

國立政治大學國際傳播英語碩士學位學程

International Master's Program in  
International Communication Studies  
College of Communication  
National Chengchi University

碩士學位論文

Master's Thesis

與 360 度照片互動：使用自我決定論探討社群媒體使  
用者的愉悅感和行為動機

Interact with the 360-degree picture: Employ the self-  
determination theory in explaining social media user's enjoyment  
and behavioral intention

Student: Shih-Hsien Sue Lin 林詩賢

Advisor: Dr. Jih-Hsuan Tammy Lin 林日璇 博士

中華民國一零九年一月

January 2020

## Abstract

Despite the increasing number of the 360-degree picture appears on social media, the effective use of the technology remained unknown. Applying self-determination theory (SDT), this study examined whether the factors of competence, autonomy, relatedness, and presence were correlated with interactivity, media enjoyment, and behavioral intention. Fifty-six participants participated in the online field experiment on social media-based brand communities to either (1) interact with the 360-degree picture or (2) see the conventional flat picture. The findings indicated that people with the expertise of 360-degree technology had greater competence, and people who had traveling experience with Gogoro had greater autonomy when they interacted with the panoramic picture than a flat picture, whereas it had no significant effect on relatedness. Also, the positive correlation between autonomy and presence was found; autonomy of the 360-degree picture was related to enjoyment, whereas presence was not. Moreover, the results suggested that social media users had higher media enjoyment on the flat picture than the 360-degree picture, which, together with customer/other customer relationship, were influential in the user's behavioral intention.

**Keywords:** 360-degree picture 、 Interactivity 、 Self-determination

Theory 、 Autonomy 、 Presence 、 Media enjoyment 、 Brand community

## Table of Contents

Chapter 1. Introduction .....	6
1.1 360-degree picture on social media.....	6
1.2 Social media-based brand community.....	7
Chapter 2. Literature Review.....	9
2.1 Active viewing and passive viewing.....	9
2.2 Motivations of Self-Determination Theory (SDT).....	10
2.3 Interactivity and SDT.....	12
2.3.1 User-machine interaction and competence.....	13
2.3.2 User-message interaction and autonomy.....	14
2.3.3 User-message interaction and relatedness .....	17
2.4 Interactivity of the 360-degree picture, autonomy, presence, and media enjoyment .....	18
2.4.1 360-degree picture and presence .....	18
2.4.2 Autonomy and spatial presence.....	19
2.4.3 Media enjoyment as the effect of autonomy and presence .....	20
2.5 Media enjoyment and behavioral intention.....	21
Chapter 3. Method .....	25
3.1 Participants and design .....	25
3.2 Procedures and Stimulus .....	26
3.3 Measures.....	26
3.3.1 Independent variables .....	26
3.3.2 Dependent variables .....	27
3.3.3 Control variables .....	30
Chapter 4. Results.....	32

4.1 Two-way ANOVA for H1a-c .....	32
4.2 Serial mediation for H2-H5 .....	34
4.3 Simple mediation model for H6.....	36
Chapter 5. Discussion .....	38
5.1 Interactivity and needs satisfaction .....	38
5.1.1 Interactivity and competence .....	38
5.1.2 Interactivity and autonomy .....	40
5.1.3 Interactivity and relatedness.....	40
5.2 Interactivity, autonomy, presence, and media enjoyment .....	41
5.2.1 Autonomy and presence.....	41
5.2.2 Presence and media enjoyment .....	42
5.2.3 Autonomy and media enjoyment.....	43
5.2.4 Autonomy and presence as mediator .....	44
5.3 Media Enjoyment, behavioral intention, and customer/other customer relationship .....	47
5.4 Limitations .....	48
Chapter 6. Conclusion.....	50
References.....	54
APPENDIX A: Measurement.....	62
APPENDIX B: Questionnaire (Interactivity).....	64
APPENDIX C: Questionnaire (No Interactivity) .....	70

## List of Figures and Tables

Figure 1 The proposed relationship of interactivity, autonomy, presence, and media enjoyment. ....	21
Figure 2 The proposed relationship of interactivity, media enjoyment, behavioral intention, and customer/other customers relationship. ....	24
Figure 3 Interaction of 360-degree expertise $\times$ interactivity on competence. ....	33
Figure 4 Interaction of Gogoro travel experience $\times$ interactivity on autonomy. ....	34
Figure 5 Path coefficients and indirect effects for serial mediation model of interactivity on media enjoyment through needs satisfaction and presence. ....	36
Figure 6 Mediation effect of media enjoyment between the relationship of interactivity and behavioral intention with the covariate of customer/product, customer/brand, customer/company, and customer/other customer relationship. ....	37
Figure 7 Final Model .....	37
Table 1 Definitions of competence, autonomy, and relatedness. ....	12
Table 2 Descriptives of Autonomy, Presence, and Media Enjoyment on three levels of interactivity. ....	35

## Chapter 1. Introduction

Facebook users spend time browsing through funny images and videos and support their favorite brand by joining some brand communities to be fed with the latest information and viral pictures. Recently, the emergence of the 360-degree picture on Facebook has guided the users to step into the scene, making people feel more immersive than the conventional picture. The 360-degree picture builds the scene surrounding the audience, and the audience can interact with the picture. The users of social media sites have started to embrace the new way of sharing life memories, but there is less discussion about how the feature of the interactive 360-degree picture on Facebook may satisfy the user's psychological needs, determining their usage patterns. This study examines the interactivity of the 360-degree feature and explores whether it can prompt users to participate in the brand-related activity in the context of social media-based brand community.

### 1.1 360-degree picture on social media

National Geographic's Facebook Fan Page has published a post of 360-degree video since 2016: getting closer to the brown bears in the wildlife from the angle of being in the center of the river. The post has gone viral with more than one hundred thousand sharing, twenty-two thousand likes, and ten thousand comments, the users praising the immersive feeling that 360-degree technology has achieved. There is also a Facebook Fan Page, Facebook 360, aiming at discovering 360-degree videos and photos, including the topics of art, nature, sports, travel, and VR game. Even though Facebook has allowed users to upload interactive 360-degree picture and video, the feature is still not as popular as the conventional picture and video when it comes to the user's daily usage habits and marketing. For example, in the campaign of the 360-degree sportive camera, Gopro recommended the users to share user-generated content (UGC).

However, most of the uploaded videos are shot with the 360-degree camera but edited into the flat video, which has framed the audience's viewing angles without any interactivity. The technology of 360-degree images has not convinced the marketers and general users on Facebook due to the cost of taking 360-degree pictures. Taking the 360-degree picture requires either a panoramic camera (e.g., Insta 360, GoPro, Ricoh Theta, Samsung Gear 360) or holding a mobile device for a longer second to capture the environment. However, with the trend of more immersive advanced technology, from Google cardboard to virtual reality headsets, the users are pursuing the immersive entertainment experience from high pixel fix-angle convention pictures to the interactive 360-degree picture. As a result, it is necessary to conduct an in-depth analysis to understand whether Facebook user's interactive image viewing engagement is related to the nuanced psychological change in the hope of providing insights and prediction for future 360-degree technology development and application.

## 1.2 Social media-based brand community

The social media-based brand community constructs consumers' relationships with the brand, product, company, and other consumers (Habibi, Laroche, & Richard, 2014). Customers are interested in exposing themselves to the contents produced by the brand and product usage experiences shared by the other customers. Community engagement refers to the consumer's identification with the brand community, and highly engaged consumers have "intrinsic motivation to interact and cooperate with community members" (Algesheimer, Dholakia, & Herrmann, 2005, p.21). The community members voluntarily interact on social media with the activity of sharing pictures, videos, liking, and commenting on the posts.

This study focuses on the Gogoro Fan Club, an electric scooter Facebook club. Most of the members in this online fan club have purchased Gogoro. There is various type of

contents shared on this social media-based brand community, including organizing a face-to-face trip regularly and holding the brand event. The posts can accumulate hundreds of likes, and some of them will go viral on media, triggering the users to generate more contents that keep the community vibrant. What's more, those posts have symbolized a fun brand image, which is co-created by the community members. The users can identify with the product, brand, and other community members throughout their interaction on social media. Their community engagement can differentiate from those who read and like the posts to those who participate in the offline rider's community activity. Even though it is evident that the post's content has an impact on the user's identification with the brand community, there is a scarce discussion about the form of content on social media. Therefore, this study investigates how the form of the 360-degree picture on social media can enhance the user's media enjoyment and behavioral change.

The results of this study are expected to provide a practical explanation to the current phenomenon on Facebook, which the emergence of 360-degree picture features can deem as either interesting or superfluous, depending on how the audiences perceive the content (Gambino, Kim, & Sundar, 2017). The paper is organized as follows. First, the interactivity of the 360-degree picture is defined, comparing to the conventional picture. Second, self-determination theory is employed to explicate the online user's psychological mechanisms toward the interactive 360-degree picture in the context of the social media-based brand community, and the third section shows the proposed method and measures to explore this issue.



## Chapter 2. Literature Review

### 2.1 Active viewing and passive viewing

Drawing from existing theories of audience behavior, the debate of active and passive audiences has occurred since the beginning of the TV watching era. Cultivation theory has seen audiences as passive recipients who invisibly consume the worldview as a daily ritual and shape the reality in the long term (Gerbner et al., 1986). In succession with the prosperity of TV in the 1960s, Hauben & Hauben (1997) discussed the phenomenon of 'Netizens' which has rapidly created new habits for audiences to get access to news, recreation, and social community. Nevzat (2018) revived cultivation theory in new media and pointed out that the audiences are active participants whose everyday reality is constructed by social media with its meaning-making messages. At this point, the emergence of new technology, which was internet by then, had challenged the bottom line of communication study's proposition, abandoning the concept of considering audiences to be purely passive recipients who are fed by the content on TV.

Bauer (1964) proposed a communication study paradigm shift from analyzing mass society to analyzing the receivers who contain the "obstinate" mindset to defend the messages which are produced by media. That is, Bauer (1964) had seen the audiences as rational and self-determining individuals. Building upon the concept of self-determining audience, Levy and Windahl (1984) interpreted a seemingly passive TV watching behavior as the audiences are actually exerting their effort to select, involve, and use the media. To further consolidate the argument of active-passive dichotomy in mass communication theory, Abiocca (1988) suggested that cognitive information processing such as information gain in memory is also a sign to determine the audience's activity or passivity.

