). Consumers' behaviors such as affective response, usage and attentiveness, as well as reactions to an ad were treated as consequences, as they were driven by the perceived interactive experiences (Calder & Malthouse, 2008; 2015).

It is understandable the primary reason to exclude behavior during the engagement process is because of "motivation drives action". Without stimuli, however, it can hardly generate motivations. Given the unique feature of 360-degree video, this stimulus surely inquires an interactive activity during the engagement process, which affects on users cognition, emotion and action at the same time. Hence, this paper urges no need to outweigh neither psychological view nor behavioral view. Meanwhile, concurrent objectives to leverage 360-degree commercials, from the companies' viewpoint, centralize in presenting organization's capabilities to deliver innovative ads and stimulating more consumers' sensations to achieve a playful engagement. Rarely in case do companies measure whether the 360-degree commercials do help to enhance consumers perceived innovativeness and perceived enjoyment values, as they expect. This research takes consumers' viewpoints, purposing perceived innovativeness and perceived enjoyment to exam their internal state of interactive experiences that are in line with the brands' objectives and unique features of 360-degree video. Therefore, this paper utilizes the multidimensional view, by means perceived innovativeness, perceived enjoyment and positive engagement behavior as the same order constructs, to exam the impact on customer-brand engagement.

2.2 Customer-based Brand Equity

Customer-based Brand Equity (CBBE) is a core subject in measuring marketing performance. To define CBBE, two approaches are complemented (Leone, Rao, Keller, Luo, McAlister & Srivastava, 2006). An "indirect" approach would identify and track brand knowledge structures of consumers (Leone et al, 2006). Keller (1993; 2011), one of the frontier scholars of this field, noted CBBE evaluated consumer's response to a brand name and functionalized under people's cognition or trace of this brand node in consumers' memory. This view evokes consumers' cognition perceptions and feeling that bounded with the brands; therefore, a representing of "indirect" approach. A "direct" approach would measure directly by assessing the actual impact (such as the revenue) of a brand node on customer response to different elements of marketing programs (Leone et al, 2006). It is "a set of brand assets and liabilities linked to a brand, its name and symbol that add to or subtract from the value provided by a product or service to a firm and/or to that firms' customers" (Aaker, 1991, p.15). Both approaches manipulate the general consideration on price competition; instead, pointing out that companies' capabilities such as product differentiation or follow-up services can deliver competitive advantages based on non-price competitions.

CBBE is one of the essential assets for business performance (Aaker, 1991; Keller, 1993; Nah, Eschenbrenner & DeWester, 2011). From practitioners' point of view, CBBE contributes fully in the new consumer decision paradigm. Referring to McKinsey's "The consumer decision-journey" (2009), the traditional funnel journey started with a set of brand options and methodically reducing that number to make a purchase, resulting in the customer

loyalty. The new circulated journey is going through four phases: (1) Consumers' *initial consideration* toward a set of brand based on brand perceptions and exposure; (2) consumers' *active evaluation* toward products/services or brands based on generated information such as reviews to narrow down the options; (3) *actual purchase* a product/services; and (4) consumers' *post-purchase experiences* that allows them to build expectations based on the purchase experiences to inform the next decision journey (Mckinsey, 2009). Consumers are empowering to interrupt the loyalty loop from each stage, and what matters the most for brands is to boost their CBBE in order to participate in consumers' initial considerations. Noting that such a journey applies extremely when consumers purchase expensive goods, such as auto, luxury goods, properties or stocks; CBBE concept is thus important.

Yoo et al (2000) had highlighted the need to refine and measure CBBE constructs, which investigated by a set of marketing activities such as PR, advertising and promotion events. They extended Aaker's (1991) model and developed a conceptual framework to structuralize the "antecedents (marketing activities) - (CBBE) dimensions - brand equity" relationship (Yoo et al, 2000). Townsend et al (2012) validated this model by conducting data from a longitudinal study of the automotive market. Yoo et al's (2000) model warranted the importance of marketing mix as fundamental variables in creating brand equity. Despite the different measurement dimensions, scholars resembled models from Yoo et al (2000), concluding that advertising helped to increase brand equity (e.g. Kirmani & Zeithaml, 1993; Nikabadi, Safui & Agheshlousi, 2015). Instead of adopting the full model of Yoo et al's (2000), this study uses their "antecedents-dimensions" framework to modify the relationship between types of commercial video and CBBE dimensions.

2.3 The Difference between CBE and CBBE

Most engagement draws CBBE as consequences, reinforcing at customer level (e.g. cognitive, attitudinal, emotional and customer equity) and firms level (brand equity such as reputational and competitiveness) (van Doorn et al, 2010). Despite, most scholars also recognize the specific cyclical integrative dynamics during the engagement process (e.g. van Doorn et al, 2010; Brodie et al, 2011). In the circular paradigm, engagement consequences such as CBBE or consumers' attitudes may extend to act as engagement antecedents in subsequent engagement process, and cycles over time (e.g. van Doorn et al, 2010; Brodie et al, 2011). Integrating the new customer decision journey pattern (Mckinsey, 2009), comparatively, the level of customer satisfaction increased because of the positive interactive experiences toward brands' services or products that generate from the engagement process; naturally, enhancing the general satisfaction of the brand. Satisfaction of the brands instructs them further to the next purchase journey; hence, CBBE acts as an antecedent.

Boyle (2007) merged a five-stage process model of brand concretion through engagement theory: (1) new product development with unique perceived product attributes; (2) brand awareness creation through marketing communications; (3) consumer interpretation of marketing communication to pre-consumption brand association; (4) consumption of the product and the promotion of post-consumer associations; and (5) repurchase and the intensifying perception of perceived benefits that lead to brand loyalty. Kuvykaite and Piligrimiene (2014) reviewed multitude theories to address the relationship between

engagement and CBBE, and concluded that their relations reflect from "… the changes in brand equity dimensions (familiarity, perceived quality, association and brand loyalty) after engagement, levels of consumer engagement (cognitive, affective and behavioral) and personal consumer characteristics (awareness, perceived role clarity, ability, willingness to participate) that are important for identification of consumers, who should be engaged into brand equity creation" (p.482).

Boyle (2007) and Kuvykaite and Piligrimiene (2014) exhibited the intertwining relationship between two concepts, however, little had been identified regarding the differences. This paper argues the difference between CBE and CBBE may occur in the measurements. Specifically, engagement measurements are judged by one's overall experiences in terms of what and how stimuli present; CBBE assessed purely on one's perception of the brand *per se*. Recalling from the circular paradigm, consumers interact with stimuli directly during the engagement process. Nonetheless, the consumers' perceptions can be changed after the engagement process; subsequently, affecting on consumers' attitudes of a brand (the CBBE). CBBE further empowers consumers on whether to consider this particular brand as the initial choice. Thus, this paper discloses such discussion and states that engagement can be measured by all kinds of characteristics of the stimuli but CBBE only assessed brand *per se.* In addition, although literature reviews found a vice verse ordering effect between CBE and CBBE; herein, this paper pertains a non-ordering effect to structuralize the direct impact of 360-degree commercial campaigns.

3. Research Hypotheses

3.1 Perceived Innovativeness

Innovativeness is directly linked to the development of firms in which becomes the key determinant of the knowledge economies to cope with (Kaplan, 2009). Diffusion of Innovation Theory defines innovation as the degree of interest in trying a new thing, a new concept, or an innovative product or service (Rogers, 1983). It is some forms of combination between product, process, market, input and/or organizations (Schumpeter, 1961). The benefits of being innovative are massive. For instance, in a context of organizational innovativeness, the internal and external stakeholders perceive firms being innovative can largely influence on organizations' futures (Kaplan, 2009). In the product or process innovation, higher innovativeness effect on the brand image (e.g. Townsend et al, 2012) and consumer values (e.g. Zhang, Liang & Wang, 2016).

Investigating perceived innovativeness from consumers is valuable for firms. Kaplan (2009) noted that a knowledge-driven economy is characterized with highly innovative firms. For instance, Apple Inc prototypes innovation in the organizational level; and consumers perceived Apple, organizationally and culturally, is a creative powerhouse. In other words, an innovative firm may initiate in the brand image structure. If 360DCVS is perceived as innovative way to introduce new things, a good indication is that it reflected how well the brands are able to cultivate a high level of technology and marketing strengths to integrate in their innovation mechanism (Matsuno, Zhu & Rice, 2014); such image can consequently absorb by consumers, cognitively. Agarwal and Karahanna (2000) claimed that a higher level of perceived innovativeness influence consumers' attitude on a product or a brand, which incrementally influence on consumers' behavior intention and purchase behavior. Meanwhile, prior innovation research pointed out that brands' being innovative in products, processes and business models could attract new customers, engagement, and stimulates business growth (Matsuno et al, 2014). In another word, a higher level of innovativeness that perceived by consumers/stakeholders is meaningful for firms.

360DCVS is poised as cutting-edge innovation, companies that leveraging 360DCVS innovate their product introduction and marketing process. On the basis of conceptual grounds, 360DCVS is expected to associate with perceived innovativeness and might pertain a higher degree of perceived innovativeness than TCVS. The hypothesis is developed as follows:

H1: The 360DCVS has a higher level of perceived innovativeness than the TCVS.

3.2 Perceived Enjoyment

An alternative stream of engagement research that derives from psychology posits that an individual behavior toward new technologies is shaped by the holistic experiences with the technology (Agarwal & Karahanna, 2000). The research that focuses on the virtual world and human-computer interaction has often adopted the Flow theory, which was proposed by Csikszentmihalyi (Nah et al, 2011). Flow captures the holistic sensation feelings of individuals when they act on total involvement of stimuli. It refers to an optimal state of experience where one is completely absorbed and engaged in an activity (Csikszentmihalyi,

1997). One of the major concepts of Flow indicates individuals' subjective enjoyment of the interaction with the technology (Csikszentmihalyi, 1997). Enjoyment has been empirically granted as a significant predictor of several technology models (e.g. van der Heijden, 2003), and often acts as a salient emotion construct to measure engagement (Brodie et al, 2011).

Perceived enjoyment has been validated in numerous technology models as an important indicator of behavior intention from a given technology innovation. The Technology Acceptance Model explains that perceived enjoyment influence online usage behavior directly (Davis et al, 1992; Van der Heijden, 2003). Lee and Lee (2011) utilized the Theory of Reasoned Action, demonstrating entertainment provoked a positive impact on consumers' attitude, which further affected the intention to watch online ads. Perceived enjoyment is therefore the experiential value that comprises positive engagement experiences with a focal brand.

Some researchers also deployed the importance of perceived enjoyment in a digital (advertising) context. Raney, Arpan, Pshupati and Brill (2003) noted that entertaining websites driven auto advertisement effectiveness. They revealed that highly entertaining sites, measuring by a mini, suspenseful movie, was associated positively with the greatest intent to return to the site (Raney et al, 2003). Parise, Guinan and Kafka (2016) applied the S-O-R model in the omnichannel context; their findings suggested that the digital technology stimuli had the greater impact on the customer's experiences, including immersion, flow, cognitive and emotional fit. They defined Flow in a technology-mediated environment as "the degree to which the user navigates successfully across multiple touch points" (Parise et al, 2016, p. 413), which resulted in an enjoyable user experience (Parise et al, 2016). Nah et al (2011) examined the enjoyment in the 3D versus 2D context and found that enjoyment was realized highly in the 3D virtual environment because of the sensory richness that triggered higher levels of enjoyment experiences with the interactive pattern. However, a later research revealed some contradictory findings. Visinescu, Sidorova, Jones and Prybutok (2015) found that websites with the 3D design for first-time visitors reported significantly lower degree enjoyment than websites with the 2D for the first-time visit to the websites; and found no association with frequent visitors. Perceived enjoyment is thus an intriguing construct.

As the 360-degree video is employed from the computer gaming industry, one of the greatest intentions to leverage this campaign is certainly to entertain consumers and beyond. Therefore, it is expected that perceived enjoyment is associated with the 360DCVS; and able to achieve a higher level of enjoyment than TCVS:

H2: The 360DCVS has a higher level of enjoyment than TCVS.

3.3 Engagement Behavior

Engagement behavior occurs among consumers after marketers perform their marketing mix through advertising or promotions (Kozinets, de Valck, Wonjnicki & Wilner, 2010). Behaviors such as affective response, usage and attentiveness, and reactions to an ad are driven by the interactive experiences (Brodie et al, 2013; Calder & Malthouse, 2015). Word-of-Mouth (WOM) or eWOM is the specific affective behaviors to pass information about products or services in an engagement context (Van Doorn et al, 2010; Hayes, King & Ramirez, 2016). Consumers, therefore, regard as active co-producers of responding

organizations' marketing efforts. Online forwarding is a specific characteristic of eWOM that facilitate information flow (Godey et al, 2016). Click-through behavior (Calder & Malthouse, 2015), revisiting behavior (Raney et al, 2003) and information seeking (Ko, Cho & Roberts, 2005) are some examples of usage and attentive behavior. These behaviors do not aim at generating and disseminating information. Reactions to an ad might generate from consumers' effort to interact with ads, such as time and monetary investment (van Doorn et al, 2010).

Shao (2009) illustrated three major social media interactive usage behaviors, namely consumption, participation and production. Content consumption is a passive behavior that refers to individuals who only watch, read, or view information but does not respond. Participating behaviors include interaction such as following a brand's Facebook page, hashtag brands in their own post; commenting, sharing and liking brands' post. Producing comprise the actual publishing of the contents such as text, images, audio and video, based on the self-expression or self-actualization motivations (Shao, 2009). Both participating and producing behavior are seen as active participation. Active users are conceptualized under participation where users interact with posts such as like, comment, share and upload that promotes further engagement (Khan, 2017). For the marketer, the active approach utilizes social media as tools of communication, direct sales, customer acquisition and customer retention (Constaintinides, 2014). Intuitively speaking, if a positive engagement behavior takes place, the greater the marketers receive benefits.

Given the recent appearance of 360DCVS for advertising purpose, more engagement behaviors are expected from consumers in comparison to TCVS. This paper generates engagement behavior as the sum of the positive engagement activities that consumers intend to perform, regardless of passive or active; thus proposing:

H3: 360DCVS has a greater positive impact on engagement behaviors than TCVS.

3.4 Customer-based Brand Equity Dimensions

CBBE is generally considered as multidimensional concepts (Townsend et al, 2012), coinciding with the brand equity and the customer equity jointly. Both concepts are interchangeable in most cases. Kamakura and Russell (1991) viewed CBBE as perceived brand quality of both the brands' tangible and intangible components and defined as the different effect of brand knowledge on consumer response to brand's marketing efforts. It mostly occurs when the consumer is familiar with the brand and holds some brand-related association in the memory (Kamakura & Russell, 1991). The distinction exists from the managerial perspective: the brand equity emphases on the brand management, judging by the marketing values and growth opportunities of a company. On the other hand, customer equity prioritizes customers, tracking customer lifetime values (e.g. Rust, Zeithamal & Lemon, 2004) but also measuring financial values (Blattberg & Deighton, 2010).

From the previous discussions in terms of the definition of CBBE, the "direct" approach is conditioned on assets management. Leone et al (2006) directly endorsed that the center of the customer equity lies in the customer relationship management, and assesses by the financial values. Albeit much research holds the views that the brand equity contributes to increasing customer equity (e.g. Godey et al, 2016; Kim et al, 2016), the two concepts should be seen as interrelated, such that "marketing actions to improve customer equity can also

improve brand equity and vice verse" (Leone et al, 2006, p.131). Therefore, this paper does not give an order regarding what causes another.

The full scope of CBBE measurements includes loyalty, perceived quality, associations, and awareness (Fayrene & Lee, 2010). Despite the disagreement regarding what comprises the brand equity, empirical findings in an online context are agreed upon brand knowledge dominant brand equity. The brand equity model that Keller (1993) domination explained brand knowledge was comprised by the brand awareness and image. Brand awareness is the strength of the brand node, which likely occurs in consumers' recognition toward the brand as well as the ease with which it does so (Keller, 1993). Accordingly, the brand image is the perceptual recognition about a brand that is reflecting in consumers' memory reflects (Keller, 1993). Hence, brand awareness is discriminative from brand image. On the other hand, Yoo et al (2000) perceived the brand awareness was interchangeable with the brand image/association, though the differences might occur: brand image is a set of brand association – anything linked in memory to a brand (Aaker, 1991) – in a meaningful way (Yoo et al, 2000). Similarly, empirical research often adopts brand awareness as a representable construct, sometimes including brand association and/or brand image, to measure ads effectiveness (e.g. Bruhn, Schoenmueller & Schafer, 2012) or YouTube advertising (e.g. Dehghani, Niaki, Ramezani & Sali, 2016).

Despite the disagreement regarding whether brand awareness is indifferent from the brand image; most researchers agree that brand awareness fully contributes to the brand equity. Additionally, traditional commercials and social media commercials were reported as one of the most influential marketing efforts on brand equity creation (e.g. Kirmani & Zeithaml, 1993; Townsend et al, 2012; Nikabadi et al, 2015; Dehghani et al, 2016), this study expects 360-degree commercials have the same influence, and even more impacting on brand equity creation. Avoiding the discussion in terms of the distinctions between brand awareness and brand image, though little had been discovered, the hypothesis is purposed:

H4: 360DCVS has a greater positive impact on brand awareness than TCVS.

Customer equity takes consumers perspective to reveal the effectiveness of firms' marketing performance, customer values and potential financial values (Blattberg & Deighton, 2010). Typical measurements shall therefore reflect on the consumers' purchase response, or at least, the purchase intention. Hence, many reflective terminologies such as brand loyalty, brand preference and/or customer satisfaction are purposed to exam this construct (e.g. Aaker, 1991; Keller, 1993; Yoo et al, 2000; Godey et al, 2016). Considerably, this study favors brand loyalty and brand preferences to assess them conjointly as the sum of customer equity. Brand loyalty (a behavioral response or purchase intention over time regarding one or more alternative brands from a set of brands) and brand preferences (consumers' preferences about a brand on the basis of what they know and feel about by giving several competing brands) (Keller, 1993) had been empirically affirmed as the unarguable terms for assessing customer equity (e.g. Liang & Turban, 2011; Cambra-Fierro et al, 2013; Kim et al, 2016).

Auto advertisements in an online traditional video context had been confirmed that TCVS contributed to CBBE (Townsend et al, 2012). Dehghani et al (2016) demonstrated the YouTube Advertising plays an important role in forming customer purchase intention. Hence,

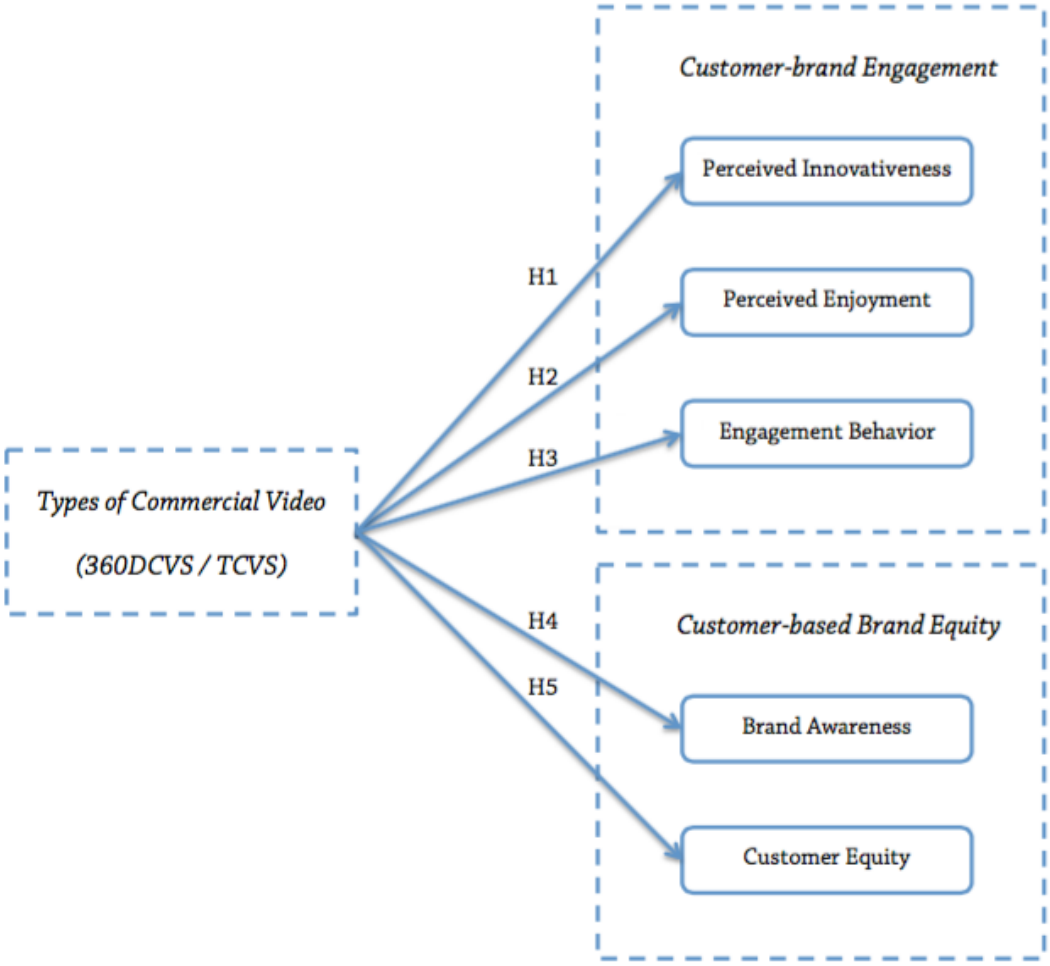
given the context of immersion video, this study also expects 360-degree commercials will achieve, and even react better on the customer equity.

H5: 360DCVS has a greater positive impact on customer equity than TCVS.

3.5 Hypotheses Model

Figure 1 presents the hypotheses model for this research.

Figure 1: Hypotheses model for the present study



4. Research Design

The experiment is designed to compare 360DCVS versus TCVS and their impact on five constructs. The subjects are divided into two groups and exposed to one of the two experimental scenarios, and subsequently, respond to survey question. Group A is assigned to watch 360DCVS; Group B is assigned to TCVS scenario. This chapter explains the overall research design in terms of the case selection and data collection.

4.1 Video Case Selection

The rationality of selecting suitable video case was employed by a two-step approach. The first step was to determine the video selection criteria based on the objective of this paper. The alternatives of video contents can subsequently influence the results; hence, a pretest was conducted to determine the suitable case before the full-scale data collection.

The first criterion was to find out two officially released commercials that have two types of video solutions. To do so, I compared multitudes of brands that operationalized in different disciplines and searched video through brands' official YouTube Channels. Brands included automotive (Mercedes, BMW, Volkswagen, Volvo, Citroen and Peugeot); hospitality (Hilton, Hyatt, Marriott, and Sheraton); airlines (Etihad, Emirates, KLM, Lufthansa, Scandinavian, Delta, United Airline, Cathay Pacific and China Southern); luxury fashion (Chanel, Louis Vuitton, Fendi, Gucci, Balenciaga, Bulgari, Breitling and Rolex), apparel (Nike, Adidas, G-Star, Diesel, Tommy Hilfiger, and Ralph Lauren), fast consuming (P&G and Unilever), and beverage sector (Coca-Cola and Heineken). The reasons to narrow down to these brands were twofold. First, these brands have the capabilities to deliver 360-degree commercial campaigns, thanks to their large marketing expenditures. Second, these brands have already been a large base of seemingly recognizable VR business presences in the global market.

The second criterion was to evaluate the similarity of both video contents, for it ruled out changes in CBE and CBBE are caused by the content rather than the video solutions. Thus, in order to identify the content congruency in both video, the selection followed the assessment criteria: both video should (1) delivered by the same brand (line), (2) introduced the same product and concept, (3) performed by the same brand ambassadors, and (4) featured in the same place. In the end, there were three options:

Option 1: Channel Allure Homme Sport Cologne

360DCVS: https://www.youtube.com/watch?v=HvFNq3dsLlo&index=1&list=PLzZkh7mnSyo4rQ0Uex49W9MvABGylYOeO

TCVS: https://www.youtube.com/watch?v=Th8zwXCLY0c&list=PLzZkh7mnSyo4rQ0Uex49W9MvABGylYOeO&index=10

Option 2: SAS Scandinavian Airline Cabin Introduction

360DCVS: https://www.youtube.com/watch?v=MiilOC5Qgow

TCVS: https://www.youtube.com/watch?v=5Q3Cn_PE3QA&t=81s

Option 3: Mercedes-Benz GLS full-size SUV Campaign

360DCVS: https://www.youtube.com/watch?v=vVNylwQRUQM

TCVS: https://www.youtube.com/watch?v=arZVGwhfkoA

Option 1 was precluded due to the abstract ad presentation for introducing their product. Precisely, the 360DCVS caused confusion regarding the brand and their introduced perfume, since people who were unfamiliar with perfume were unlikely to identify what message did brand try to deliver. Although both scenarios matched the aforementioned criteria, they were inappropriate to run the experiments.

The second step was to run a pretest to determine the suitable case from the remnant of the options. I randomly asked seven acquaintances between ages of 25 to 32 to rate their preferences based on the content of 360DCVS. Five of whom preferred option 3 because of the vivid content. I further referred to YouTube video statistics of both 360-degree videos that were retrieved on 10th of February 2017. The statistics revealed that Option 1 had a driven subscription of 1 and share of 5. Option 3 had driven subscriptions of 26 with 444 shares. Hence, Mercedes-Benz Loki Campaign was assigned to run the experiment.

4.2 Survey Interpretation

This study utilized Google Forms to conduct data, since it allowed researchers to insert video when designing questionnaires. Two questionnaires were developed and both designs followed a specific order. The first section presented the experimental video. The second section required respondents to fill out the questions in order to capture their demographic information. The demographic information of this paper consulted Nah et al (2011) and Visinescu et al's (2015) examination, by asking the gender, age, pre-knowledge about the commercial, prior experiences toward types of commercial video and pre-knowledge about the brand. The distinctions between questionnaires were the inserted video as well as the way of asking "prior experiences toward types of commercial video solution" in the demographic information section (Appendix A). Specifically, Group A's questionnaire inserted the 360DCVS video; consequently, subjects were asked, "Do you have experiences of watching 360-degree commercial video in general?" Group B was exposed to the TCVS scenario and subsequently indicating whether they had experiences with watching TCVS. In the last section, the respondents rated their level of agreement on sentences that associated with five constructs. Both questionnaires utilized the same measurements.

The data collection was spanned from 18th of April 2017 till 18th of May 2017. The questionnaires were distributed to some Facebook online communities and car forums. To reduce possible biases from the same responses, both questionnaires were sent out through different online communities randomly. For instance, Group A's questionnaire was posted on the "Luxury Cars" Facebook group, but Groups B's questionnaire would not have appeared on this specific group again.