Diverging from the discrepancy of active-passive audience debate, this study proposes that the flat picture seeing behavior on social media is relatively passive. That is, conventional photos do not require the user's self-determining mindset to interpret the information. As a result, "passive viewing" represents no interactivity and engagement with the picture itself, whereas "active viewing" means that the users can develop the interactivity with the 360-degree picture. For passive viewing, the users can only look at the picture with the framed angle. In contrast, active viewing requires the users to click and drag or swipe the photo to switch the perspectives in the 360-degree view.

With the emergence of the 360-degree picture, the new technology can open up a new discussion in the communication study, as what TV has brought up a half-century ago. The proposition of active-passive viewing in this study shares the fundamental framework of whether the audience is a passive receiver or active individual. An interactive 360-degree picture can turn a passive receiver of the picture into an active individual who has to select the perspective and involve in the scenario. Due to the interactivity provided by the 360-degree picture, this paper further discusses how active viewing may influence the audience's psychology in the virtual community.

## 2.2 Motivations of Self-Determination Theory (SDT)

According to SDT, the human is motivated to satisfy three innate psychological needs: competence, relatedness, and autonomy, which are essential to maintain an individual's well-being (Ryan & Deci, 2000). When a volitional activity satisfies the three motivational constructs, they can predict people's direction of behavior, such as more likely to continue engaging the activity (Deci & Ryan, 1985). Wang and Li (2016) examined that the need for relatedness derived from social interaction motivates the users to participate in social network sites (SNSs). Kelley and Alden (2016) studied that the consumers with the satisfaction of the innate needs can highly identify with the

online brand community. Ryan, Rigby, & Przybylski (2006) found that autonomy, competence, and relatedness gained from game playing are associated with short term effects of media enjoyment and future playing intention.

SDT can be applied to explain the need satisfaction of not only digital media but also traditional media. Even though the reader's only choice is whether to read a book or not, the reader is still able to identify with the character in the book. In the same way, when social media users scroll down the post, their only choice is to look at the picture, but the users can pleasantly identify with the figure in the picture, which further arouses human's fantasy and fulfill people's psychological needs. For example, in the heroic narrative, the reader or player can develop their identification with the hero who accepts the trial (autonomy), masters their ability to fight (competence), and helps others (relatedness) (Rigby & Przybylski, 2009). The readers immerse themselves in the story and imagine themselves as the hero. Likewise, the photo in the social media-based brand community offers scenarios in which the users can experience the Gogoro trip. For example, the narrative in the picture is showing that the community members traveled freely and happily (autonomy), rode their Gogoro (competence), and hanged out with friends (relatedness). Even though the narrative in the non-interactive picture has already provided three intrinsic needs satisfaction, interactive media can be more need-satisfying and compelling than the conventional one (Rigby & Ryan, 2016). Thus, the following literature review will further discuss the interactive 360-degree picture's connection with one's autonomy, competence, and relatedness in three specific ways. In sum, Table 1 shown the definitions of competence, relatedness, and autonomy from theoretical definition (Ryan & Deci, 2000), online brand community (Kelley & Alden, 2016), gaming (Ryan, Rigby, & Przybylski, 2006), and traditional media (Rigby & Przybylski, 2009).

Competence	Autonomy	Relatedness	Study
A need for challenge and feelings of effectance	A sense of volition or willingness when doing a task	When a person feels connected with others	Theoretical definition (Deci & Ryan, 2000)
An individual's need to adept in exercising and communicating his/her capabilities.	An individual's need to originate one's own actions and behaviors.	An individual's need to have interaction and connectedness to others.	Online brand community Kelley & Alden (2016, p793)
Master intuitive controls; ongoing optimal challenging task.	The degree of choice that one has to take the goals.	Interactions between real players within multiplayer games.	Gaming Ryan, Rigby, & Przybylski (2006, p349-350)
Heroes stretch their abilities and overcome and master challenges.	Confident and courageous heroes blaze new trails.	Trustworthy heroes feel needed.	Traditional media Rigby & Przybylski (2009)

Table 1 Definitions of competence, autonomy, and relatedness

## 2.3 Interactivity and SDT

The technique of 360-degree visualization dates back to 1787 when an English painter, Robert Barker, draw 360-degree images in a building, which allowed the viewers to feel as if they are in another landscape (Ellis, 2008). Afterward, panoramic photography is invented in the 1980s but with the unaffordable camera. In recent years, the panoramic camera has become affordable in the market to enrich the digital world. The 360-degree image requires viewers in the center to move their head or screen around to look at the picture thoroughly. As 360-degree interactivity is broadly used nowadays in the forms of picture, video, and virtual reality, 360-degree interactivity requires closer examination.

Cho and Leckenby (1997) classified interactivity into user-machine interaction and user-message interaction. This chapter firstly discusses how the compatibility of the 360-degree picture on PC and mobile devices, comparing with conventional picture

scrolling on social media can lead to different degrees of competence in the layer of user-machine interaction. Secondly, this study hypothesizes how the 360-degree interactive content can impact on one's autonomy and relatedness from a user-massage interaction perspective.

### 2.3.1 User-machine interaction and competence

The conditions that enhance one's sense of competence include learning a new skill, being challenged, or experiencing positive feedback after completing a task (Ryan, Rigby, & Przybylski, 2006). Competence is a driver for the continued media usage and entertainment, and competence is even related to one's social comparison behavior while the users see the photos (Reinecke, Vorderer, & Knop, 2014). Using social media to browse through pictures is an ordinary skill for users who have joined the social media-based online community. Nevertheless, even though PC and mobile devices have become a standard tool for media use, not every user on social media has been familiarized with the 360-degree picture. Nikou and Economides (2017) investigated that one's performance in mobile-based learning is related to the individual's perceived ease of use and perceived usefulness. In the first-time user experience, the instruction icon, gesture, and technique to swipe the panoramic picture can be confusing and challenging. Alternatively, for people who dip into the 360-degree technology, they can enjoy the positive feedback from interactivity. That is, the 360-degree picture's usability is determined by the user's perceived ease of use, influencing their intrinsic motivation and enjoyment. From this point of view, the users on the Gogoro Fan club can have different levels of knowledge regarding the 360-degree picture, which is influenced by their perception of the 360-degree picture's usefulness. Therefore, among those who have the expertise of the 360-degree picture, they can experience a higher level of competence after interacting with the 360-degree picture.

For those who are not familiar with the 360-degree picture, their original ability to use social media is undermined. As mentioned by Ryan, Rigby, & Przybylski (2006, p350), institutive controls are defined as "easily mastered" controls which "do not interfere with one's sense of being in the game." While using the 360-degree picture, the interactivity will turn mobile devices into a less institutive control device. As a result, for those who have not known the 360-degree picture, they will get a lower sense of competence because they cannot exert their will to control the picture's directions smoothly. This study hypothesizes that people's expertise of the 360-degree picture will influence how the users on the Gogoro fan club's level of competence when they interact with the 360-degree picture. Moreover, the competence will be higher among those who interact with the 360-degree picture when the user has the expertise of the 360-degree picture. Otherwise, the competence will be lower among those who interact with the 360-degree picture when the user is not familiar with the 360-degree picture, comparing with the conventional picture.

*H1a Interacting with the 360-degree picture will cause a higher perception of competence than seeing the conventional picture for participants with the expertise of the 360-degree picture, but will not for those subjects without the expertise of the 360-degree picture.*

### 2.3.2 User-message interaction and autonomy

The aspect of user-machine interactivity alone is not adequate to capture the feature of 360-degree technology. With the emerging of user-generated 360-degree pictures and videos on social media, the way that the audiences interpret the embedded message in 360-degree storytelling is worthy of studying. Kwok and Yu (2013) examined that on restaurants' fan page, showing photos can receive the highest likes and comments

because the message is more straightforward to the audience. Su, Reynolds, & Sun (2015) found that in a hotel's Facebook fan page, pictures is a controversial approach because it can boost sharing but hinder comment on the post. These content analysis findings can be explained by the study of Schnotz (2005) that picture comprehension is perception-based processing, in which visuospatial patterns is crucial to short-term and long-term memory. This study further explores how the 360-degree picture's visual comprehension plus interactivity can influence the audience.

When it comes to interactive narratives, the readers have to determine the direction of story plots rather than witness the story, and interactive narratives can facilitate the user's identification with the characters more than traditional narratives because they can put themselves in the character's shoes (Green & Jenkins, 2014). With the interactivity, the audiences are capable of placing themselves in the story with the character, leading to higher media enjoyment, comparing to traditional media (Green, Brock, & Kaufman, 2004). SDT has been applied to explain the needs satisfaction derived from the narrative. For example, in a heroic narrative, no matter the medium is a book, video game, or massively multiplayer online games, the readers or players can develop their identification with the hero and gain a sense of autonomy (Rigby & Przybylski, 2009). That is, the audiences enjoy immersing themselves in the story narrative because they imagine that they have the freedom to exert their will as being the hero. Likewise, this study expects that the users in the social media-based brand community can mirror themselves in other member's pictures of the Gogoro trip. The 360-degree interactivity will trigger the user's identification because there is more spatial-visual space for imagination than a flat picture. Currently, there is a scarce explanation about how the interactivity of seeing a picture's different directions can motivate the audience's identification through autonomy.



The current study argues that the users who look at the 360-degree picture can decide how much he or she is willing to explore the photographer's perspectives within the picture. With the freedom to look at different directions, the level of autonomy in media use will get higher. That is, the user gains a sense of choice and volition derived from making decisions and actions to switch the angles in the 360-degree picture. The fulfillment of autonomy will intrinsically motivate people to look for more interesting and enjoyable perspectives in the 360-degree picture. There will be a long second of transportation into the panoramic picture's scenario, comparing to a flat picture. Specifically, when the users interact with the 360-degree picture, they can feel as if they are standing in the center of the place, which has shared the identification of the figure in the picture. Thus, the users can identify further with the scooter owner in the Gogoro online community and the activity of traveling around Taiwan with Gogoro.

However, not every community member is considered the same level of identification while looking at the 360-degree picture. According to Shin (2018), in the VR environment, only users with high empathy personality traits can strongly feel the character's emotion and situation. That is, in the context of Gogoro owners, this study should take into account the 360-degree interactivity and the aspect of the media user's original identification with the Gogoro trip. For those who have experienced the Gogoro trip, they can gain a higher emotional and cognitive process toward the picture. As a result, this study assumes that the behavior of exploring the 360-degree picture's different directions will positively related to the user's autonomy, comparing to those who see the flat picture, among the owner who has experienced Gogoro trip; otherwise, people without Gogoro trip experience will show no difference on the level of autonomy while interacting with the 360-degree picture, comparing to the flat picture.