4.3 Measurement Instruments

Rather than developing specific measurement instruments, the scales were subjected to numerous replications and sentences in order to create firmly higher statistical stability. Items were measured on seven-point Likert-type scales with 7 representing "entirely agree", 4 representing "neutral" and 1 representing "entirely disagree". Appendix B presents the full scopes of measurement items.

Sentences related to perceived innovativeness (three items) and perceived enjoyment (three items) adapted keywords from Zhang et al (2016), Koufairs' (2002) and Nah et al (2011), ensuring sentences were aligned closely with the experimental subject. For instance, Koufairs' (2002) scales were used to measure the perceived enjoyment. The original sentence "I found my visit interesting" (Koufair, 2002, p. 219) was translated to "It is interesting when watching this commercial".

Eight items measured engagement behavior, and five of which were adopted from existing literature. Three self-reported sentences were developed based on definitions accordingly. For instance, one sentence that aimed at assessing the active engagement behavior is based on Shao (2009) and Khan's (2017) active participative definition. The sentence therefore formulated as: I'm likely to hashtag (#), at (@), or engage other forms of activities with this commercial post through social media account if my post has the same features showed in the commercial (e.g. SUV, husky and/or Mercedes).

Items that measure brand awareness and customer equity utilized Aaker (1991), Keller (1993), Yoo et al (2000), Nah et al (2011) and Godey et al's (2016) instructions. All sentences were specified the brand name, which was differed than these researchers' measurement items. For instance, the original sentence to measure brand awareness "I can quickly recall the symbol or logo of brand X" was translated into "I can quickly recall the symbol or logo of Mercedes".

Herein, to note, since it was not able to confirm or observed the actual engagement behavior of participates; items that refer to "engagement behavior" in this article were all subjecting to consumers' intentions to perform positive engagement activities.

5. Data Analysis

The data analysis follows Henseler's (2016) instruction regarding the Multivariate Analysis of Variance-Covariance (MANOVA / MANCOVA). This technique is appropriated when the independent variable is categorical; and more than two dependent variables are metrical (Henseler, 2016). Details of the data analysis are presented below.

5.1 Demographic Information

This paper utilized random samples and a total of 198 respondents participated in this study. Removal of incomplete responses resulted in 187 usable responses. Meanwhile, demographic data had tackled two exceptions from TCVS data beforehand. Specifically, only one respondent filled in "prefer not to say" for Gender categories, and one respondent filled in "yes" when asking whether she had watched the commercial before. Thus, the data set excluded these two samples and observed 185 respondents.

Demographic data are employed in order to identify the demographic differences between experimental groups (Table 1). Evidently, the sample size is adequately equal between two groups, though the 360DCVS (N=94) are slightly higher than TCVS (N=91). Due to a small sample size between groups, the alpha value for the analysis was set as .10. The chi-square tests are performed to check the differences between groups and find insignificant between age and types of video solution (VideoType), but there is significant difference between genders and VideoType.

The participants were also asked whether they had watched the assigned commercials before (PreCommercial) and whether they had pre-knowledge about the brand (PreBrand). Table 1 illustrates PreCommercial for "no" option and PreBrand for "yes" option is accounted for all observations. Thus, this dataset only reveals the effectiveness of responses that have prior knowledge about the brand and have watched the commercial for the first time. Additionally, when asking about whether subjects have prior experience with the type of video solution (PreExperience), the Chi-square test observes a significant difference (Chi-square =84.019; df=1; $p<0.001$). More subjects in the TCVS group are having had prior experiences with the assigned scenario compared with the 360TCVS.

5.2 Confirmatory Factor Analysis

The confirmatory factor analyses assess whether the items were loaded correctly with five constructs. All statistics can be referred to Appendix C. The Kaiser-Meyer Olkin (KMO) and Bartlett's test suggested a sufficient correlation among 23 items: the KMO (.841) is higher than the recommended value of .60 and Bartlett's test is significant ($p= .000 < .10$). Thus, no deletion is needed to continue the component analysis.

Table 2 presents the factor loading after rotation and constructs' reliability test. Factors extraction had been set up as "five" before running the analysis. PI and PE are correlated ($p= .011 < .10$), indicating the oblique rotation should be applied. Table 2 declares that five factors are loaded perfectly in accordance with the proposed hypotheses model. However, the factor loading suggests removing EB2 (-.322) since the absolute value is lower than 0.5; the reliability test should further use to determine whether to delete the EB2 beforehand.

Table 1: Demographic Information

Category	Number of respondents	% of respondents	Chi-square/T-test for the difference between 360DCVS and TCVS
The type of video solution (VideoType)			
For 360DCVS	94	50.8%	
For TCVS	91	49.2%	
Gender			
For 360DCVS			
Male	63	34.0%	
Female	31	16.8%	.023
For TCVS			
Male	46	24.9%	
Female	45	24.3%	
Age			
Mean		30.11	
Median		29	.206
Mode		30	
Minimum		20	
Maximum		61	
Pre-knowledge about the commercial (PreCommercial)			(No statistics are computed)
No	185	100.0%	
Pre-experience about the video solution (PreExperience)			
For 360DCVS			
Yes	30	16.2%	.000
No	64	34.6%	
For TCVS			
Yes	88	47.6%	
No	3	1.6%	
Pre-knowledge about the brand (PreBrand)			(No statistics are computed)
Yes	185	100.0%	

Chronbach's alpha coefficient measures the reliability and the amount of useful variance. The alpha coefficients (Table 2) of four constructs are above the generally recommended limit of .70. Accordingly, EB2 had been kept thanks to a satisfactory reliability test (Chronbach's α = .879). However, BA (Chronbach's α = .660; N=4) shows an unsatisfactory degree of reliability; and could not be improved by removing any of the items. Thus, BA does not statistically reliable in terms of the Chronbach's alpha coefficient.

Table 2: Result of the Pattern Matrix with Oblimin Rotation of the Items and Cronbach's Alpha

	Component					Cronbach's Alpha
	1	2	3	4	5	
CE5	.934					.919
CE1	.860					
CE3	.843					
CE4	.798					
CE2	.795					
PE1		.844				.797
PE2		.842				
PE3		.703				
BA2			.883			.660
BA3			.617			
BA1			.616			
BA4			.445			
EB4				-.873		.879
EB3				-.750		
EB6				-.640		
EB7				-.577		
EB5				-.550		
EB1				-.506		
EB8				-.480		
EB2				-.322		
PI1					.799	.740
PI3					.792	
PI2					.723	

Note: PI=Perceived Innovativeness; PE=Perceived Innovativeness; EB=Engagement Behavior; BA=Brand Awareness; CE=Customer Equity

5.3 MANOVA Assessment of Measurement Model

All values of this subchapter can be retrieved from Appendix D. The constructs were computed with the mean scores of correlating items based on the Table 2 in order to compare the mean values and their positions in the seven-point Likert-scale. The data are a little skewed and kurtotic for both scenarios but they do not exceed the threshold of -1 to 1, meaning the data are normally distributed in terms of skewness and kurtosis. However, the Shapiro-Wilk test suggests otherwise; only EB from 360DCVS's data has normality. Thus, caution should be made as two tests pointed out differently.

The Box's Test (Box's M=19.373; F=1.254; Sig.= .223 >.10) is non-significant, suggesting a normally distributed of variance between groups. It also implies the Wilks' Lambda test should be applied to this data set. The Levene's Test shows that EB (F (1, 183)=6.839; p= .003) and CE (F (1, 183)=4.161; p= .043) are significant, indicating the equal

variance assumption is violated. However, given that the sample sizes are equal between groups, the violation of this assumption is modest (Henseler, 2016). Hence, all constructs are assumed the normality.

5.4 MANOVA Analysis and Hypotheses Testing

The MANOVA results (for all statistics of this subchapter, see Appendix E) find that there is a significant difference between 360DCVS and TCVS when considering jointly on the five dependent variables (F (5, 179)=9.178, p= .000 <.10; Wilks' Λ = .792; partial η 2 = .204) with computed alpha value of .10 and observed statistical power of 1. When evaluating individually, little has been explained (Table 3). The outcomes regarding between-subject effects use an alpha value of .025 (the original alpha value is .10, and therefore divided by five dependent variables) to protect against Type I error. In this recognition, only CE is observed a meaningful value (F (1, 183)=26.956; p= .000 < .025; partial η 2 = .128); with mean scores of TCVS (M =4.921, SE= .134) higher than 360DCVS (MCBBE=3.921, SE= .132), observed by a power of 1.000. Thus, hypothesis 5 is rejected. When using alpha values of .10; the EB (F (1, 183) = 2.895; p= .091 < .10; partial η 2 =.016) becomes meaningful; and consequently, hypothesis 3 can be rejected.

Finally, although there are no statistical differences between VideoType and the remaining constructs, the mean scores of PI, PE and BA from 360DCVS group are above 5 in a 7-point Likert-scale; but participants are most unlikely to perform positive engagement behavior toward both types of commercial video. Additionally, 360DCVS group from this dataset is unlikely to perform customer equity.

Table 3: MANOVA Results and Estimates with Computed Alpha Value of .10

Dependent Variables	Video Type	Mean (Std. Error)	Between-Subjects Effects
Perceived Innovativeness	360DCVS	5.138 (.088)	F= .073; P= .787; Partial η 2= .000
	TCVS	5.172 (.089)	
Perceived Enjoyment	360DCVS	5.007 (.101)	F= .311; P= .578; Partial η 2= .002
	TCVS	4.927 (.103)	
Engagement Behavior	360DCVS	3.515 (.117)	F=2.895; P= .091; Partial η 2 = .016
	TCVS	3.798 (.119)	
Brand Awareness	360DCVS	5.912 (.075)	F= 1.475; P= .226; Partial η 2= .008
	TCVS	5.783 (.076)	
Customer Equity	360DCVS	3.943 (.132)	F= 26.956; P= .000; Partial η 2= .128
	TCVS	4.921 (.134)	

5.5 MANCOVA Analyses and Hypotheses Testing

The study further performs the Multivariate Analysis of Covariance (MANCOVA) to check whether there are any blocking variables that affect on MANOVA results. Possible covariates for this study are Age, Gender and PreExperiences. The subchapter 5.5.1 provides detailed procedures regarding normality test for the age as the covariate; values can be found

in Appendix F. Two separate MANCOVA analyses in terms of the normality test description for gender and PreExperiences are explained in Appendix G.

5.5.1 Age as the Covariate

The age group was computed based on Nah et al's (2011) divisions into metric variables before running the MANCOVA. The data across age group 2: 26-35 (360DCVS: N=65; TCVS: N=62), and age group 3: 36-45 (360DCVS: N=7; TCVS: N=8) have an equal sample size. The Chi-square test observes a significant relationship between Age and VideoType (Chi-square=6.766; df=1; p= .080 < .10). The data are normally distributed between the age group and dependent variables. Due to zero respondents in TCVS' age group 4, the data are kurtosis to the left, ranging from -1.534 to -2.829. The Shapiro-Wilk test exhibits significant values of BA, and among all dependent variables for age group 2. Consequently, the data cannot assume the normality in terms of age group 4; and caution should be excised regarding age group 2 and brand awareness.

The normality test is significant, indicating by the Box's Test (Box's M=19.373; F=1.254; Sig.=.223). The Levene's Test for PI, PE and BA explains the significant variances among cells. Despite, the Wilks' Lambda test reports that Age (F (5, 177)=5.436, p= .000 <.10; Wilks' Λ = .866; partial η 2 = .134) causes differences on the dependent variables, with an observed power of .996. Meanwhile, the interaction between VideoType and Age scored insignificant (F (5, 177)= .937, p= .458 > .10; Wilks' Λ = .974; partial η 2 = .026); resulting in a non-interactive covariate relationship.

After controlling the age, Table 4 reveals that PI and PE become significant when comparing with an alpha value of .025; the observed power is all above .90. EB becomes significant if uses the alpha value of .05. Yet, these constructs do not affect on VideoType; only CE achieves the significance (F (1, 182)=26.174; P= .000 < .025; partial η 2 = .126; Observed power = 1.000). The Bonferroni test affirms such findings. As there are no interactions between independent variables, the Estimates data could be interpreted directly. The findings appear to be considerably lower on 360DCVS (Mean=3.944; SE= .133) than TCVS (Mean=4.920; SE= .135) in terms of CE. Therefore, hypothesis 5 is rejected.

Table 4: MANCOVA Results and Estimates: Age*VideoType

Dependent Variables	VideoType	Covariates: Age		Mean (Std. Error)
Perceived	F= .105; p= .747;	F=19.559; p= .000;	360DCVS	M= 5.174 (.084)
Innovativeness	Partial η 2= .001	Partial η 2= .097	TCVS	M= 5.135 (.085)
Perceived	F= .935; p= .335;	F=8.668; p= .004;	360DCVS	M= 5.035 (.099)
Enjoyment	Partial η 2= .005	Partial η 2= .045	TCVS	M= 4.898 (.101)
Engagement	F= 1.967; p= .162;	F=4.814; p= .030;	360DCVS	M= 3.539 (.116)
Behavior	Partial η 2= .011	Partial η 2= .026	TCVS	M= 3.773 (.118)
Brand Awareness	F= 1.863; p= .174;	F=1.380; p= .242;	360DCVS	M= 5.921 (.075)
	Partial η 2= .010	Partial η 2= .008	TCVS	M= 5.774 (.076)
Customer Equity	F= 26.174; p= .000;	F= .009; p= .924;	360DCVS	M= 3.944 (.133)
	Partial η 2= .126	Partial η 2= .000	TCVS	M= 4.920 (.135)

The data are further split based on the Age Group (Table 5). Signifying that TCVS have no responses from the age group 4, it is meaningless to interpret this group. Alerting from Table 5, the Bonferroni pairwise gives more new insightful comparison. EB attained significant on age group 3 (p= .009 < .10). In particular, TCVS (Mean=3.813; SE= .395) is higher than 360DCVS (Mean = 2.589; SE= .422); though the values are all below 4 in the Seven-point Likert-scale. CE affects age group 2 and age group 3, and both groups load higher on TCVS. A tendency is observed that 360DCVS has a decreasing value of CE when age increase and counteracted when examining TCVS.

Table 5: Justified Descriptive Statistics with Pairwise Comparison on Age*VideoType

	VideoType	1 (19- 25)		2 (26-35)		3 (36-45)	
	360DCVS	N=16 (8.6%)		N=65 (35.1%)		N=7 (3.8%)	
	TCVS	N=21 (11.4%)		N=62 (33.5%)		N=8 (4.3%)	
Dependent Variable		Mean	Sig	Mean	Sig	Mean	Sig
Perceived Innovativeness	360DCVS	5.521	.765	5.174	.529	4.619	.462
	TCVS	5.587		5.075		4.833	
Perceived Enjoyment	360DCVS	5.167	.977	5.087	.335	4.619	.683
	TCVS	5.159		4.914		4.417	
Engagement Behavior	360DCVS	4.141	.377	3.496	.147	2.589	.009
	TCVS	3.804		3.794		3.813	
Brand Awareness	360DCVS	6.078	.456	5.904	.132	5.750	.611
	TCVS	5.929		5.710		5.969	
Customer Equity	360DCVS	4.188	.212	3.982	.000	2.857	.001
	TCVS	4.724		4.923		5.425	

5.5.2 Gender as the Covariate

The normality test suggests data are normally distributed in terms of skewness and kurtosis for gender groups; only EB data for female is a bit skewed (1.061). The Wilks' Lambda test observes strong interaction between VideoType and Gender (F (5, 177)=23.367, p= .000 < .10; Wilks' Λ = .660; partial η 2 = .398); implying an extra assessment is required other than the Estimates. Table 6 is the MANCOVA results when controlling gender. The Estimate signifies that gender affects EB (F (1, 182)=8.264, p= .005< .025; partial η 2 = .043) and CE (F (1, 182)=35.817, p= .000 < .025; partial η 2 = .164); and both mean values obtained from 360DCVS groups are lower than TCVS.

The pairwise outcomes (Table 7) after splitting the data should be used to interpret the result. 360DCVS receives lower impact on PI, EB and CE for the males group. On the contrary, females score higher on 360DCVS for the remaining constructs. Such outcomes imply a disordinal interaction between VideoType and Gender (Henseler, 2016), suggesting a separate interpretation is needed to validate the hypothesis model.

To start with, PI is affected by gender. Specifically, females expose to the 360DCVS scenario (Mean=5.237; SE= .149) perceive higher innovativeness than TCVS (Mean=4.807; SE= .121). Males state otherwise. Hence, hypothesis 1 is supported by the female group but

not by the male group. In terms of EB, males are unlikely to perform engagement activities from 360DCVS group (Mean=3.603; SE= .124) in comparison with TCVS (Mean=4.592; SE= .145). Consequently, hypothesis 3 is rejected for male groups. In terms of CE, when one looks at mean values of CE, males incline much lower acceptance on 360DCVS (Mean=3.683) than TCVS (Mean=5.976); dragging down the overall mean. But the relative impact of customer equity on 360DCVS is higher in the female sample than the males; consequently, the hypothesis 5 is rejected by the male group but supported by the females. However, the overall results tend to use male group's decision. The causes here might because male participants are greater than females.

Table 6: MANCOVA Results and the Estimates: Gender*VideoType

Dependent Variables	VideoType	Covariates: Gender		Mean (Std. Error)
Perceived	F= .455; p= .501;	F=5.825; p= .017;	360DCVS	M=5.113 (.087)
Innovativeness	Partial η 2= .002	Partial η 2= .031	TCVS	M=5.198 (.089)
Perceived Enjoyment	F= .216; p= .643;	F= .253; p= .616;	360DCVS	M=5.001 (.102)
	Partial η 2= .001	Partial η 2= .001	TCVS	M=4.933 (.104)
Engagement Behavior	F=8.264; p= .005;	F=38.213; p= .000;	360DCVS	M=3.436 (.107)
	Partial η 2= .043	Partial η 2= .174	TCVS	M=3.879 (.109)
Brand Awareness	F= 1.079; p= .300;	F= .893; p= .346;	360DCVS	M=5.904 (.075)
	Partial η 2= .006	Partial η 2= .005	TCVS	M=5.792 (.076)
Customer Equity	F= 35.817; p= .000;	F= 15.736; p= .000;	360DCVS	M=3.883 (.128)
	Partial η 2= .164	Partial η 2= .080	TCVS	M=4.983 (.130)

Table 7: Justified Descriptive Statistics with Pairwise Comparison on Gender*VideoType

	VideoType	Male			Female		
	360DCVS	N=63 (34.0%)			N=31 (16.8%)		
	TCVS	N=46 (24.9%)			N=45 (24.3%)		
Dependent Variable		Mean	Std. Error	Sig.	Mean	Std. Error	Sig.
Perceived Innovativeness	360DCVS	5.090	.103	.007	5.237	.146	.025
	TCVS	5.529	.120		4.807	.121	
Perceived Enjoyment	360DCVS	5.122	.123	.140	4.774	.175	.294
	TCVS	4.841	.144		5.015	.145	
Engagement Behavior	360DCVS	3.603	.124	.000	3.335	.176	.182
	TCVS	4.592	.145		2.986	.146	
Brand Awareness	360DCVS	5.917	.091	.748	5.903	.130	.256
	TCVS	5.875	.107		5.689	.108	
Customer Equity	360DCVS	3.683	.127	.000	4.471	.181	.006
	TCVS	5.978	.148		3.840	.150	

5.5.3 *PreExperiences as the Covariate*

The normality test suggests the data have kurtosis in terms of EB (-1.048) and CE (-1.010) when participants select "Yes" for PreExperiences. The Wilk's Lambda Test reports a strong interaction (F (10, 354)=5.594, p= .000 < .10; Wilks' Λ = .746; partial η 2 = .136). The MANCOVA tests (Table 8) suggest BA (F (1, 182)=7.696, p= .006 < .025; partial η 2 = .041) is significant when controlling Type I error; resulting from a better mean score on 360DCVS (Mean=6.042; SE= .087) than TCVS (Mean=5.649; SE= .089). EB (F (1, 182)=2.886, p= .091 < .10; partial η 2 = .016) becomes significant when uses alpha value of .10. Justifying from the Estimates, 360DCVS (Mean=3.833; SE= .132) influence higher on EB than TCVS (Mean=3.469; SE= .135). However, as only three people had no prior experiences with TCVS; the comparison between PreExperiences equals "NO" should not be interpreted; thereby, denying the direct interpretation of the Estimates from Table 8.

Table 8: MANCOVA Results and Estimates: PreExperiences*VideoType

Dependent Variables	VideoType	Covariates: PreExperiences		Mean (Std. Error)
Perceived Innovativeness	F= .816; p= .368; Partial η 2= .004	F=2.685; p= .103; Partial η 2= .015	360DCVS TCVS	M= 5.230 (.104) M= 5.078 (.106)
Perceived Enjoyment	F= .029; p= .864; Partial η 2= .000	F= .750; p= .388; Partial η 2= .004	360DCVS TCVS	M= 4.951 (.120) M= 4.985 (.123)
Engagement Behavior	F=2.886; p= .091; Partial η 2= .016	F=20.077; p= .000; Partial η 2= .099	360DCVS TCVS	M=3.833 (.132) M=3.469 (.135)
Brand Awareness	F= 7.696; p= .006; Partial η 2= .041	F= .7.624; p= .006; Partial η 2= .040	360DCVS TCVS	M=6.042 (.087) M=5.649 (.089)
Customer Equity	F= 1.487; p= .224; Partial η 2= .008	F= 17.027; p= .000; Partial η 2= .086	360DCVS TCVS	M=4.277 (.150) M=4.575 (.154)

The findings interpret the result of PreExperiences equal "YES" after splitting the data. Table 9 indicates PreExperiences influences on the EB, resulting in people who had experiences with 360DCVS (Mean=4.375; SE= .201) are more likely to perform positive engagement behavior than people who had experiences with TCVS (Mean=3.779; SE= .117). Meanwhile, in terms of BA, 360DCVS (Mean=6.208; SE= .128) observes more values than TCVS (Mean=5.790; SE= .075). Hence, an ordinal interaction is tackled; the hypothesis 3 and 4 is supported when interfered by PreExperiences equals "YES".

However, although such outcomes shed light on the effectiveness of 360-degree commercials, the findings are not as insightful as expected. First, the data are kurtotic when examine EB. Second, BA's Cronbach's alpha value (.660) was below the cut off point .70. Lastly, the sample sizes among cells are unequal (16.2% vs 34.6%). Therefore, this MANCOVA results cannot be confidently interpreted.

Table 9: Justified Descriptive Statistics with Pairwise Comparison on PreExperiences*VideoType

	VideoType	Yes			No		
	360DCVS	N=30 (16.2%)			N=64 (34.6%)		
	TCVS	N=88 (47.6%)			N=3 (1.6%)		
Dependent Variable		Mean	Std. Error	Sig.	Mean	Std. Error	Sig.
Perceived Innovativeness	360DCVS	5.356	.153	.308	5.036	.108	.884
	TCVS	5.174	.089		5.111	.500	
Perceived Enjoyment	360DCVS	4.811	.187	.532	5.099	.110	.147
	TCVS	4.947	.109		4.333	.509	
Engagement Behavior	360DCVS	4.375	.201	.010	3.111	.120	.010
	TCVS	3.770	.117		4.625	.555	
Brand Awareness	360DCVS	6.208	.128	.005	5.773	.092	.663
	TCVS	5.790	.075		5.583	.424	
Customer Equity	360DCVS	4.640	.227	.223	3.616	.152	.870
	TCVS	4.961	.132		3.733	.701	

5.6 Hypotheses Testing Decisions

Overall, little had been discovered from MANOVA results in terms of the relationship between types of video and five factors. Hence, the hypotheses testing decisions are made according to the MANCOVA results. As the outcomes differed across covariates, Table 10 summarizes the overall decisions under Henseler's (2016) guide.

Table 10: Summary of Hypotheses Testing based on MANCOVA

	Covariates				
	Age	Gender			PreExperiences
		Male	Female	Overall	Yes
H1: PI	NS	R**	S**	NS	NS
H2: PE	NS	NS	NS	NS	NS
H3: EB	NS	R***	NS	R**	S*
H4: BA	NS	NS	NS	NS	S**
H5: CE	R***	R***	S**	R***	NS

Note: NS=Not Significant; R=Rejected; S=Support

* p-value ≤.10; ** p-value ≤ .05; *** p-value ≤ .001

6. Discussions

In the sense of YouTube and Facebook have pioneered the emerging of 360-degree video, as well as the dedications of tech giants such as Google, Apple and Samsung on VR business, many multinationals take advantage of 360-degree commercial campaigns as advertising vehicles to respond marketing disruption. This study urges to find out the potential values of 360-degree commercial campaigns, proposing to exam its effectiveness in relation to the perceived innovativeness, perceived enjoyment, engagement behavior, brand awareness and customer equity. Cheerlessly, the results do not shed lights on leveraging 360-degree commercials, at least for car companies, are no better than traditional commercials.

The results reveal that leveraging 360-degree commercials for automotive companies, indeed, have some influence on customer-brand engagement and customer-based brand equity when comparing with traditional commercials, albeit in the unexpected direction. Consistent with the proposed hypotheses model, the 360-degree commercials do not generate more customer-brand engagement and customer-based brand equity when compare with traditional commercials. This result contradicts to Scholz and Smith's (2016) theoretical reviews regarding the roles of immersive experiences maximize the customer engagement.

For measuring customer-brand engagement, overall, perceived innovativeness have no direct influence on types of commercials video. However, when gender as the covariate, the MANCOVA result tackles statistical differences. Specifically, the impact of perceived innovativeness on female group from 360DCVS scenario is superior to that of TCVS; while males state otherwise. It indicates that by leveraging 360-degree commercials, females can receive greater innovativeness than males. In terms of perceived enjoyment, the finding is rather astonishing. Perceived enjoyment has no influence on both commercial scenarios, even after controlling any of the covariates. This result contradicts to multitude technology models (e.g. technology acceptance model proposed by van der Heijden, 2003; Parise et al, 2016) and engagement models (e.g. Mollen & Wilson, 2010) that adopted Flow theories; as well as the virtual environment research (e.g. Nah et al, 2011; Visinescu et al, 2015). Nonetheless, although the results did not appear to be statistically significant between types of commercial and consumers' perceived values; both mean values verified a higher level of perceived innovativeness and perceived enjoyment regardless of the types of video solutions. Hence, it can be concluded that 360-degree commercial generates higher perceived innovativeness and perceived enjoyment, with females perceived higher innovativeness from 360-degree commercial than their counterparts; though the effectiveness in terms of perceived innovativeness and perceived enjoyment of 360-degree commercial are overall indifferent than the traditional commercial video. One possible explanation is that users perceived cognitive value and experiential value is based on the commercial content rather than types of video. From a physiological perspective, previous research in tradition commercial context confirms that the introduction of high arousal stimuli such as vividness of the commercial contents alters consumers' feels, which are reflected by the degree of energization, activation and inner tension (Balanche, Flavian & Perez-Rueda, 2017). This finding indicates that the types of video together with vivid video content are all important to trigger consumers'

perceived innovativeness and perceived enjoyment.