*H1b Interacting with the 360-degree picture will cause a higher perception of autonomy than seeing the conventional picture for participants with the experience of the Gogoro trip, but will not for those subjects without the experience of the Gogoro trip.*

### 2.3.3 User-message interaction and relatedness

Digital affordance is seen as the interactions between people and technology, especially for the design of digital artifacts on the website (Majchrzak & Markus, 2012). There is a certain extent of interactive objects designed on social media, such as clicking like button, scrolling down endless posts, and commenting on the post. The user's sense of relatedness is connected with these features, instead of interacting face to face with a person. In Carr, Wohn, & Hayes (2016)'s study, they used the term paralinguistic digital affordances to explain how the language has been transferred to click "like" buttons, and these "like" cues have more impact on social support as one of the human needs. While the user interacts with the button, the other user simultaneously receives the caring feeling. When social media users receive "likes" on their posts, their need for relatedness is satisfied (Wang & Li, 2016). However, there remains a need to explore further how the action gives feedback to the individual who clicks the button.

Lee, Hansen, & Lee (2016) found that Facebook "like" as virtual endorsement is motivated because people with high self-esteem click to express their enjoyment to another user, and people with low self-esteem click to please others. The current study argued that both types of users interact with the click button in order to satisfy the individual's need for relatedness with others. The feature of the 360-degree picture on social media would have become a digital cue that the users can show concern for the other member in the brand community, corresponding to people's need to enhance one's relatedness with others. Even though the person who posted the picture could not

notice who was interacting with the picture, the user who interacted with the picture could intrinsically feel closer to the individual. The way that users click or pan to look around in the 360-degree picture can be deemed as one of the digital affordance features on social media. The developing equivalent paralinguistic relationship of clicking to look around in the 360-degree picture remains to be examined. Therefore, this study proposes that the factor of relatedness is associated with the interactive feature of the 360-degree picture in a social media-based brand community.

*H1c Interacting with the 360-degree picture will cause a higher perception of relatedness than seeing the conventional picture for participants.*

## 2.4 Interactivity of the 360-degree picture, autonomy, presence, and media enjoyment

### 2.4.1 360-degree picture and presence

Scholars from different entertainment media fields (e.g., literature, social media, virtual reality, and game) have used the concept of “presence” to discuss how mediated virtual experience can bring a sense of being into a human’s real experience. The term presence is defined as “a psychological state in which virtual objects are experienced as actual objects in either sensory or nonsensory ways” (Lee, 2004, p. 27). In other words, presence is a sense of “being located in the mediated environment,” which can intensify media enjoyment (Wirth et al., 2007, p. 495). There are two categories of presence applied in understanding virtual communities and mobile communication. When people are using social media, social presence refers to “the degree to which the stimulus conveyed the perceived presence of participants in the communication exchange” (Fortin & Dholakia, 2005, p. 394). For example, in order to increase social presence, mobile instant messaging is designed with emoji and stickers to increase virtual facial

expression and non-verbal cues. What's more, social presence plays an essential role through clicking "like" on the Facebook brand page, which is used to build online brand communities (Pongpaew, Speece, & Tiangsoongnern, 2017). However, to acknowledge the user's virtual presence in the 360-degree picture, social presence alone is not adequate for evaluating the user's perception of interactivity.

When it comes to the 360-degree technology, spatial presence refers to the extent to which the audiences "feel transported to another place, as though they are physically located inside the virtual environment" (Tamborini & Skalski, 2006, p.227). Spatial presence can occur when the reader imagines themselves in the text and film (Weibel, Wissmath, & Mast, 2011). In addition to screen size, the form of film, such as HD image quality, provides the viewers with higher levels of presence (Bracken, 2005). That is, the concept of presence has been extended from VR (Schuemie et al., 2001) to traditional media (Bracken, 2005).

Even though painting and drawing are not defined as media, which can bring presence in the past studies, the visual representation on social media has become more important nowadays, worthy discussing more 360-degree picture's vividness and interactivity. In contrast to the viewing experience of the passive film, also called motion picture, the social media users can actively select their viewpoints on a 360-degree picture, in which the technology has endeavored to create a sense of presence for the users so that the user can imagine themselves in the scene.

#### 2.4.2 Autonomy and spatial presence

Since the 360-degree picture is panoramically recorded, its autonomy and interactivity are somewhat limited than VR; however, a sense of spatial presence is expected to be higher when users watch the 360-degree picture on social media than the flat picture because of the form of interactivity. For example, Wu and Lin (2018) found the 360-

degree advertising videos with different levels of the naturally mapped perceptual interface (i.e., VR headset > tablet > PC) shown significant different levels of spatial presence. Furthermore, this study assumes that under the same user interface, which is using the Facebook fan page with mobile, the added interactivity on the 360-degree picture can lead to a higher presence versus non-interactivity picture.

The commonplace about the 360-degree picture and virtual reality experience is that the users have to execute their will to decide which direction to look at and manipulate their intentions to explore different viewpoints. As Zeltzer (1992) pointed out that VR fulfills autonomy, interaction, and presence among media transformation, the scholar had defined the three core factors of VR implementation. This study proposes that the interactivity of the 360-degree picture can also refer to the combination of autonomy and presence. While using VR to see the 360-degree picture is controlled by HMD's direction, the 360-degree picture on social media is controlled by a mobile phone. The level of presence will occur due to an individual's autonomy to control the picture's directions.

*H2 Autonomy will be positively related to presence.*

#### 2.4.3 Media enjoyment as the effect of autonomy and presence

As for the effect of presence, in the condition of game playing, Tamborini et al. (2004) found that spatial presence can provide a positive mood state for the violent game player, which reduced their thoughts of acting hostility in the real world. Watching a pre-game story video can enhance game evaluation, comparing with non-story video (Park et al., 2010). Therefore, a sense of being in the 360-degree picture is expected to increase media enjoyment positively. This study assumed that using PC and mobile devices to interact with the 360-degree pictures, comparing non-interactive convention pictures, can manifest a higher spatial presence and further have an impact on media enjoyment.

*H3 Presence will be positively related to media enjoyment.*

There is another way that 360-degree picture's interactivity can positively relate to media enjoyment. According to SDT, the fulfillment of one's autonomy can lead to media enjoyment (Deci & Ryan, 2000). At the moment, social media users identify Gogoro in the first centered scene. If the users are willing to explore further, they are capable of shifting to different directions, which they can more comprehensively immerse themselves into the mediated environment. Interactivity, which is a physical gesture movement on mobile, psychologically satisfies the user's autonomy, leading to media enjoyment and continued usage behavior.

*H4 Autonomy will be positively related to media enjoyment.*

While the users intuitively see the picture with different directions, they will find that they are in the center of the panoramic scene, so that they feel transported into the picture. The higher sense of presence developed by the effect of autonomy will mediate between interactivity and media enjoyment.

*H5 (Mediation): (a) Autonomy will mediate interactivity on media enjoyment (interactivity → autonomy → media enjoyment). (b) Presence will further mediate the effect of autonomy on media enjoyment (interactivity → autonomy → presence → media enjoyment).*

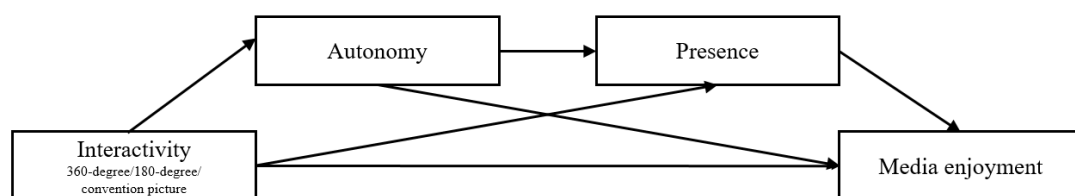


Figure 1 The proposed relationship of interactivity, autonomy, presence, and media enjoyment.

## 2.5 Media enjoyment and behavioral intention

Reinecke, Vorderer, & Knop (2014) investigated that competence derived from the user's self-presentation, autonomy derived from easily access the information, and relatedness derived from virtual interaction were positively related to Facebook usage enjoyment. Ryan, Rigby, & Przybylski (2006) found that in-game autonomy and in-game competence heightened the game enjoyment and preference for future play. Tamborini et al., (2010) offered evidence that game controls positively predicted competence and autonomy, social play context positive predicted relatedness, and the three needs satisfaction positively predicted media enjoyment. That is, media enjoyment came from individuals intrinsically needs. Based on the interactivity of video game and Facebook usage, this study aimed to extend the current developments in SDT that the interactivity of the 360-degree picture can also be accounted for intrinsic media enjoyment. This study proposes that the interactivity of the 360-degree picture will fulfill individual intrinsic needs, leading to higher enjoyment of using the 360-degree picture, comparing to seeing the flat picture.

Video and interactive contents on the Facebook brand's fan page can further drive the user's purchase intentions (Martínez-Navarro & Bigné, 2017). Choi, Hickerson, & Lee (2018) investigated that the positive affect of panoramic travel experience pictures can influence tourists' behavioral intention, comparing to still pictures. To further address the effectiveness of the 360-degree picture's media enjoyment in the social media-based brand community, this study designed the scenario of the Gogoro trip to motivate the community member's plan for the Gogoro trip. There were examples that online community members used Facebook as a tool to call for action. Sweeney et al. (2014) examined that an online community that frequently emphasizes energy saving contents influences one's relatedness to the other community members, resulting in one's intention to carry out the behavior. When a social networking site is built to motivate

users to engage, the social media can meet people's need for the feeling of closeness and a sense of connection, leading to the user's sustainability and loyalty on the site (Krishen et al., 2016). Kim and Drumwright (2016) found that consumers' interest in brand activities on social media is associated with perceived relatedness, resulting in future intention to engage in brand activities.

In the context of the social media-based brand community, the relatedness is originated not only from user to user but also consumer's self-image congruity with the brand. Self-image congruity in the study of consumer behavior and social psychology represents that consumers consider their self-concept and favorable brand when they purchase a product (Sirgy, 1985). After the purchase process, the connection between the consumers and brand community is not linked by one's purchase intention, but a long-term commitment and shared value. Christodoulides, Jevons, & Bonhomme (2012) indicated that consumer's perceptions of self-concept positively affect user-generated content involvement. The Gogoro owners in the online brand community often share how they travel with Gogoro in the cities, mountains, and seaside, corresponding to the brand's fun image. The relationship between consumer's self-concept and brand in the brand community forms a loop of re-emphasizing each other. Thus, behavioral intention is supposed to be based on a customer's long term relationship with the online brand community. In order to manifest the interactivity of the 360-degree picture on media enjoyment, the current study includes consumers' relationship with the factors of a brand community based on social media (i.e., brand, product, company, and other consumers) (Habibi, Laroche, & Richard, 2014) as a control condition to investigate how the behavioral intention after interacting with the 360-degree picture can be influenced directly by media enjoyment. The hedonic nature of Gogoro derived from user-generated contents in the social media-based brand community makes the brand



an ideal context to examine the influence of 360-degree interactivity on media enjoyment and online user's behavioral intention for offline activity.