In terms of positive engagement behavior, the results find differences between female and male responses. The intention for male responses to perform positive engagement behavior is strongly influenced by types of video; yet an insignificant effect on females. In particular, the male group is more likely to perform positive engagement behavior on TCVS and unlikely to perform when watching 360DCVS; whereby females from both scenario are unlikely to perform positive engagement behavior. PreExperiences as the covariate also signifies the significant impact on engagement behavior. Respondents who have pre-usage behavior of 360DCVS report higher intention to perform engagement behavior than TCVS. Despite the biased results from PreExperiences as covariate, it is concluded the types of video do affect the engagement behaviors; however, both scenarios did not verify the possibilities to generalize more positive engagement behavior, when speaking of mean value.

For customer-based brand equity, the results in terms of brand awareness tackle the significance when respondents had pre-usage behavior that congruent with their assigned video type. Specifically, when users have been experienced with 360-degree video, brand awareness is higher than the users who have experienced with traditional type; although the general brand awareness for both scenarios are rather high. The explanation for this finding is mainly because respondents had pre-knowledge about brand *per se*, and 360-degree commercials can further strengthen consumers' recognition on brand node. Therefore, it can be concluded that 360-degree commercials help to strengthen the consumers' brand node, which enables to generalize higher brand awareness than traditional commercials. Yet, brand awareness is realized highly among all results in terms of the mean and achieves an unsatisfactory reliability test; in line with inadequate sample size among PreExperiences results; this conclusion is agitated.

Customer equity observes the most controversy results from this study. Contrary to the expectations, although both scenarios influence on customer equity, 360DCVS are unlikely to improve customer equity in general. This outcome partially consists with Townsend et al's (2012) that advertising influences consumers' "intended loyalty" but it is not marginally significant between European auto brands and consumers' intended loyalty. Meanwhile, resembling from Nah et al's (2011) outcomes: the 3D environment negatively associates with customer-based brand equity. This conclusion can be further validated by the covariates. When controlling age group, older consumers are unlikely to perform customer equity after watching 360DCVS; whereby very likely to enhance their customer equity after watching TCVS. Meanwhile, an excessive decreasing value has been observed between 360DCVS verses TCVS from older generation. When controlling gender group, males from TCVS tend to perform much higher customer equity than females; whilst much lower from 360DCVS. Females from 360DCVS group are more likely to act on customer equity. Hence, the degree to which 360DCVS generate customer equity is contradictory based on the different control groups and 360DCVS does not help to improve customer equity when compares mean.

Despite the findings above, another noteworthy result suggests the target group matters, when evaluating the mean values. A general tendency after controlling age group is observed in terms of the older the respondents; the fewer values have been generated from the 360-degree commercials across the five constructs. Most likely, as older consumers do not

advance evenly or unfamiliar with in navigating new technologies when compared with younger consumers (Visinescu et al, 2015), which affects their overall engagement experience and subsequently decrease their preference for the brand. In addition, the gender pairwise results find leveraging 360-degree commercials may not outperform than traditional commercials for males. Denoting theories from the "product-gender congruence", the cause could be due to the introduce product in the experiment commercials: an SUV. Consumers have the tendency to anthropomorphize the products and characterized gender information into the product (Fugate & Phillips, 2010), such as the motorcycle is perceived as a highly masculine product or the solarium is a highly feminine product (Beldad, Hegner & Hoppen, 2016). People attach to products with a product personality that matches their self-image (Govers & Schoormans, 2005); men tend to be more acknowledged and more critical on a highly stereotyped masculine product like SUV. Consequently, males prefer to find more functionalized information in the traditional commercials instead of being disturbed by the idea to seek information in the virtual world. In this recognition, men attach to traditional functionalize types of commercials (e.g. TCVS) more than innovative types of commercials (e.g. 360DCVS) when product genders are highly masculine, though it remains unknown.

7. Limitations and Future Research

Several limitations need to be discussed in this paper. The first limitation is related to the nature of this study. As one of the first studies to investigate the effectiveness of leveraging 360-degree commercial campaigns, the experiment subjects used existing commercials for operationalization. Although both scenarios consider content likewise, it is not able to fully control for all characteristics of the commercial *per se*. Thus, future research can replicate the results of this study within a controlled experiment, and ideally to exam the same contents with different video types.

The second limitation should be addressed from the experimental subjects. The study employed the random samples and utilized a well-known automobile brand as the experimental subject, resulting in more narrowed practical implications for unwell-known brands. The results might systematically show otherwise when focusing on customers who have no prior knowledge about a company. Several research themes can thus be suggested. For instance, future research can replicate the hypotheses testing model of this paper and adopt an unwell-known brand to testify the potential value of 360-degree commercial campaigns (e.g. BYD). It is also perceptive to compare well-known brands and unwell-known brands that operationalize in the same disciplines and target the same consumer groups (e.g BYD vs Volkswagen). In addition, a neutral product introduction in another industry that utilizes 360-degree commercial campaigns, such as smartphones or furniture, can be also insightful.

Lastly, the study employs perceived innovativeness, perceived enjoyment as dimensions of engagement. Future research can enrich more constructs that adopt technology innovation models, such as perceived usefulness or perceived ease of use to examine the capabilities of 360-degree video, and re-evaluate the engagement process.

8. Conclusions

This paper investigates the effectiveness of the 360-degree commercial campaigns for an auto company that includes consumers' engagement experience regarding perceived innovativeness, perceived enjoyment and engagement behavior; as well as consumers' perceptions in terms of brand awareness and customer equity. The findings suggest the extent to which 360-degree commercial campaigns generate customer-brand engagement and customer-based brand equity for auto companies are non significant on perceived enjoyment and brand awareness, do not outperform in terms of engagement behaviors and customer equity, and contradictory on perceived innovativeness and customer equity when controlling gender. Although much research theoretically supports views that virtual technologies such as augmented reality (e.g. Choi et al, 2016; Scholz & Smith, 2016) and virtual reality (e.g. Fox et al, 2009) can effectively boost the marketing performance; this paper does not find more positive impact on 360-degree commercial campaigns in comparison with the traditional commercial video. The results also indicate consumers perceive high innovativeness, enjoyment and brand awareness from both scenarios; however, they are unlikely to perform positive engagement behavior, and counteract on customer equity according to consumers' characteristics. Perhaps, a congruous with previous studies exists regarding immersion technologies might not always be practical (e.g. Nah et al, 2011; Visinescu et al, 2015).

This paper theoretically and empirically contributes to the 360-degree commercials evaluations and measurements, since it is one of the first studies to examine the impact of this type of commercials. Theories extend merely from existing advertising research but it duplicates from traditional advertising research and builds a bridge between 360-degree commercials and their impact on engagement and customer-based brand equity theories. This paper also sorts out the types of VR-related marketing campaigns to date, enhancing the general understanding in terms of the current marketing adoption of this technology and current marketing proposition in an online context.

Altering from the findings, perhaps, the most important implication for marketers is to judge the potential values of a new technology before interpreting them into marketing campaigns. A more in-depth result claims that target group matters when leveraging 360-degree commercial campaigns, particularly for the luxury automobile industry. So to answer "Should company leveraging 360-degree commercial campaigns?" The research findings tend to say "not necessary" for the auto industry since the returns might be less delightful than the traditional commercials. However, if the objective to leverage a commercial is to aim at engaging consumers psychologically such as perceived innovativeness and perceived enjoyment, 360-degree commercials can be an exceptional alternative to invest. If an auto company tries to deliver an innovative commercial to introduce a new auto that targets elders or males, 360-degree commercials shall be excused from. From a broader managerial standpoint, an indication emerging from this study is that practitioners shall not abruptly pursue some seemly innovative marketing trends to respond marketing disruption as it might counteract to their initial wishes. Instead, prudently creating a measurable matrix beforehand to assess whether they can generate higher impacts on their products or brands will be more adequate.

References

Aaker, D. A. (1991). *Managing brand equity: Capitalizing on the value of a brand name*. New York, NY: Free Press.

Agarwal, R., & Karahanna, E. (2000). Time Flies When You're Having Fun: Cognitive Absorption and Beliefs about Information Technology Usage. *MIS Quarterly*, *24*(4), 665. doi:10.2307/3250951

ANA. (2014, October 16). ANA Survey Results Identify Five Marketing Blind Spots | About the ANA | ANA. Retrieved from https://www.ana.net/content/show/id/32226

Belanche, D., Flavián, C., & Pérez-Rueda, A. (2017). Understanding Interactive Online Advertising: Congruence and Product Involvement in Highly and Lowly Arousing, Skippable Video Ads. *Journal of Interactive Marketing*, *37*, 75-88. doi:10.1016/j.intmar.2016.06.004

Beldad, A., Hegner, S., & Hoppen, J. (2016). The effect of virtual sales agent (VSA) gender – product gender congruence on product advice credibility, trust in VSA and online vendor, and purchase intention. *Computers in Human Behavior*, *60*, 62-72. doi:10.1016/j.chb.2016.02.046

Bibiloni, A., Ramis, S., Oliver, A., & Perales, F. J. (2016). An Augmented Reality and 360-degree Video System to Access Audiovisual Content through Mobile Devices for Touristic Applications. *Communications in Computer and Information Science*, 44-58. doi:10.1007/978-3-319-38907-3_5

Blattberg, R. C., & Deighton, J. (2010). Manage Marketing by the Customer Equity Test. *Perspectives on Promotion and Database Marketing*, 205-213. doi:10.1142/9789814287067_0013

Boyle, E. (2007). A process model of brand cocreation: brand management and research implications. *Journal of Product & Brand Management*, *16*(2), 122-131. doi:10.1108/10610420710739991

Brodie, R. J., Hollebeek, L. D., Juric, B., & Ilic, A. (2011). Customer Engagement: Conceptual Domain, Fundamental Propositions, and Implications for Research. *Journal of Service Research*, *14*(3), 252-271. doi:10.1177/1094670511411703

Brodie, R. J., Ilic, A., Juric, B., & Hollebeek, L. (2013). Consumer engagement in a virtual brand community: An exploratory analysis. *Journal of Business Research*, *66*(1), 105-114. doi:10.1016/j.jbusres.2011.07.029

Bruhn, M., Schoenmueller, V., & Schäfer, D. B. (2012). Are social media replacing traditional media in terms of brand equity creation? *Management Research Review*, *35*(9), 770-790. doi:10.1108/01409171211255948

Calder, B. J., & Malthouse, E. C. (2008). Media Engagement and Advertising Effectiveness. *Kellogg on Advertising & Media*, 1-36. doi:10.1002/9781119198154.ch1

Calder, B. J., Malthouse, E. C., & Schaedel, U. (2009). An Experimental Study of the Relationship between Online Engagement and Advertising Effectiveness. *Journal of Interactive Marketing*, *23*(4), 321-331. doi:10.1016/j.intmar.2009.07.002

Calder, B. J., & Malthouse, E. C. (2015). Media Engagement and Advertising Effectiveness. *Kellogg on Advertising & Media*, 1-36. doi:10.1002/9781119198154.ch1

Cambra-Fierro, J. J., Melero-Polo, I., & Vázquez-Carrasco, R. (2013). Customer engagement: Innovation in non-technical marketing processes. *Innovation*, *15*(3), 326-336. doi:10.5172/impp.2013.15.3.326

Choi, H., Lim, S., & Jeong, C. (2016). New promotional video technique utilizing augmented reality and popcode. *Multimedia Tools and Applications*, *75*(23), 15311–15326. doi:10.1007/s11042-014-2272-z

Chu, C. P., Dani, T. H., & Gadh, R. (1997). Multi-sensory user interface for a virtual-reality-based computeraided design system. *Computer-Aided Design*, *29*(10), 709-725. doi:10.1016/s0010-4485(97)00021-3

Constantinides, E. (2014). Foundations of Social Media Marketing. *Procedia - Social and Behavioral Sciences*, *148*, 40-57.

Csikszentmihalyi, M. (1997). *Finding flow: The psychology of engagement with everyday life* (1st ed.). New York, NY: Basic Books.

Dehghani, M., Niaki, M. K., Ramezani, I., & Sali, R. (2016). Evaluating the influence of YouTube advertising for attraction of young customers. *Computers in Human Behavior*, *59*, 165-172. doi:10.1016/j.chb.2016.01.037

Fayrence, C. Y., & Lee, G. C. (2010). Customer-based brand equity: a literature review. *Researchers World*, *2*(1), 33-42.

Fox, J., Arena, D., & Bailenson, J. N. (2009). Virtual Reality. *Journal of Media Psychology*, *21*(3), 95-113. doi:10.1027/1864-1105.21.3.95

Fugate, D. L., & Phillips, J. (2010). Product gender perceptions and antecedents of product gender congruence. *Journal of Consumer Marketing*, *27*(3), 251-261. doi:10.1108/07363761011038329

Godey, B., Manthiou, A., Pederzoli, D., Rokka, J., Aiello, G., Donvito, R., & Singh, R. (2016). Social media marketing efforts of luxury brands: Influence on brand equity and consumer behavior. *Journal of Business Research*, *69*(12), 5833-5841. doi:10.1016/j.jbusres.2016.04.181

Govers, P., & Schoormans, J. (2005). Product personality and its influence on consumer preference. *Journal of Consumer Marketing*, *22*(4), 189-197. doi:10.1108/07363760510605308

Hayes, J. L., King, K. W., & Ramirez, A. (2016). Brands, Friends, & Viral Advertising: A Social Exchange Perspective on the Ad Referral Processes. *Journal of Interactive Marketing*, *36*, 31-45. doi:10.1016/j.intmar.2016.04.001

Henseler, J. (2016, May). *Analysis of Variance: Technic Lecture* [PowerPoint slides]. Retrieved from https://blackboard.utwente.nl/bbcswebdav/pid-945873-dt-content-rid-2080939_2/courses/2015-201500082-2B/08_TL_Analysis_of_Variance.pdf

Hollebeek, L. D. (2011). Demystifying customer brand engagement: Exploring the loyalty nexus. *Journal of Marketing Management*, *27*(7-8), 785-807. doi:10.1080/0267257x.2010.500132

Kamakura, W. A., & Russell, G. J. (1991). *Measuring consumer perceptions of brand quality with scanner data: Implications for brand equity*. Cambridge, MA: Marketing Science Institute.

Kaplan, M. D. (2009). The relationship between perceived innovativeness and emotional product responses: a brand oriented approach. *Innovative Marketing*, *5*(1), 39-47.

Keller, K. L. (1993). Conceptualizing, Measuring, and Managing Customer-Based Brand Equity. *Journal of Marketing*, *57*(1), 1. doi:10.2307/1252054

Keller, K. L. (2001). Building customer-based brand equity: A blueprint for creating strong brands. *Marketing Science Institute: Cambridge, USA*.

Khan, M. L. (2017). Social media engagement: What motivates user participation and consumption on YouTube? *Computers in Human Behavior*, *66*, 236-247. doi:10.1016/j.chb.2016.09.024

Kim, Y., Son, Y., & Han, S. (2016). What is the Role of TV Commercials in the Trans-Media Era? *Indian Journal of Science and Technology*, *9*(41), 1-10. doi:10.17485/ijst/2016/v9i41/103846

Kirmani, A., & Zeithaml, V. (1993). *Advertising, perceived quality, and brand image (pp. 143-62)*. Hillsdale, NJ: Lawrence Erlbaum Associates.

Ko, H., Cho, C., & Roberts, M. S. (2005). Internet uses and gratifications: A structural equation model of interactive advertising. *Journal of Advertising*, *34*(2), 57-70. doi:10.1080/00913367.2005.10639191

Koufaris, M. (2002). Applying the Technology Acceptance Model and Flow Theory to Online Consumer Behavior. *Information Systems Research*, *13*(2), 205-223. doi:10.1287/isre.13.2.205.83

Kozinets, R. V., De Valck, K., Wojnicki, A. C., & Wilner, S. J. (2010). Networked Narratives: Understanding Word-of-Mouth Marketing in Online Communities. *Journal of Marketing*, *74*(2), 71-89. doi:10.1509/jmkg.74.2.71

Kuvykaite, R., & Piligrimiene, Z. (2014). Consumer Engagement into Brand Equity Creation. *Procedia - Social and Behavioral Sciences*, *156*, 479-483. doi:10.1016/j.sbspro.2014.11.225

Kuvykaitė, R., & Tarutė, A. (2015). A Critical Analysis of Consumer Engagement Dimensionality. *Procedia - Social and Behavioral Sciences*, *213*, 654-658. doi:10.1016/j.sbspro.2015.11.468

Lee, J., & Lee, M. (2011). Factors Influencing the Intention to Watch Online Video Advertising. *Cyberpsychology, Behavior, and Social Networking*, *14*(10), 619-624. doi:10.1089/cyber.2009.0305

Leone, R. P., Rao, V. R., Keller, K. L., Luo, A. M., McAlister, L., & Srivastava, R. (2006). Linking Brand Equity to Customer Equity. *Journal of Service Research*, *9*(2), 125 - 138. doi:10.1177/1094670506293563

Liang, T., & Turban, E. (2011). Introduction to the Special Issue Social Commerce: A Research Framework for Social Commerce. *International Journal of Electronic Commerce*, *16*(2), 5-14. doi:10.2753/jec1086-4415160201

Matsuno, K., Zhu, Z., & Rice, M. P. (2014). Innovation Process and Outcomes for Large Japanese Firms: Roles of Entrepreneurial Proclivity and Customer Equity. *Journal of Product Innovation Management*, *31*(5), 1106-1124. doi:10.1111/jpim.12147

McKinsey. (2009, June). The consumer decision journey | McKinsey & Company. Retrieved from

http://www.mckinsey.com/business-functions/marketing-and-sales/our-insights/the-consumer-decision-journey

Mollen, A., & Wilson, H. (2010). Engagement, telepresence and interactivity in online consumer experience: Reconciling scholastic and managerial perspectives. *Journal of Business Research*, *63*(9-10), 919-925. doi:10.1016/j.jbusres.2009.05.014

Nah, F. F., Eschenbrenner, B., & DeWester, D. (2011). Enhancing Brand Equity Through Flow and Telepresence: A Comparison of 2D and 3D Virtual Worlds. *MIS Quarterly*, *35*(3), 731-747.

Nikabadi, M. S., Safui, M. A., & Agheshlouei, H. (2015). Role of Advertising and Promotion in Brand Equity Creation. *Journal of Promotion Management*, *21*(1), 13-32. doi:10.1080/10496491.2014.946208

Parise, S., Guinan, P. J., & Kafka, R. (2016). Solving the crisis of immediacy: How digital technology can transform the customer experience. *Business Horizons*, *59*(4), 411-420. doi:10.1016/j.bushor.2016.03.004

Raney, A. A., Arpan, L. M., Pashupati, K., & Brill, D. A. (2003). At the movies, on the Web: An investigation of the effects of entertaining and interactive Web content on site and brand evaluations. *Journal of Interactive Marketing*, *17*(4), 38-53. doi:10.1002/dir.10064

Rogers, E. M. (1983). *Diffusion of innovations* (3rd ed.). New York: Free Press.

Rust, R. T., Lemon, K. N., & Zeithaml, V. A. (2004). Return on Marketing: Using Customer Equity to Focus Marketing Strategy. *Journal of Marketing*, *68*(1), 109-127. doi:10.1509/jmkg.68.1.109.24030

Scholz, J., & Smith, A. N. (2016). Augmented reality: Designing immersive experiences that maximize consumer engagement. *Business Horizons*, *59*(2), 149-161. doi:10.1016/j.bushor.2015.10.003

Schumpeter, J. A. (1961). *The theory of economic development : an inquiry into profits, capital, credit, interest, and the business cycle*. Oxford University Press.

Shao, G. (2009). Understanding the appeal of user-generated media: a uses and gratification perspective. *Internet Research*, *19*(1), 7-25. doi:10.1108/10662240910927795

Townsend, J. D., Cavusgil, S. T., & Calantone, R. J. (2012). Building Market-Based Assets in a Globally Competitive Market: A Longitudinal Study of Automotive Brands. *Advances in International Marketing*, 3-37. doi:10.1108/s1474-7979(2012)0000023005

Van der Heijden, H. (2003). Factors influencing the usage of websites: the case of a generic portal in The Netherlands. *Information & Management*, *40*(6), 541-549. doi:10.1016/s0378-7206(02)00079-4

Van Doorn, J., Lemon, K. N., Mittal, V., Nass, S., Pick, D., Pirner, P., & Verhoef, P. C. (2010). Customer Engagement Behavior: Theoretical Foundations and Research Directions. *Journal of Service Research*, *13*(3), 253-266. doi:10.1177/1094670510375599

Visinescu, L. L., Sidorova, A., Jones, M. C., & Prybutok, V. R. (2015). The influence of website dimensionality on customer experiences, perceptions and behavioral

intentions: An exploration of 2D vs. 3D web design. *Information & Management*, *52*(1), 1-17. doi:10.1016/j.im.2014.10.005

Wijnants, M., Van Erum, K., Quax, P., & Lamotte, W. (2016). Augmented ODV: Web-Driven Annotation and Interactivity Enhancement of 360 Degree Video in Both 2D and 3D. *Lecture Notes in Business Information Processing*, 47-69. doi:10.1007/978-3-319-30996-5_3

Yoo, B., Donthu, N., & Lee, S. (2000). An Examination of Selected Marketing Mix Elements and Brand Equity. *Journal of the Academy of Marketing Science*, *28*(2), 195-211. doi:10.1177/0092070300282002

Zhang, H., Liang, X., & Wang, S. (2016). Customer value anticipation, product innovativeness, and customer lifetime value: The moderating role of advertising strategy. *Journal of Business Research*, *69*(9), 3725-3730. doi:10.1016/j.jbusres.2015.09.018

Appendices

Appendix A: Questionnaires Design

Appendix A-1 and Appendix A-2 presents the overall design of the questionnaires respectfully. Whilst the measurement scales are the same, the distinctions between questionnaires were the inserted video (link provided) as well as the way of asking their pre-experiences of watching the different types of video solution (question 4 listed in demographic information). The links of questionnaires are also provided for inspection.

Table A-1: Group A's Questionnaire

Title	Mercedes-Benz Loki Campaign (A)
Inserted Video	360DCVS: https://www.youtube.com/watch?v=vVNylwQRUQM
Demographic Information	1. Gender ○ Male ○ Female ○ Prefer not to say 2. Age _____ 3. Have you watch this commercial before? ○ Yes ○ No ○ Prefer not to say 4. Do you have experiences of watching 360-degree commercial video in general? ○ Yes ○ No ○ Prefer not to say 5. Do you know the brand "Mercedes-Benz" before watching this video? ○ Yes ○ No ○ Prefer not to say
Measurement Scales	Please rate your level of agreement toward sentences: 1 = entirely disagree; 2 = mostly disagree; 3 = somewhat disagree; 4 = neutral (neither disagree nor agree) 5 = somewhat agree; 6 = agree; 7 = entirely agree * Sentences are referring to Appendix B, Table B-1
Links of the questionnaire	https://goo.gl/forms/fW8FTCAIXzZm9lFS2

Table A-2: Group B's Questionnaire

Title	Mercedes-Benz Loki Campaign (B)
Inserted Video	TCVS: https://www.youtube.com/watch?v=arZVGwhfkoA
Demographic Information	1. Gender ○ Male ○ Female ○ Prefer not to say 2. Age _____ 3. Have you watch this commercial before? ○ Yes ○ No ○ Prefer not to say 4. Do you have experiences of watching commercial video in general? ○ Yes ○ No ○ Prefer not to say 5. Do you know the brand "Mercedes-Benz" before watching this video? ○ Yes ○ No ○ Prefer not to say
Measurement Scales	Please rate your level of agreement toward sentences: 1 = entirely disagree; 2 = mostly disagree; 3 = somewhat disagree; 4 = neutral (neither disagree nor agree) 5 = somewhat agree; 6 = agree; 7 = entirely agree * Sentences are referring to Appendix B, Table B-1
Links of the questionnaire	https://goo.gl/forms/UUm2cVPJRMq9WIlJ2

Appendix B: Measurement Scales Used

Table B-1: Measurement Scale and Sources

Measurement	Sources
Customer-brand Engagement (CBE)	
Perceived Innovativeness (PI)	Zhang et al (2016)
1. I think Mercedes has the ability to produce innovative commercials	
2. I think overall Mercedes is more creative than competitors	
3. I think Mercedes always try innovative things (e.g. technology, products, and/or commercial etc).	
Perceived enjoyment (PE)	Koufairs (2000); Nah et al (2011)
1. I feel entertained when watching this commercial	
2. I feel enjoy when watching this commercial	
3. It is interesting when watching this commercial	
Engagement Behaviors (EB)	Aaker (1991); Keller (1993); Yoo et al (2000); Shao (2009); Godey et al (2016). Khan (2017)
1. WOM: I'm likely to pass positive information to my friends / relatives / peers about this commercial	
2. WOM: If a friend would like to purchase a SUV, I'm likely to recommend him/her to check out the one showed in this commercial first	
3. WOM: I'm likely to talk about this commercial to my friends / relative / peers.	
4. eWOM: I'm likely to share this commercial through my social media to my friends / relatives /peers	Note: sentences 5, 6, 8 are self-reported
5. Active: I'm likely to follow Mercedes through my social media account after watching this commercial	
6. Active, I'm likely to hashtag (#), at (@), or engage other forms of activities with this commercial post through social media account if my post has the same features showed in the commercial (e.g. SUV, husky and/or Mercedes).	
7. Active: I'm likely to "comment", "share" or "like" this commercial post if it appears on my timelines.	
8. Passive: I'm likely to watch this commercial again	
Customer-based Brand Equity (CBBE)	
Brand Awareness (BA)	Aaker (1991); Keller (1993); Yoo et al (2000); Nah et al (2011); Godey et al (2016).
1. I can quickly recall the characteristics or features (e.g. type of business) of Mercedes	
2. I can quickly recall the symbol or logo of Mercedes	
3. When I think about (German) car, Mercedes will come into my mind	

4. I have no difficulties in imaging Mercedes in my mind.	
Customer Equity (CE) 1. Preference: Although other auto companies have almost the same characteristics or features of Mercedes, I would prefer to choose Mercedes 2. Preference: If another brand does not differ from Mercedes in terms of the price and service, it seems smarter to purchase from Mercedes 3. Preference: Although there is another brand as good as Mercedes, I prefer Mercedes 4. Loyalty: I am a fan of Mercedes brand 5. Loyalty: Mercedes would be my first consideration	Aaker (1991); Keller (1993); Yoo et al (2000); Nah et al (2011); Godey et al (2016).