*H6 Interactivity with the 360-degree picture can enhance the user's enjoyment, resulting in behavioral intention to travel with Gogoro, considering customer/brand relationship, customer/product relationship, customer/company relationship, and customer/other consumers relationship.*

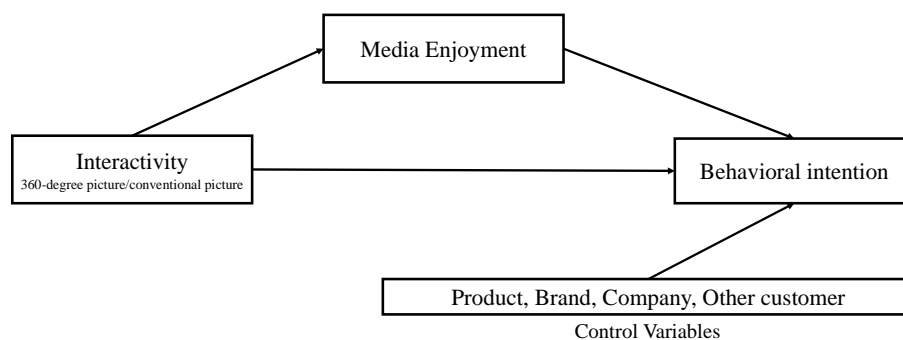


Figure 2 The proposed relationship of interactivity, media enjoyment, behavioral intention, and customer/other customers relationship.

To summarize, this study develops and tests SDT for the interactivity of the 360-degree picture on Facebook (H1a-H1c). This study also explores the role of presence within the model of SDT, which is the relationship between autonomy and presence, deriving from the interactivity of the 360-degree picture (H2). Furthermore, this study establishes that, in terms of the 360-degree picture viewing experience, both (a) a sense of presence and (b) the user's satisfaction of psychological needs, refer to autonomy, will positively influence the individual's intrinsic media enjoyment (H3 & H4). This study further proposes the serial mediation model to define the role of autonomy and presence between interactivity and media enjoyment (H5a-H5b). Back to the context of social media based-brand community, customer's offline behavioral intention will be facilitated by media enjoyment, in terms of the 360-degree picture's interactive experience, together with the factors of customer and brand relationships on the fan



page (H6). To sum up, this study integrates the factors of SDT and presence to explain the interactivity of the 360-degree picture, aiming to confirm the critical role of SDT in the context of the media field, extending the field of work from traditional media to evolving interactive media.

## Chapter 3. Method

### 3.1 Participants and design

This study employed an online experiment on two social media-based brand communities on Facebook in Taiwan. The experimental group with the 360-degree picture was recruited on Gogoro Fan Club from December 13 to 16, 2019. The control group of no interactivity picture was collected on Gogoro 2 Series Fan Club from December 14 to 21, 2019. The members of the former clubs are 129,749 people with averagely 56 posts a day, and the latter is 66,868 people with averagely 62 posts a day (estimated on January 1, 2020). The club members typically posted user-generated contents with a variety of images to engage Gogoro members and scooter riding experience sharing. A brief informed consent of the research was agreed before the survey start. The incentive for participants was the lottery for 6 Gogoro masks.

In the post-experiment questionnaire, a set of filter questions were asked to make sure the experimental group did look at the right angles, and the control group did not see the stimulus of the 360-degree picture. Thirty participants were in the experimental group and 26 in the control group. However, three people missed the angle of seeing Gogoro in the picture, resulting in 27 validated participants in the experimental group. Also, there were only 25 validated participants in the control group because one participant did not own a Gogoro. The majority of the participants used mobile devices ( $N = 46$ ; 88.5%), and other participants used PC ( $N = 6$ ; 11.5%) to complete the experiment and post-survey. The participants aged 18 to 47, averagely 29-year-old (SD

= 7.29), composed of 27 male (51.9%) and 25 female (48.1%) who lived in Northern Taiwan (N = 28; 53.8%), Central Taiwan (N = 9; 17.3%), and Southern Taiwan (15; 28.8%).

The demographic from Gogoro Fan Club and Gogoro 2 Series Fan Club showed no significant difference, validating the samples to be comparable. An independent t-test showed the mean of age had no significant difference between Gogoro Fan Club (M = 30.15, SD = 8.46) and Gogoro 2 Series Fan Club (M = 27.40, SD = 5.59),  $t(45.381) = 1.392, p = .17$ .

### 3.2 Procedures and Stimulus

The stimulus was posted on Gogoro Owners Club on Facebook with a post-experiment survey self-administered web questionnaire link. The participants were informed that the post was with the purpose of communication study. The feature of the 360-degree picture on Facebook allowed the participants to interact with the picture. The picture was taken by the Samsung Gear 360 camera. The camera and tripod were placed in the center of the sightseeing spot with the background of beautiful and tranquil scenery. The front of the camera shot directly at Gogoro, so the participants looked at Gogoro at first sight. While the participants interacted with the picture, they were able to discover the scenery around and found the owners sit on the opposite side of the picture.

### 3.3 Measures

The questionnaire had two parts, demographic profiles and construct items. The questionnaire was firstly developed in English and then translated into Mandarin, which is the native language for most of the participants in Taiwan. Demographic information about gender, age, income, and region were collected as well as the ownership of Gogoro.

#### 3.3.1 Independent variables

The independent variable has three groups. In the experimental group, the participants were recoded into 180-degree and 360-degree as two degrees of interactivity. 180-degree represented that the users had a limited field of view, so they did not notice the scene in the opposite of Gogoro, where two girls were sitting on a bench. 360-degree represented that the user had found both Gogoro and the girls in the picture. Thirdly, the control group was the participants who saw the conventional picture without interactivity.

### 3.3.2 Dependent variables

Player Experience of Needs Satisfaction (PENS) scale measures in-game satisfaction of competence, autonomy, relatedness, presence, and intuitive controls (Ryan, Rigby, & Przybylski, 2006). However, Johnson, Gardner, & Perry (2018) found that intuitive controls and competence are statistically single factor construct. Hence, this study adapted the PENS into three main factors to measure the user's competence, autonomy, relatedness. All variables were measured on a 7-point Likert scale, ranging from 1 (strongly disagree) to 7 (strongly agree). To fit in the context of the current study, the description of “interacting with the 360-degree picture” in one group was replaced by “seeing the picture” in the other group.

#### **Competence**

The variable ( $M = 5.7$ ,  $SD = 1.37$ ,  $\alpha = .95$ ) was measured by asking the level of agreement on the following statements: (1) “I feel competent in interacting with the 360-degree picture.” / “I feel competent in seeing the picture.” (2) “I feel very capable when interacting with the 360-degree picture.” / “I feel very capable when seeing the picture.” (3) “I feel effective when interacting with the 360-degree picture.” / “I feel effective when seeing the picture.”, (4) “My ability to interacting with the 360-degree picture is well-matched with the design of 360-degree interactive feature on Facebook.”

/ “My ability to seeing the 360-degree picture is well-matched with the feature design on Facebook.”

### **Autonomy**

The variable ( $M = 5.54$ ,  $SD = 1.39$ ,  $\alpha = .94$ ) was measured with 4 items: (1) “The 360-degree picture provides me with interesting options and choices.” / “The picture provides me with interesting options and choices.” (2) “I could always find something interesting in the 360-degree picture.” / “I could always find something interesting in the picture.” (3) “I interacted with the 360-degree picture just for the fun of it.” / “I saw the picture just for the fun of it.” (4) “I experienced a lot of freedom in the 360-degree picture.” / “I experienced a lot of freedom in the picture.”

### **Relatedness**

The variable ( $M = 5.5$ ,  $SD = 1.55$ ,  $\alpha = .97$ ) was measured with two items: (1) “I find the relationship with other community members I formed in the 360-degree picture fulfilling.” / “I find the relationship with other community members I formed in the picture fulfilling.” (2) “I find the relationship with other community members I formed in the 360-degree picture important.” / “I find the relationship with other community members I formed in the picture important.” A reversed item “I don’t feel close to other community members in the 360-degree picture” was removed because it did not pass the reliability test.

### **Presence**

The telepresence scale to measure presence was adopted from Klein (2013) with 7 items, consisted of 7-point Likert scales, ranging from 1 (strongly disagree) to 7 (strongly agree). The variable ( $M = 4.90$ ,  $SD = 1.39$ ,  $\alpha = .89$ ) was assessed through five items: (1) “After interacting with the 360-degree picture, I felt like I came back to the “real world” after a journey.” / “After seeing the picture, I felt like I came back to the “real

world” after a journey.”, (2) “The 360-degree picture came to me and created a new world for me, and the world suddenly after interacting with it.” / “The picture came to me and created a new world for me, and the world suddenly after interacting with it.”, (3) “During interacting with the 360-degree picture, I felt I was in the world the 360-degree picture created.” / “During seeing the picture, I felt I was in the world the picture created.” (4) “During interacting with the 360-degree picture, my body was on the seat, but my mind was inside the world created by the 360-degree picture.” / “During seeing the picture, my body was on the seat, but my mind was inside the world created by the picture.” (5) “During interacting with the 360-degree picture, the 360-degree-picture-generated world was more real or present for me compared to the “real world.” / “During seeing the picture, the picture-generated world was more real or present for me compared to the ‘real world.’

After conducting the reliability test, two reversed items were removed, which were “The 360-degree-picture-generated seemed to me only “something I saw” rather than “somewhere I visited.” / “The picture-generated seemed to me only “something I saw” rather than “somewhere I visited.” and “During interacting with the 360-degree picture, my mind was in the room, not in the world created by the 360-degree picture.” / “During seeing the picture, my mind was in the room, not in the world created by the picture.”