Appendix C: Confirmatory Factor Analysis Statistics

Appendix C-1: Descriptive Statistics

Table C-1a: The Descriptive Statistics of Dependent Variables

	Aggregate Data			360DCVS		TCVS	
Items	Mean	Std. Deviation	Analysis N	Mean	Std. Deviation	Mean	Std. Deviation
PI1	5.76	.973	185	5.60	.987	5.92	.934
PI2	4.67	1.115	185	4.53	1.065	4.81	1.154
PI3	5.04	1.044	185	5.29	1.064	4.78	.964
PE1	4.91	1.208	185	4.95	1.265	4.88	1.153
PE2	5.19	1.106	185	5.09	1.123	5.31	1.082
PE3	4.79	1.161	185	4.99	1.187	4.59	1.105
EB1	4.94	1.299	185	4.80	1.151	5.09	1.427
EB2	3.85	1.459	185	3.60	1.347	4.11	1.531
EB3	4.01	1.264	185	4.03	1.274	3.99	1.260
EB4	3.19	1.565	185	3.49	1.631	2.88	1.436
EB5	3.08	1.576	185	2.84	1.512	3.32	1.612
EB6	3.01	1.629	185	2.72	1.636	3.31	1.575
EB7	3.69	1.838	185	3.54	1.853	3.85	1.819
EB8	3.46	1.668	185	3.10	1.517	3.85	1.738
BA1	5.31	1.107	185	5.31	1.279	5.31	.903
BA2	6.37	.770	185	6.41	.768	6.32	.773
BA3	5.85	1.163	185	5.93	1.194	5.78	1.133
BA4	5.86	1.036	185	6.00	.816	5.73	1.212
CE1	4.61	1.619	185	4.11	1.555	5.12	1.526
CE2	4.94	1.411	185	4.36	1.375	5.54	1.186
CE3	4.58	1.676	185	4.23	1.636	4.95	1.649
CE4	4.24	1.642	185	3.87	1.424	4.63	1.768
CE5	3.75	1.509	185	3.14	1.380	4.37	1.380

Note: PI: Perceived Innovativeness; PE: Perceived Enjoyment; EB: Engagement Behavior; BA=Brand Awareness; CE=Customer Equity.

Table C-1b: KMO and Bartlett's Test

Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		.841
Bartlett's Test of Sphericity	Approx. Chi-Square	2563.508
	df	253
	Sig.	.000

Appendix C-2: Factor loading

Table C-2a: Total Variance Explained

Component	Initial Eigenvalues			Rotation Sums of Squared Loadings		
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	7.724	33.584	33.584	4.957	21.553	21.553
2	2.952	12.834	46.418	3.600	15.654	37.207
3	2.096	9.111	55.529	2.683	11.665	48.872
4	1.628	7.078	62.608	2.204	9.583	58.454
5	1.227	5.336	67.944	2.183	9.489	67.944
6	.989	4.299	72.243			

Extraction Method: Principal Component Analysis.

Table C-2b: Component Correlation Matrix

Component	1	2	3	4	5
1	1.000	.011	.206	-.357	.298
2	.011	1.000	.102	-.213	.191
3	.206	.102	1.000	-.136	.006
4	-.357	-.213	-.136	1.000	-.260
5	.298	.191	.006	-.260	1.000

Extraction Method: Principal Component Analysis.

Rotation Method: Oblimin with Kaiser Normalization.

Table C-2c: Pattern Matrixa

	Component				
	1	2	3	4	5
CE5	.934	.019	-.099	.003	-.110
CE1	.860	-.068	.062	.021	.080
CE3	.843	.000	-.078	-.029	.144
CE4	.798	.002	.021	-.069	.042
CE2	.795	.039	.187	.079	.002
PE1	-.003	.844	.206	.127	-.059
PE2	.134	.842	-.031	.091	.105
PE3	-.231	.703	.002	-.230	.098
BA2	-.103	.018	.883	.031	-.058
BA3	.246	-.061	.617	.093	.300
BA1	-.038	.129	.616	-.231	-.190
BA4	.229	.336	.445	-.076	.110
EB4	-.103	-.126	.141	-.873	.124
EB3	-.151	.275	-.094	-.750	.036
EB6	.256	-.293	.090	-.640	.130

EB7	.342	-.024	.280	-.577	-.104
EB5	.448	-.194	.180	-.550	.110
EB1	.151	.397	-.135	-.506	.150
EB8	.466	.163	-.106	-.480	-.061
EB2	.204	.253	-.042	-.322	.149
PI1	-.146	.081	.131	.036	.799
PI3	.033	-.071	-.083	-.127	.792
PI2	.160	.096	-.169	-.033	.723

Extraction Method: Principal Component Analysis.

Rotation Method: Oblimin with Kaiser Normalization.

a. Rotation converged in 9 iterations.

Appendix C-3: Chronbach's Alpha Coefficient Reliability Test

Table C-3a: Reliability test for Factor One: Perceived innovativeness.

	Item-Total Statistics					Reliability Statistics		
	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Squared Multiple Correlation	Cronbach's Alpha if Item Deleted	Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items
PI1	9.71	3.653	.505	.257	.722			
PI2	10.79	2.892	.617	.387	.592	.740	.740	3
PI3	10.43	3.213	.581	.351	.637			

Table C-3b: Reliability test for Factor Two: Perceived Enjoyment.

	Item-Total Statistics					Reliability Statistics		
	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Squared Multiple Correlation	Cronbach's Alpha if Item Deleted	Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items
PE1	9.99	4.032	.640	.438	.725			
PE2	9.71	4.197	.702	.497	.662	.797	.798	3
PE3	10.11	4.401	.585	.352	.781			

Table C-3c: Reliability test for Factor Three: Engagement Behavior

	Item-Total Statistics					Reliability Statistics		
	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Squared Multiple Correlation	Cronbach's Alpha if Item Deleted	Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items
EB1	24.29	68.143	.614	.546	.868	.879	.879	8
EB2	25.38	69.542	.465	.345	.881			

EB3	25.22	69.695	.554	.518	.873
EB4	26.04	62.846	.713	.595	.856
EB5	26.16	61.329	.777	.713	.849
EB6	26.22	63.119	.665	.615	.862
EB7	25.54	59.652	.703	.579	.858
EB8	25.77	62.734	.661	.521	.862

Table C-3d: Reliability test for Factor Four: Brand Awareness

	Item-Total Statistics					Reliability Statistics		
	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Squared Multiple Correlation	Cronbach's Alpha if Item Deleted	Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items
BA1	18.09	5.297	.369	.223	.645			
BA2	17.03	5.787	.546	.319	.553	.660	.678	4
BA3	17.54	4.739	.456	.255	.585			
BA4	17.53	5.229	.443	.225	.590			

Table C-3e: Reliability test for Factor Five: Customer Equity

	Item-Total Statistics					Reliability Statistics		
	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Squared Multiple Correlation	Cronbach's Alpha if Item Deleted	Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items
CE1	17.51	29.588	.830	.732	.893			
CE2	17.18	32.941	.735	.580	.912	.919	.920	5
CE3	17.54	29.141	.822	.700	.895			
CE4	17.88	30.218	.771	.649	.905			
CE5	18.37	31.007	.806	.683	.898			

Appendix D: MANOVA Assumptions Statistics

Table D-1: Descriptive Statistics Between VideoType and Dependent Variables

	N	Mean	Std. Deviation	Skewness		Kurtosis	
				Statistic	SE	Statistic	SE
360DCVS	94						
PI		5.1383	.83874	-.028	.249	-.788	.493
PE		5.0071	1.01950	-.530	.249	-.219	.493
EB		3.5146	1.01084	-.027	.249	-.581	.493
BA		5.9122	.70778	-.331	.249	-.595	.493
CE		3.9426	1.20701	-.415	.249	-.095	.493
TCVS	91						
PI		5.1722	.86262	-.031	.253	-.435	.500
PE		4.9267	.93598	.079	.253	-.652	.500
EB		3.7981	1.24649	.002	.253	-.998	.500
BA		5.7830	.73994	-.513	.253	-.374	.500
CE		4.9209	1.35380	-.460	.253	-.913	.500

Table D-2: Tests of Normality (Shapiro-Wilk)

	Video type	Kolmogorov-Smirnov[a]			Shapiro-Wilk		
		Statistic	df	Sig.	Statistic	df	Sig.
PI	360DCVS	.103	94	.016	.964	94	.012
	TCVS	.107	91	.012	.972	91	.050
PE	360DCVS	.136	94	.000	.957	94	.003
	TCVS	.137	91	.000	.969	91	.030
EB	360DCVS	.046	94	.200*	.986	94	.422
	TCVS	.118	91	.003	.951	91	.002
BA	360DCVS	.134	94	.000	.951	94	.001
	TCVS	.132	91	.001	.957	91	.004
CE	360DCVS	.112	94	.006	.971	94	.036
	TCVS	.154	91	.000	.937	91	.000

*. This is a lower bound of the true significance.

a. Lilliefors Significance Correction

Table D-3: Box's Test of Equality of Covariance Matrices[a]

Box's M	19.373
F	1.254
df1	15
df2	134527.625
Sig.	.223

Tests the null hypothesis that the observed covariance matrices of the dependent variables are equal across groups.

a. Design: Intercept + VideoType

Table D-4: Levene's Test of Equality of Error Variances[a]

	F	df1	df2	Sig.
PI	.005	1	183	.945
PE	.182	1	183	.670
EB	6.839	1	183	.003
BA	.046	1	183	.830
CE	4.161	1	183	.043

Tests the null hypothesis that the error variance of the dependent variable is equal across groups.

a. Design: Intercept + VideoType

Appendix E: MANOVA Model Estimation and Model Fit

Table E-1: Wikls'Lambda Test for Assessing Statistical Significance

Multivariate Tests[a]

Effect		Value	F	Hypothesis df	Error df	Sig.	Partial Eta Squared	Noncent. Parameter	Observed Power[c]
VideoType	Pillai's Trace	.204	9.178[b]	5.000	179.000	.000	.204	45.890	1.000
	Wilks' Lambda	.796	9.178[b]	5.000	179.000	.000	.204	45.890	1.000
	Hotelling's Trace	.256	9.178[b]	5.000	179.000	.000	.204	45.890	1.000
	Roy's Largest Root	.256	9.178[b]	5.000	179.000	.000	.204	45.890	1.000

a. Design: Intercept + VideoType; b. Exact statistic; c. Computed using alpha = .10

Table E-2: Tests of Between-Subjects Effects

Source	Dependent Variable	Type III Sum of Squares	df	Mean Square	F	Sig.	Partial Eta Squared	Noncent. Parameter	Observed Power[f]
Intercept	PI	4915.340	1	4915.340	6794.177	.000	.974	6794.177	1.000
	PE	4562.797	1	4562.797	4757.602	.000	.963	4757.602	1.000
	EB	2472.598	1	2472.598	1926.591	.000	.913	1926.591	1.000
	BA	6324.306	1	6324.306	12072.746	.000	.985	12072.746	1.000
	CE	3632.465	1	3632.465	2212.557	.000	.924	2212.557	1.000
VideoType	PI	.053	1	.053	.073	.787	.000	.073	.112
	PE	.299	1	.299	.311	.578	.002	.311	.152
	EB	3.715	1	3.715	2.895	.091	.016	2.895	.520
	BA	.773	1	.773	1.475	.226	.008	1.475	.334
	CE	44.255	1	44.255	26.956	.000	.128	26.956	1.000
Error	PI	132.394	183	.723					
	PE	175.507	183	.959					

	EB	234.863	183	1.283
	BA	95.865	183	.524
	CE	300.440	183	1.642
	PI	5048.556	185	
	PE	4741.000	185	
Total	EB	2708.719	185	
	BA	6424.875	185	
	CE	3965.120	185	

a. R Squared = .000 (Adjusted R Squared = -.005); b. R Squared = .002 (Adjusted R Squared = -.004); c. R Squared = .016 (Adjusted R Squared = .010)
d. R Squared = .008 (Adjusted R Squared = .003); e. R Squared = .128 (Adjusted R Squared = .124); f. Computed using alpha = .10

Table E-3: Estimated Marginal Means

Dependent Variable	Video Type	Mean	Std. Error	95% Confidence Interval	
				Lower Bound	Upper Bound
PI	360DCVS	5.138	.088	4.965	5.311
	TCVS	5.172	.089	4.996	5.348
PE	360DCVS	5.007	.101	4.808	5.206
	TCVS	4.927	.103	4.724	5.129
EB	360DCVS	3.515	.117	3.284	3.745
	TCVS	3.798	.119	3.564	4.032
BA	360DCVS	5.912	.075	5.765	6.060
	TCVS	5.783	.076	5.633	5.933
CE	360DCVS	3.943	.132	3.682	4.203
	TCVS	4.921	.134	4.656	5.186

Appendix F: MANCOVA Analysis Statistics: Age as the Covariate

Table F-1: Descriptive Statistics of Age vs. VideoType

			VideoType		Total	Chi-square/T test
			360DCVS	TCVS		
AgeRe	1 (19-25)	Count	16	21	37	Chi-square = 6.766
		% of Total	8.6%	11.4%	20.0%	df=1
	2 (26-35)	Count	65	62	127	sig= .080
		% of Total	35.1%	33.5%	68.6%	
	3 (36-45)	Count	7	8	15	
		% of Total	3.8%	4.3%	8.1%	
	4 (Over 45)	Count	6	0	6	
		% of Total	3.2%	0.0%	3.2%	

Table F-2: Descriptive Statistics Between Age and Dependent Variables

	N	Mean	Std. Deviation	Skewness		Kurtosis	
				Statistic	SE	Statistic	SE
1 (19-25)	37						
PI		5.5586	.65760	-.139	.388	-.260	.759
PE		5.1622	.80746	.098	.388	-.059	.759
EB		3.9493	1.13248	.230	.388	.045	.759
BA		5.9932	.59362	.100	.388	-1.108	.759
CE		4.4919	1.28201	-.140	.388	-.481	.759
2 (26-35)	127						
PI		5.1260	.88285	-.003	.215	-.690	.427
PE		5.0026	.08948	-.429	.215	-.354	.427
EB		3.6417	1.15517	-.034	.215	-1.011	.427
BA		5.8091	.72543	-.431	.215	-.504	.427
CE		4.4409	1.38801	-.237	.215	-.752	.427
3 (36-45)	15						
PI		4.7333	.53748	-.137	.580	-.099	1.121
PE		4.5111	.90735	1.086	.580	1.128	1.121
EB		3.2417	.97453	.304	.580	-1.281	1.121
BA		5.8667	.78982	-.434	.580	-.851	1.121
CE		4.2267	1.71192	-.441	.580	-.476	1.121
4 (over 45)	6						
PI		4.3333	.59628	.000	.845	-1.875	1.741
PE		4.1667	.91287	.876	.845	-1.840	1.741
EB		3.1250	.83666	-.846	.845	-1.807	1.741
BA		5.7500	1.25499	-.512	.845	-1.534	1.741
CE		4.1333	.30111	-.215	.845	-2.829	1.741

Table F-3: Tests of Normality (Shapiro-Wilk)

	AgeRe	Kolmogorov-Smirnov[a]			Shapiro-Wilk		
		Statistic	df	Sig.	Statistic	df	Sig.
PI	1.00	.133	37	.097	.969	37	.373
	2.00	.097	127	.005	.971	127	.008
	3.00	.216	15	.058	.943	15	.425
	4.00	.202	6	.200*	.853	6	.167
PE	1.00	.109	37	.200*	.978	37	.654
	2.00	.101	127	.003	.966	127	.003
	3.00	.165	15	.200*	.908	15	.125
	4.00	.375	6	.009	.738	6	.015
EB	1.00	.113	37	.200*	.957	37	.158
	2.00	.077	127	.062	.970	127	.006
	3.00	.137	15	.200*	.914	15	.153
	4.00	.340	6	.029	.789	6	.047
BA	1.00	.142	37	.057	.939	37	.042
	2.00	.147	127	.000	.955	127	.000
	3.00	.255	15	.009	.882	15	.051
	4.00	.246	6	.200*	.879	6	.264
CE	1.00	.086	37	.200*	.978	37	.671
	2.00	.082	127	.037	.970	127	.007
	3.00	.098	15	.200*	.953	15	.579
	4.00	.312	6	.069	.767	6	.029

Table F-4: Box's Test of Equality of Covariance Matrices[a]

Box's M	19.373
F	1.254
df1	15
df2	134527.625
Sig.	.223

Tests the null hypothesis that the observed covariance matrices of the dependent variables are equal across groups. a. Design: Intercept + VieoType + AgeRe + VideoType * AgeRe

Table F-5: Levene's Test of Equality of Error Variances[a]

	F	df1	df2	Sig.
PI	.022	1	183	.968
PE	.344	1	183	.558
EB	13.374	1	183	.000
BA	.081	1	183	.776
CE	4.150	1	183	.043

Tests the null hypothesis that the error variance of the dependent variable is equal across groups. a. Design: Intercept + VieoType + AgeRe + VideoType * AgeRe

Table F-6: Wilks'Lambda Test for Assessing Statistical Significance

Multivariate Tests[a]

Effect		Value	F	Hypothesis df	Error df	Sig.	Partial Eta Squared	Noncent. Parameter	Observed Power[c]
Intercept	Pillai's Trace	.922	420.202[b]	5.000	177.000	.000	.922	2101.011	1.000
	Wilks' Lambda	.078	420.202[b]	5.000	177.000	.000	.922	2101.011	1.000
	Hotelling's Trace	11.870	420.202[b]	5.000	177.000	.000	.922	2101.011	1.000
	Roy's Largest Root	11.870	420.202[b]	5.000	177.000	.000	.922	2101.011	1.000
VideoType	Pillai's Trace	.014	.511[b]	5.000	177.000	.767	.014	2.557	.292
	Wilks' Lambda	.986	.511[b]	5.000	177.000	.767	.014	2.557	.292
	Hotelling's Trace	.014	.511[b]	5.000	177.000	.767	.014	2.557	.292
	Roy's Largest Root	.014	.511[b]	5.000	177.000	.767	.014	2.557	.292
AgeRe	Pillai's Trace	.134	5.463[b]	5.000	177.000	.000	.134	27.314	.996
	Wilks' Lambda	.866	5.463[b]	5.000	177.000	.000	.134	27.314	.996
	Hotelling's Trace	.154	5.463[b]	5.000	177.000	.000	.134	27.314	.996
	Roy's Largest Root	.154	5.463[b]	5.000	177.000	.000	.134	27.314	.996
VideoType * AgeRe	Pillai's Trace	.026	.937[b]	5.000	177.000	.458	.026	4.685	.457
	Wilks' Lambda	.974	.937[b]	5.000	177.000	.458	.026	4.685	.457
	Hotelling's Trace	.026	.937[b]	5.000	177.000	.458	.026	4.685	.457
	Roy's Largest Root	.026	.937[b]	5.000	177.000	.458	.026	4.685	.457

a. Design: Intercept + VideoType + AgeRe + VideoType * AgeRe

b. Exact statistic

c. Computed using alpha = .10

Table F-7: Tests of Between-Subjects Effects

Source	Dependent Variable	Type III Sum of Squares	df	Mean Square	F	Sig.	Partial Eta Squared	Noncent. Parameter	Observed Power[f]
Corrected Model	PI	12.901[a]	2	6.450	9.820	.000	.097	19.640	.992
	PE	8.278[b]	2	4.139	4.496	.012	.047	8.993	.850
	EB	9.767[c]	2	4.883	3.884	.022	.041	7.769	.798
	BA	1.494[d]	2	.747	1.429	.242	.015	2.858	.425
	CE	44.270[e]	2	22.135	13.410	.000	.128	26.819	.999
Intercept	PI	630.116	1	630.116	959.303	.000	.841	959.303	1.000
	PE	556.363	1	556.363	604.425	.000	.769	604.425	1.000
	EB	314.196	1	314.196	249.917	.000	.579	249.917	1.000
	BA	645.914	1	645.914	1235.573	.000	.872	1235.573	1.000
	CE	352.155	1	352.155	213.338	.000	.540	213.338	1.000
AgeRe	PI	12.847	1	12.847	19.559	.000	.097	19.559	.997
	PE	7.979	1	7.979	8.668	.004	.045	8.668	.901
	EB	6.052	1	6.052	4.814	.030	.026	4.814	.706
	BA	.721	1	.721	1.380	.242	.008	1.380	.320
	CE	.015	1	.015	.009	.924	.000	.009	.102
VideoType	PI	.069	1	.069	.105	.747	.001	.105	.118
	PE	.861	1	.861	.935	.335	.005	.935	.252
	EB	2.473	1	2.473	1.967	.162	.011	1.967	.403
	BA	.974	1	.974	1.863	.174	.010	1.863	.389
	CE	43.206	1	43.206	26.174	.000	.126	26.174	1.000
Error	PI	119.546	182	.657					
	PE	167.528	182	.920					
	EB	228.811	182	1.257					

	BA	95.143	182	.523
	CE	300.425	182	1.651
Total	PI	5048.556	185	
	PE	4741.000	185	
	EB	2708.719	185	
	BA	6424.875	185	
	CE	3965.120	185	
Corrected Total	PI	132.447	184	
	PE	175.805	184	
	EB	238.578	184	
	BA	96.637	184	
	CE	344.695	184	

a. R Squared = .097 (Adjusted R Squared = .087); b. R Squared = .047 (Adjusted R Squared = .037); c. R Squared = .041 (Adjusted R Squared = .030)

d. R Squared = .015 (Adjusted R Squared = .005); e. R Squared = .128 (Adjusted R Squared = .119); f. Computed using alpha = 0.10

Table F-8: Estimates

Dependent Variable	VideoType	Mean	Std. Error	90% Confidence Interval	
				Lower Bound	Upper Bound
PI	360DCVS	5.174[a]	.084	5.035	5.313
	TCVS	5.135[a]	.085	4.994	5.276
PE	360DCVS	5.035[a]	.099	4.871	5.200
	TCVS	4.898[a]	.101	4.731	5.065
EB	360DCVS	3.539[a]	.116	3.347	3.731
	TCVS	3.773[a]	.118	3.577	3.968
BA	360DCVS	5.921[a]	.075	5.797	6.045
	TCVS	5.774[a]	.076	5.648	5.900
CE	360DCVS	3.944[a]	.133	3.724	4.164
	TCVS	4.920[a]	.135	4.696	5.143

a. Covariates appearing in the model are evaluated at the following values: AgeRe = 1.9459.

Table F-9: The Justified Descriptive Statistics based on VideoType * AgeRe

Dependent Variable	VideoType	AgeRe	Mean	Std. Error	90% Confidence Interval	
					Lower Bound	Upper Bound
PI	360DCVS	1.00	5.521	.204	5.183	5.859
		2.00	5.174	.101	5.007	5.342
		3.00	4.619	.309	4.108	5.130
		4.00	4.333	.334	3.781	4.885
	TCVS	1.00	5.587	.178	5.292	5.882
		2.00	5.075	.104	4.904	5.247
		3.00	4.833	.289	4.355	5.311
		4.00	.[a]	.	.	.
PE	360DCVS	1.00	5.167	.242	4.767	5.566
		2.00	5.087	.120	4.889	5.285
		3.00	4.619	.365	4.015	5.223
		4.00	4.167	.394	3.514	4.819
	TCVS	1.00	5.159	.211	4.810	5.507
		2.00	4.914	.123	4.711	5.117
		3.00	4.417	.342	3.852	4.981
		4.00	.[a]	.	.	.
EB	360DCVS	1.00	4.141	.279	3.679	4.602
		2.00	3.496	.138	3.267	3.725
		3.00	2.589	.422	1.892	3.287
		4.00	3.125	.456	2.372	3.878
	TCVS	1.00	3.804	.244	3.401	4.206
		2.00	3.794	.142	3.560	4.029

		3.00	3.813	.395	3.160	4.465
		4.00	.[a]	.	.	.
BA	360DCVS	1.00	6.078	.182	5.778	6.379
		2.00	5.904	.090	5.755	6.053
		3.00	5.750	.275	5.296	6.204
		4.00	5.750	.297	5.259	6.241
	TCVS	1.00	5.929	.159	5.666	6.191
		2.00	5.710	.092	5.557	5.862
		3.00	5.969	.257	5.544	6.394
		4.00	.[a]	.	.	.
CE	360DCVS	1.00	4.188	.318	3.662	4.713
		2.00	3.982	.158	3.721	4.242
		3.00	2.857	.481	2.062	3.652
		4.00	4.133	.519	3.275	4.992
	TCVS	1.00	4.724	.278	4.265	5.183
		2.00	4.923	.162	4.655	5.190
		3.00	5.425	.450	4.681	6.169
		4.00	.[a]	.	.	.

a. This level combination of factors is not observed, thus the corresponding population marginal mean is not estimable.

Appendix G: MANCOVA Analysis: Gender and PreExperiences

The Chi-square/T test in Table 1 indicates that Gender (Chi-square=5.183; df=1; p=.023 < .10) and PreExperiences (Chi-square =84.019; df=1; p<0.001) are dependent on VideoType. Henseler (2016) noted such variable were not ideally to perform MANCOVA test, this study still sees the value for adding these two covariates. Both Shapiro-wilk normality tests signified a not normally distributed data; Skewness and Kurtosis for both covariates suggested a firmly fair distribution. Exceptional in terms of EB is skewed when comparing with Gender (1.061); EB (-1.048) and CE (-1.010) also exceeded the threshold of -1 to 1 when comparing with PreExperience, but in an acceptable range. Herein, the data were normally distributed in terms of the skewness and kurtosis. Therefore, a separate MANCOVA analysis was performed accordingly.

Gender as the Covariates: The Box's Test (Box's M=19.373; F=1.254; Sig.=.223) is non-significant, suggesting a normally distributed of variance between groups. The Levene's Test of Equality of Error Variances is only significant in terms of CE (F(1,183)=5.078; P=.025 < .10). Therefore, caution should be made regarding CE. The Wilks' Lambda test suggests that there is significant relationship between Gender and dependent variables (F (5, 177)=9.983, p=.000 <.10; Wilks' Λ = .780; partial η 2 = .220) with an observed power of 1.000; as well as a significant interaction between VideoType and Gender.

PreExperiences as the Covariate: The Box's Test result does not changed, but the Levene's Test explained the significant differences among EB, CE and VideoType. As cells do not account equally, cautions should be altered when analyzing the MANCOVA result. Wilks' Lambda test suggested a significant interaction between VideoType and PreExperiences on five dependent variables (F (5, 179)=6.378, p=.000 <.10; Wilks' Λ = .719; partial η 2 = .152).