### **Media enjoyment**

The variable ( $M = 5.60$ ,  $SD = 1.09$ ,  $\alpha = .83$ ) was assessed with seven items adopted from the scales of Intrinsic Motivation Inventory (McAuley, Duncan, & Tammen, 1989), consisted of seven Likert-style items. (1) “I enjoyed interacting with the 360-degree picture very much.” / “I enjoyed seeing the picture very much.” (2) “Interacting with the 360-degree picture was fun to do.” / “Seeing the picture was fun to do.” (3) “I thought interacting with the 360-degree picture was a boring activity.” / “I thought

seeing the picture was a boring activity.” (reversed), (4) “Interacting with the 360-degree picture was a boring activity” / “Seeing the picture was a boring activity.”, (5) “I would describe interacting with the 360-degree picture as very interesting.” / “I would describe seeing the picture as very interesting.” (6) “I thought interacting with the 360-degree picture was quite enjoyable.” / “I thought seeing the picture was quite enjoyable.” (7) “While I was interacting with the 360-degree picture, I was thinking about how much I enjoyed it.” / “While I was seeing the picture, I was thinking about how much I enjoyed it.”

### **Behavioral intention**

The variable ( $M = 6.15$ ;  $SD = 1.11$ ;  $\alpha = .94$ ) was elicited from seven-point Likert scales of Ajzen and Driver (1992) and Huang et al. (2016). As riding Gogoro can be deemed as daily transportation as well as a recreational activity, the measurement emphasizes the latter. Additionally, the questionnaire includes the standing alone traveling plan (1) “I plan to engage in this Gogoro travelling in the next 6 months.”, (2) “I will try to engage in this Gogoro travelling in the next 6 months.”, information seeking (3) “I will request more travelling information about how to ride Gogoro to this sightseeing spot.”, and shared traveling plan (4) “I will suggest other people travel with Gogoro.”, (5) “I will share this Gogoro travelling information with my friend.” (6) “I will invite my friend to visit the place together with Gogoro.”

### **3.3.3 Control variables**

Four factors of the customer’s relationship with the social media-based brand community were measured by the scales developed by McAlexander, Schouten, & Koenig (2002) and Laroche, Habibi, & Richard (2013). All items were modified into a seven-point Likert scale.

### **Customer/product relationship**

The variable ( $M = 6.67$ ;  $SD = .69$ ;  $\alpha = .87$ ) was measured using: (1) “I love my Gogoro scooter.”, (2) “I am proud of my Gogoro scooter.”, (3) “My Gogoro scooter is one of my favorite possessions.”, (4) “My Gogoro scooter is fun to ride.”

#### **Customer/brand relationship**

The variable ( $M = 5.63$ ;  $SD = 1.37$ ;  $\alpha = .78$ ) was measured using: (1) “I value the Gogoro heritage.”, (2) “If I were to replace my Gogoro scooter, I would buy another Gogoro.”, (3) “Gogoro is of the highest quality.”

#### **Customer/company relationship**

The variable ( $M = 4.48$ ;  $SD = 1.82$ ;  $\alpha = .96$ ) was measured using: (1) “The Gogoro understands my needs.”, (2) “The Gogoro cares about my opinions.”

#### **Customer/other customers relationship**

The variable ( $M = 5.95$ ;  $SD = 1.18$ ;  $\alpha = .87$ ) was measured using: (1) “I have met wonderful people because of the Gogoro community.” (2) “I have a feeling of kinship with the other Gogoro owners.”, (3) “I have an interest in the community because of the other Gogoro owners”.



## Chapter 4. Results

### 4.1 Two-way ANOVA for H1a-c

**H1a** predicted whether the level of competence differs by interactivity among those who have expertise in the 360-degree technique. To test the hypothesis, a moderation effect of the expertise of the 360-degree picture between the interactivity and competence was found. The moderator variable was “whether the user has the experience of uploading the 360-degree picture/video on social media before”. Individuals’ level of competence was subjected to a two-way ANOVA with two levels of interactivity (360-degree, no interactivity) and two levels of the 360-degree picture expertise (experienced, no experience). The main effect of interactivity was not significant,  $F(1, 48) = 3.94, p = .053$ , such that picture with interactivity ( $M = 5.81, SD = 1.50$ ) had no differ levels of competence compared to no interactivity ( $M = 5.65, SD = 1.23$ ). The main effect of expertise was not significant,  $F(1, 48) = .12, p = .73$ , suggesting that the 360-degree expertise ( $M = 5.97, SD = 1.28$ ) had no differ levels of competence than without 360-degree expertise ( $M = 5.68, SD = 1.39$ ). However, the interaction of 360-degree expertise  $\times$  interactivity was significant,  $F(1, 48) = 6.52, p < .05$ . The effect is portrayed in Figure 3. As shown, in the 360-degree picture group, competence was greatest if the user has had uploaded the 360-degree picture on social media before ( $M = 6.95, SD = 0.11$ ). In contrast, competence was the lowest if the user has had uploaded on social media before but only saw a conventional picture ( $M = 4.75, SD = 0.89$ ). That is, the user’s expertise of uploading a 360-degree picture differed the user’s competence level while the user responded to the 360-degree picture and conventional picture. Therefore, H1a is supported.



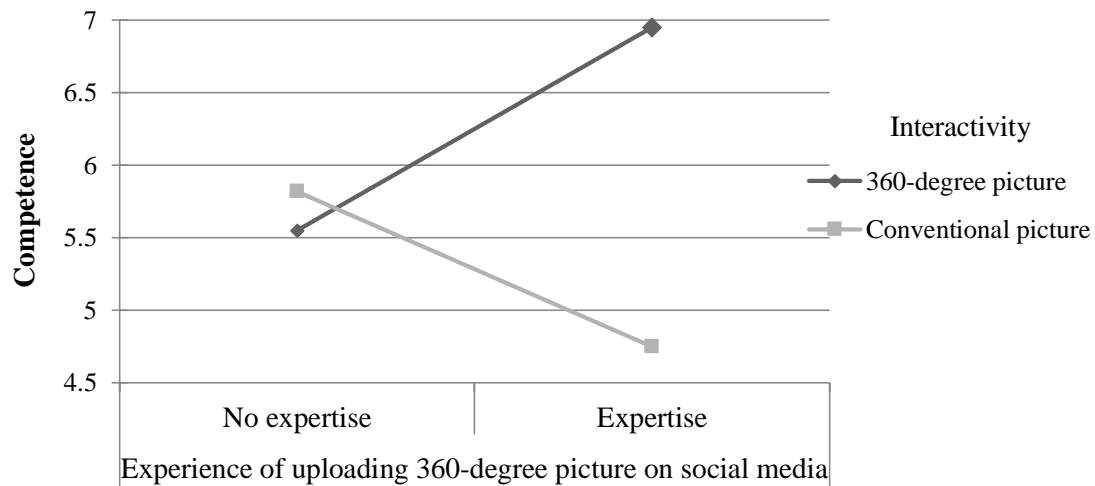


Figure 3 Interaction of 360-degree expertise  $\times$  interactivity on competence.

**H1b** predicted whether the level of autonomy differs by interactivity among those who have travelled with Gogoro. To test the hypothesis, a moderation effect of the Gogoro travel experience between the interactivity and autonomy was found. The moderator variable was “have you hung out with Gogoro before.” Individuals’ level of autonomy was subjected to a two-way ANOVA with two levels of interactivity (360-degree, no interactivity) and two levels of the 360-degree picture expertise (experienced, no experience). The main effect of interactivity was not significant,  $F(1, 48) = 1.43, p = .24$ , such that picture with interactivity ( $M = 5.85, SD = 1.35$ ) had no differ levels of autonomy compared to no interactivity ( $M = 5.21, SD = 1.38$ ). The main effect of Gogoro travel experience was not significant,  $F(1, 48) = 4.59, p = .11$ , suggesting that Gogoro travel experience ( $M = 5.79, SD = 1.35$ ) had no differ levels of autonomy than no Gogoro travel experience ( $M = 5.15, SD = 1.58$ ). However, the interaction effect of Gogoro travel experience  $\times$  interactivity was significant,  $F(1, 48) = 4.59, p < .05$ . The effect is portrayed in Figure 4. As shown, in the 360-degree picture group, autonomy was greatest if the user has had travelled with Gogoro before ( $M = 6.37, SD = 0.92$ ). In contrast, autonomy was the lowest if the user has had travelled with Gogoro before

but only saw a conventional picture ( $M = 4.98$ ,  $SD = 1.54$ ). That is, the user's Gogoro travel experience differed the user's autonomy level while the user responded to the 360-degree picture and conventional picture. Therefore, H1b is supported.

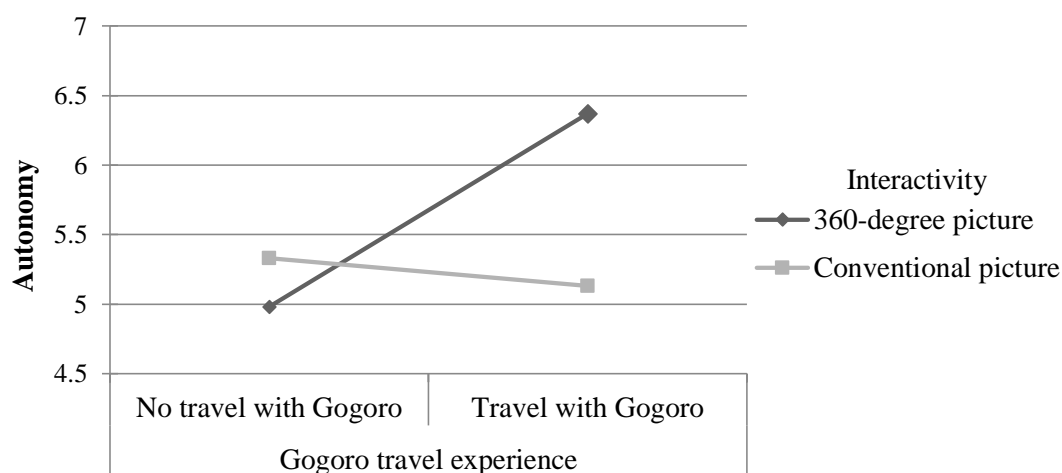


Figure 4 Interaction of Gogoro travel experience  $\times$  interactivity on autonomy.

**H1c** predicted whether the level of relatedness differs by interactivity. An independent-samples t-test was conducted to compare relatedness between the group of interacting with the 360-degree picture and the group of seeing no interactivity picture. The Levene's test indicated equal variances ( $F = 2.50$ ,  $p = .12$ ). There was no significant difference in relatedness between the group of interacting with the 360-degree picture ( $M = 5.74$ ,  $SD = 1.33$ ) and the group of seeing conventional picture ( $M = 5.3$ ,  $SD = 1.76$ );  $t(50) = 1.02$ ,  $p = .31$ . The result indicated that H1c is not supported. People who interacted with the 360-degree picture did not have a higher level of relatedness compared to people who did not interact with the picture.

## 4.2 Serial mediation for H2-H5

To test the indirect effect of whether the impact of interacting with the 360-degree picture was driven by autonomy to positively anticipate presence, which in turn leads to increased media enjoyment, this study employed Model 6 in the PROCESS macro

developed by Hayes (2017). The independent variable of interacting with the 360-degree picture was categorized as two levels of interactivity, which were people who had saw the picture within 180-degree direction and people who had fully seen the 360-degree direction. The categorized standard was whether the participant had seen the object in the opposite of the scooter. Next, this study used dummy codes, setting no interactivity group versus 180-degree group and no interactivity group versus 360-degree group. The mediation model was run with 5,000 bootstraps resamples. The descriptive mean is showed in Table 2.

Descriptives		Mean	SD
Autonomy	360-degree	6.03	0.28
	180-degree	5.59	0.50
	No interactivity	5.21	0.28
Presence	360-degree	5.00	0.35
	180-degree	5.02	0.39
	No interactivity	4.78	0.29
Media Enjoyment	360-degree	5.51	0.29
	180-degree	5.35	0.37
	No interactivity	5.77	0.20

Table 2 Descriptives of Autonomy, Presence, and Media Enjoyment on three levels of interactivity.

**H2-H4** As Figure 5 shows, the results indicated that (i) interactivity (1 = 360-degree, 0 = No interactivity) significantly affected autonomy ( $b = .49$ ,  $SE = .23$ ,  $p < .05$ ); (ii) as an additional check, interactivity (1 = 180-degree, 0 = No interactivity) had a nonsignificant effect on autonomy ( $b = .26$ ,  $SE = .17$ ,  $p = .33$ ); (iii) interactivity (1 = 360-degree, 0 = No interactivity) significantly but negatively impacted media enjoyment ( $b = -.63$ ,  $SE = .25$ ,  $p < .001$ ); (iv) autonomy is significantly positive on presence ( $b = .79$ ,  $SE = .21$ ,  $p < .001$ ). H2 is supported. (v) presence is insignificantly negative on media enjoyment ( $b = -.08$ ,  $SE = .10$ ,  $p = .43$ ). H3 is not supported. (vi) autonomy is significantly positive on media enjoyment ( $b = .36$ ,  $SE = .17$ ,  $p < .05$ ). H4

is supported.

**H5a** proposed the mediation model in which interactivity leads to media enjoyment via autonomy. However, the indirect effect was not statistically significant through autonomy ( $b = .03$ ,  $SE = .06$ , 95% CI  $[-.0691, .1751]$ ). These results do not support H5a

**H5b** tested the role of presence in the serial mediation model. Nonetheless, the results showed insignificant indirect effect of interactivity through autonomy and presence ( $b = -.03$ ,  $SE = .05$ , 95% CI  $[-.1635, .0514]$ ). The result failed to support a mediating role for presence in the effect of interactivity and autonomy.

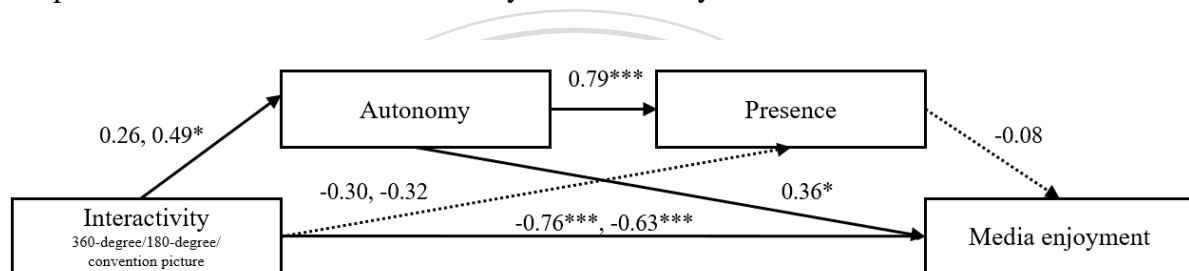


Figure 5 Path coefficients and indirect effects for serial mediation model of interactivity on media enjoyment through needs satisfaction and presence.

### 4.3 Simple mediation model for H6

**H6** tested whether participants' media enjoyment will positively mediate the relationship between interactivity and their behavioral intention toward travelling with Gogoro. A simple mediation analysis was performed using PROCESS Model 4 in the PROCESS macro developed by Hayes (2017). The result fails to support a mediating role for media enjoyment in the effect of the 360-degree (versus conventional) picture on behavioral intention. The result shown that media enjoyment mediated the effect of interactivity on behavioral intention ( $b = -.23$ ,  $SE = .14$ , 95% CI  $[-.5475, -.0019]$ ) but in a significantly negative way. As shown in Figure 6, note that even though media enjoyment has effect on behavioral intention ( $b = .39$ ,  $t(45) = 3.04$ ,  $p < .01$ ), interactivity negatively predicts media enjoyment ( $b = -.60$ ,  $t(46) = -2.18$ ,  $p < .05$ ).

Meanwhile, the control variables in the simple mediation model include customer/product relationship ( $b = .05$ ,  $t(45) = .27$ ,  $p = .79$ ), customer/brand ( $b = .04$ ,  $t(45) = .30$ ,  $p = .76$ ), customer/company relationship ( $b = .03$ ,  $t(45) = .36$ ,  $p = .72$ ), and customer/other customer relationship ( $b = .37$ ,  $t(45) = 2.87$ ,  $p < .01$ ). The four variables were used to control the user's Gogoro social media attitude which was assumed to influence one's behavioral intention. However, only customer/other customer relationship had shown significantly related with behavioral intention. All in all, H3 is not supported. Figure 7 is the final model founded in the result.

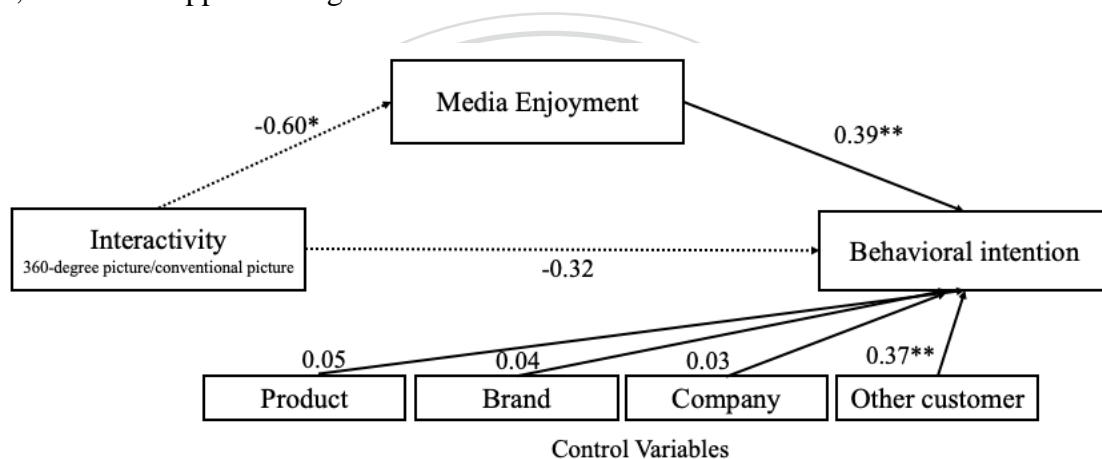


Figure 6 Mediation effect of media enjoyment between the relationship of interactivity and behavioral intention with the covariate of customer/product, customer/brand, customer/company, and customer/other customer relationship.

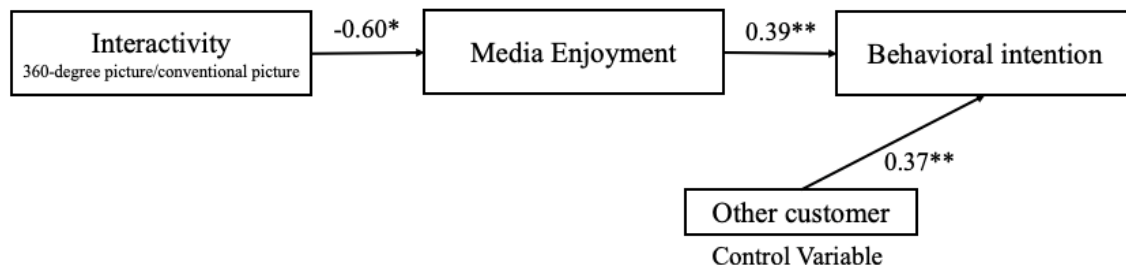


Figure 7 Final Model

## Chapter 5. Discussion

The combination of social media and the panoramic photo is an endeavor to represent real-world objects in a computer simulation. Regarding the needs satisfaction and presence, most of these studies have paid attention to virtual reality, MMORPG, and social media interaction (Ryan, Rigby, & Przybylski, 2006; Tamborini et al., 2010; Reinecke, Vorderer, & Knop, 2014). Rarely did they look into the topic with one further step of the 360-degree picture on social media, which is getting more popular on SNS. As photo sharing has become a common strategy on social media, it is essential to understand how a 360-degree picture can trigger the psychological factors due to its interactivity, other than a conventional picture. In addition to this, nowadays, marketers rely on Facebook to build its brand community, the effectiveness of the 360-degree picture on the customer's behavioral intention is thus worth discussing. Hence, this study applied the mediation model and serial mediation model to understand how the relationships among interactivity, media enjoyment, and behavioral intention are coped with people's psychological mechanisms.

### 5.1 Interactivity and needs satisfaction

Hypothesis 1 a-c explored the difference between interactivity group versus no interactivity group on needs satisfaction. The results showed that there is no direct effect of the interactivity on competence, autonomy, and relatedness. However, there are crossover effect of competence and the 360-degree picture expertise and crossover effect of autonomy and the Gogoro travel experience. The experiment provides a new insight that developing 360-degree technology depends on an individual's acceptance and attention.

#### 5.1.1 Interactivity and competence

The findings suggest strong support for the H1a that the level of competence among

people who have interacted with 360-degree picture was much more positive for those who had the expertise of the 360-degree picture. In other words, when the users have experience of uploading or seeing the 360-degree picture, they will pay more attention to the application of 360-degree technology.

According to Rogers (1995) innovation diffusion theory, the technology needs to offer improvements over available tools, consistent with the user's social practices, and ease of use. That is, among those who have uploaded the 360-degree picture before, they have experienced the flow from taking a panoramic picture, stitching the image, save it, and publish it on social media. They might found a panoramic picture's advantage of representing the moment with free directions, which has surpassed a flat picture that has framed angle limitation. Also, they are more curious and not bothered by having to move the devices in order to see the whole 360-degree picture. Thus, for this group of people, they're satisfied with exerting their new skill to interact with the 360-degree picture. In contrast, for those who are not familiar with the 360-degree picture, they showed lower competence than those who saw the conventional picture. It is likely that they have satisfied with seeing the flat pictures on social media, which has provided enough visual information to comprehend, so they are not desperate to learn how to use the 360-degree picture.

Another possible explanation is that the perceived usefulness is higher among those who have 360-degree expertise. According to Nikou and Economides (2017), they found that the perceived usefulness of mobile learning will influence the learner's competence. In other words, for the group who has had uploaded 360-degree pictures before, it means that they have had believed that 360-degree pictures could bring some benefit toward their life. As a result, while they are using the 360-degree picture, they

can realize the advantage of looking at more than one perspective in the picture, rather than hastily swipe through the image.

### 5.1.2 Interactivity and autonomy

The result of H1b suggests that those who have traveled with Gogoro before were likely to display higher autonomy toward interacting with the 360-degree picture than those who never traveled with Gogoro, comparing to see the flat picture. As the behavior of sharing travel experience is on social media, according to uses and gratification theory (Whiting & Williams, 2013), 80% of social media users use Facebook to look for information, including attending events. For those who have traveled with Gogoro before, they will seek out the other community member's traveling experience as a reference for their next trip plan, and they will be more identified with those member's traveling experience. Therefore, when they look into the 360-degree picture, they will thoroughly explore the objects and surrounding in the picture, leading to a higher sense of autonomy. For those who haven't traveled with Gogoro, the subject is not appealing to them, so while they interacted with the 360-degree picture, they cannot connect to their daily life experience with Gogoro. The users are not impressed by the sense of freedom that they can stand in the center of the scene as if a real journey, so the level of autonomy is the same as a flat picture.

### 5.1.3 Interactivity and relatedness

The result of H1c indicates that the levels of relatedness showed no difference among participants who interact with the 360-degree picture, comparing to those who see the conventional picture. The past study investigated that pictures could provide a sense of being for the viewers in a web-based environment (Fortin & Dholakia, 2005). This study argued that and interactivity of 360-degree pictures can further heighten the level of relatedness of people due to social presence in the panoramic picture. However, the



result was altered. It opened up the complexity of the premise of this study, which is that relatedness can derive from both social media usage and 360-degree picture. Krishen et al. (2016) suggested that SDT can explain three types of needs satisfaction on social media's virtual experiences, in which relatedness measures how member's willingness to help out each other. Social media usage, thus, has been recognized as people's intrinsic motivation behavior because the users do not rely on SNS's external rewarding for their enormous amount of time-consuming use. Gogoro fan club as a high customer to customer social bond community, the fulfillment of relatedness has already existed for they are willing to help out each other with no regard to the interactivity of 360-degree picture. Overall, even though our method had focused on the content difference and the questionnaire emphasized on "after seeing the picture" and "after interacting with the picture," it is inevitable that the participants included their past Gogoro Fan Club customer to customer interaction experience to rate their answers. The two aspects of SNS interaction and picture interactivity were mixed up, leading to an insignificant result.

## 5.2 Interactivity, autonomy, presence, and media enjoyment

### 5.2.1 Autonomy and presence

The result in H2 showed that autonomy is positively related to presence. The user interacts with the 360-degree picture by autonomously viewing different directions, providing a higher level of presence because the scenes surround the user. This study emphasizes that one's autonomy of seeing different directions is linked with one's sense of being in the picture. This result ties well with a previous study wherein virtual environment technology can fit with the variables of autonomy, interaction, and presence (Zeltzer, 1992). 360-degree pictures as recorded data can provide higher levels of autonomy and presence than a still picture. Also, this study has verified that using

mobile and PC to view the 360-degree picture on social media produced a similar result of Sato and Kageto (2020)'s study that during the student's experience of 360-degree videos with VR headsets, they observed a sense of being in the other group of student's fieldwork scenery.

Moreover, the roles of autonomy and presence are in line with previous studies (Kim et al., 2015; Jung, 2011). Kim et al. (2015) demonstrated that the feelings of autonomy were linked to a sense of physical presence in the game playing environment. Jung (2011) found that in the context of the virtual social world, while the user interacted with other social media users, the individual's perceived social presence leads to the fulfillment of one's perceived autonomy and continued usage of the virtual social world. That is, no matter social presence or spatial presence were proved to be related to autonomy depends on different digital media contexts. The finding of the positive relationship between autonomy and presence corresponds to the claims of Kool (2016) that VR medium's storytelling capacity permits the audience to alter the reception of said content. That is, interactivity assists the audience to become the owner of the story, and interacting with the 360-degree picture for a few more seconds can make social media users feel more into the scenario. Therefore, the 360-degree picture can fulfill the audience's needs satisfaction while they are intrinsically motivated to receive the message conveyed by the picture. As a result, this study indicates that one's autonomy of seeing the 360-degree picture directions is positively related to a higher level of presence.

### 5.2.2 Presence and media enjoyment

The finding in H3 indicated that presence was not significantly associated with media enjoyment. Contrary to the findings of Wirth et al. (2007) that spatial presence can intensify one's media enjoyment, this study found that the level of presence between

the groups of the 360-degree picture and non-panoramic picture had no different effect on media enjoyment. There is one possible explanation. According to Weibel, Wissmath, & Mast (2011)'s study, presence and media enjoyment are related to an individual's visual imagery ability and mediated environment. For example, people with low imagery ability can gain a higher level of presence and enjoyment while watching a film; on the contrary, high and low imagery ability people have no significant difference on their levels of presence and enjoyment while playing a computer game (Weibel, Wissmath, & Mast, 2011). That is, passive medium with a vivid visual cue or active medium requiring interactivity will give users different levels of presence and enjoyment. Back to the seeing experience of the 360-degree picture on social media, it provides users with rich visual cues and a certain level of interactivity. For the users of Gogoro Fans Club, they have got used to seeing the pictures in order to have recreation and gain media enjoyment, so the panoramic picture with more sensorial information cannot intensify the user's enjoyment through its presence. Another reason could be that the realistic of the panoramic picture may even decrease one's imagination to being in the place with unveiled adventurous fantasy, which in turn decreases enjoyment. Overall, it is possible that even though the 360-degree picture can provide a higher presence, the non-panoramic picture on social media has already fulfilled the user's media enjoyment with adequate visual cues, so the 360-degree picture with higher presence cannot increase media enjoyment.

### 5.2.3 Autonomy and media enjoyment

The result of H4 is consistent with what has been found in SDT that a sense of autonomy contributes to media enjoyment (Deci & Ryan, 2000). This study has verified that using the 360-degree picture on social media could produce similar results as the experimental settings of video games (Ryan, Rigby, & Przybylski, 2006; Tamborini et

al., 2010). The concept that an individual can see panoramic picture's different directions as a volition behavior is similar to game design that players have choices to move and take actions. Tamborini et al. (2010) pointed out that a natural mapped controller could provide the user with a sense of autonomy. This study found that using a smartphone, tablet, or PC to control the viewing direction of the picture can also satisfy one's autonomy needs. Thus, the study's design is directly in line with Tamborini et al. (2010)'s argument that "any form of media activity that gives the user choice over the media environment should satisfy autonomy needs... Internet providing near-infinite choices for entertainment content all offer the potential to satisfy autonomy needs" (p.771). Notably, this study goes beyond the previous video game's experimental setting and has replicated the finding in another interactive media form. What's more, this study has reduced the artificial restrictions on participant's willingness to use the media because they spontaneously interacted with the stimulus materials on social media, which corresponding to their daily media usage behavior. Afterward, the subjects filled in the questionnaire with lottery rewards as incentives in order to collect the data, which did not influence the flow of seeing the picture. Overall, the result confirmed SDT that autonomy could predict media enjoyment in the form of a 360-degree picture. A higher level of autonomy can lead to a higher level of media enjoyment, while the users are interacting with the picture. SDT provides the fundamental factors which contribute positively to one's well-being, and this study provides validated data that proved the photo can increase one's media enjoyment in the short term.

#### 5.2.4 Autonomy and presence as a mediator

It is worth discussing these interesting facts revealed by the statistically insignificant results of H5a and H5b that the interactivity led to media enjoyment via neither

autonomy nor presence. In line with the previous findings, it seems that media enjoyment cannot be explained by autonomy alone, since the autonomy in the result of H2 can positively contribute to presence. Nevertheless, the results of H3 and H4 showed that subjective media enjoyment was linked only to autonomy but not presence.

The possible explanation for the results in the serial mediation model is that, according to Table 3, due to the limitation of online experiment on the Facebook fan page, the study did not ensure each participant saw the panoramic picture in a 360-degree way. Some of them only saw the picture in a 180-degree way, so the effect of autonomy on interactivity was only significant in the 360-degree picture versus non-interactivity picture, which mainly decreased the mediation role of autonomy as a whole.

The group of 360-degree interactivity versus the group of no interactivity is positively related to autonomy. However, the group of 180-degree interactivity versus the group of no interactivity showed no difference in autonomy. It indicated that when the users interacted in a fully 360-degree way, they gained a higher sense of freedom to choose the directions, in which the users who interacted within 180-degree cannot achieve. That is, in the experimental settings, for those who joined the interactivity group, but who had behaved naturally only within 180-degree, that experience had no effect on an individual's autonomy. As for those who saw the whole panoramic picture in a total of 360-degree, the interactivity could contribute positively to the level of autonomy. Based on the finding, it is noteworthy that 360-degree picture technology is not a superfluous feature. If the users are willing to explore the panoramic picture in a 360-degree directions fully, the action can psychologically fulfill the audience's needs satisfaction. Furthermore, the results of this study suggested that presence is not related to interactivity. The following reasons could explain the contradictory results in the domain of 360-degree images. Firstly, Yamashita and Nakajima (2017), in their study

of the qualitative interview, reported that the seeing experience of the 360-degree picture on PC had a better presence than a typical flat picture. The possible explanation of the different results is that even though people can generalize their feeling, but the effect of interactivity between the two ways of seeing the picture is not so impactful that can be statistically different. After all, within the category of the picture, the flat picture had framed Gogoro and the beautiful traveling scenery together, so the visual cues may have led the users to imagine themselves being in the place. That is, the participants did not need to rely on the 360-degree picture to feel as if they are surrounded in the scene because there is no more story to tell from other directions.

Secondly, when it comes to the comparison of videos, rather than the pictures, the result of 360-degree versus flat video was more distinctive. For example, Aitamurto et al. (2018) found that when the viewer felt a higher level of the embodiment within the body of the photographer, the level of presence of the 360-degree and 180-degree videos were higher than the flat video. The discrepancy between the results of picture and video might be due to the duration of seeing (few second on picture versus a few minutes on video), display devices (Mobile and PC display versus VR HMD), and the center of camera (using tripod versus photographer's body nearby).

Thirdly, interactivity is categorized based on the control types, in which the users of 360-degree picture swipe on the tablet or swing the mobile to look at different directions. The present work is not in agreement with the study that a greater natural mapped controller is positively related to the level of presence (Skalski et al., 2011). On the contrary, the result showed that interactivity and non-interactivity conditions have no difference in the level of presence. Vorderer (2000) explained that some interactive media forms are not considered to be immersive may due to the users are not familiar with the control method, and the ease of use is rather low. Even though the interactivity

can increase people's sense of autonomy, the interactivity may interrupt the picture's passive seeing experience. Therefore, the users cannot have a sense of being in the 360-degree picture.

### 5.3 Media Enjoyment, behavioral intention, and customer/other customer relationship

Contrary to H6, the interactivity is negatively related to media enjoyment, but media enjoyment is positive to the behavioral intention. It indicated that people who saw the flat picture on social media could actually gain higher media enjoyment than a 360-degree picture. Furthermore, media enjoyment gained from the picture positively predicted their behavioral intention toward travelling with Gogoro. These findings are consistent with the phenomenon of Gogoro Fan Club that the scooter owners are willing to share their traveling experience through photos, and these photos can attract other Gogoro owners to join the activity. The result of significant customer/other customers relationship as covariate explains that social media as the main platform to summon Gogoro's brand spirit is mainly consolidated by the Gogoro owner's connection.

To further explain the result that interactivity is negatively related to media enjoyment, this study emphasized that autonomy, back to H4, is the main factor in bringing the users enjoyment when they interact with the 360-degree picture. It indicated that only when the 360-degree picture highly fulfills the user's autonomy, the media enjoyment can increase along with it. That is, it is necessary to figure out what kind of content can attract the user to explore the 360-degree panoramic picture fully. The more the users are willing to see different directions, the higher level of autonomy they can feel. The design of the stimulus, which is to see the Gogoro, the Gogoro owner, and the scenery on the mountain and lack might be not appealing to the users.

The findings of the customer/other customer relationship can make a supplement



explanation for the failed H1c. Contradicting to the extension of Carr, Wohn, & Hayes (2016)'s study, interactivity of the 360-degree picture has not become paralinguistic digital affordance. Interacting with the 360-degree picture is not a cue that can increase social support. That is, the quick and active picture seeing and swiping behavior cannot provide the user with a sense of relatedness. What matters in the social media-based brand community is the concept of long term connections within the Gogoro owners, accumulated by daily social media use. The findings reveal that not only media enjoyment gained from the pictures will increase one's behavioral intention, but customer/other customers relationship will also trigger participants' behavioral intention toward travelling with Gogoro.

#### 5.4 Limitations

This study did not examine the personality of the users on the social media-based brand community. Even though the expertise of the 360-degree picture and past Gogoro trip experiences were developed, which kind of people is more inclined to interact with the 360-degree picture remained unknown. As the 360-degree technology is in the developing stage, a longitude study is suggested, so that the study could provide a prospect of how the user accepts the 360-degree picture. This study is limited to the 360-degree picture, and the average measure of presence is 4.9 (nearly agree). Thus, a future study can examine the comparison of the 360-degree video and flat video on social media in order to create a higher level of presence. As this study adopted an online experiment in separate Gogoro Fan Pages, the media engagement, such as the amounts of like, share, and comment, were not included, so the study could not reflect if the users were more willing to engage with the 360-degree picture, comparing to the flat picture. The stimuli were designed for an individual's Gogoro trip, so the study did not dip into how the community member invited each other to participate in the group



activity, such as charitable events and beach cleanup. This study only used the questionnaire to confirm how many objects from four directions on the 360-degree picture did the user look at, so the future study is recommended to track the user's eye heatmap for where and how long the audiences pay attention. There is no measurement for emotion, so the hedonic media enjoyment is not further developed. As for the method of this study, the level of presence was not significantly different between the 360-degree picture and flat picture, so conducting the semi-structured interview after the experiment would advance the richness to explain the data.



## Chapter 6. Conclusion

The 360-degree picture on social media provides the opportunity for the users to stand in the center of the scene through PC, mobile, and tablet's display without the need for wearing headset and goggle. Such a communication tool is easily misunderstood with virtual reality (VR). Different from VR, which the user can control the avatar in the virtual world, gaining a higher sense of autonomy and presence (Schuemie et al., 2001; Zeltzer, 1992), the audience of the panoramic picture is considered as an active viewer that can control their seeing directions on the picture but have no further movement in the virtual environment. In order to explore whether the interactivity of an individual's visual experience can have an impact on one's intrinsic needs, presence, media enjoyment, and behavioral intention, this study compared the social media user's 360-degree picture versus flat picture's seeing experiences. It is critical to know whether the action of freely shifting the angles can satisfy the user's needs satisfaction of competence, autonomy, and relatedness because the validated study can provide the baseline for the future users, marketers, producers, and scholars to predict the user's acceptance and application of the 360-degree technology.

Theoretically, very little is known about the factors that may trigger the continued media using behavior on a 360-degree picture, so SDT, which has been adopted to explain the traditional media, video games, and social media, was used to guide this study. This study contributes to the empirical literature by expanding the research framework of SDT into a new media category. Also, SDT was applied in the context of social media's daily use environment, which is different from past studies that recruited the students to participate in the experiment.

The contribution of the study can be discussed in two aspects, theoretical contribution, and practical implication. With regards to the theoretical contribution, first of all,

different from the limitation of the past SDT study in the laboratory context (Ryan, Rigby, & Przybylski, 2006), this study conducted an online experiment on social media which the participants were self-selected to use the 360-degree picture and flat picture. The data is authentic because people voluntarily involved, corresponding to the regular social media user's intrinsic needs. By comparing the 360-degree picture and flat picture on social media, competence was found to be higher among those who used the 360-degree technology before; autonomy was found to be higher among those who travelled with Gogoro before; relatedness was found to be no difference. As this study considered the user's stickiness on a social media channel, the relatedness in the context of the Gogoro Fan Club was found to be undivided with the user's long-term relationship with the community.

Secondly, this study bridged the concept of presence and psychological theory onto the interactivity of the 360-degree picture, empirically validating the media enjoyment of 360-degree picture was mainly came from autonomy, instead of presence. The control of seeing picture's different directions can provide the users with enjoyment, but it is not related to the sense of being in the panoramic picture. Thirdly, this study examined that the 360-degree picture, comparing to the flat picture, was possible to decrease the user's media enjoyment, which would further decrease the user's behavioral intention on social media toward travelling with Gogoro. Overall, media enjoyment from the flat picture was more acceptable to the users on Gogoro Fan Club to share their travelling behavior, and the behavioral intention was affected by the long-term customer/other customer relationship on social media rather than the short-term effect of a 360-degree picture post.

For the practical implications, this study addressed that the user experiences of the 360-degree picture on social media were not in a shaped user flow because even among

people who had seen the 360-degree picture elsewhere, they could not gain a higher level of competence unless they were the experts and enthusiasts who had personally used the 360-degree technology. What's else, the present study suggested that for the 360-degree picture, video, and movie production, the content creators have to provide the audiences more interactivity, not only the freedom of looking at the 360-degree 's different directions but also the interactivity which has to be related to the audience's decision making, such as teleport or stare at an object to trigger the next scene. Otherwise, the users would not intentionally look around or fully explore the scene, which is a waste of the panoramic picture. The user's visual behavior has inevitably been trained to look at the framed screen, such as a PC monitor and movie screen, so some participants in the experiment settings only look at 180-degree on the picture or even less degree of freedom.

As this study found that autonomy is more prominent among people who have already been interested in the Gogoro trip, the author suggested while marketing the 360-degree picture and video the marketers can target those who already have an interest in the topic. For example, target audiences who are interested in wildlife will be recommended if National Geography is going to release a 360-degree field trip documentary. The nature lover will be more willing to explore the 360-degree picture and video, comparing to people who are not interested in the topic beforehand.

In the current study, the effect of the 360-degree picture on the customer's behavioral intention is not as expected. However, while the 360-degree picture is mostly applied in the travel industry, this study suggested that the strategy of applying a 360-degree picture is more suitable for people who are not in the type of high imaginary because the 360-degree picture is devoid of presence. A low imaginary type of people is more suitable for standing in the center of the realistic scene and not quickly be bored by it.

A high imaginary type of people will require more intriguing content, such as animation and a variety of shifting scenes and characters in the 360-degree video. Also, to supplement the media enjoyment, the interactivity of the 360-degree picture needs to accompany other social media strategies in order to increase the relatedness with other community members, triggering the user's behavioral intention. Thus, this study recommended the travel agency takes advantage of the Facebook fan page to unveil part of the traveling spot with the 360-degree picture, rather than a flat picture, but, meanwhile, the post should accompany some intriguing narrative text to open up the customer's imagination.



## References

- Abiocca, F. (1988). Opposing conceptions of the audience: The active and passive hemispheres of mass communication theory. *Annals of the International Communication Association*, 11(1), 51-80.
- Aitamurto, T., Zhou, S., Sakshuwong, S., Saldivar, J., Sadeghi, Y., & Tran, A. (2018). Sense of presence, attitude change, perspective-taking and usability in first-person split-sphere 360 video. In *Proceedings of the 2018 CHI Conference on Human Factors in Computing Systems* (pp. 1-12).
- Ajzen, I., & Driver, B. L. (1992). Application of the Theory of Planned Behavior to Leisure Choice. *Journal of Leisure Research*, 24(3), 207-224.
- Algesheimer, R., Dholakia, U. M., & Herrmann, A. (2005). The social influence of brand community: Evidence from European car clubs. *Journal of marketing*, 69(3), 19-34.
- Bauer, R. A. (1964). The obstinate audience. *American Psychologist*, 19, 319-328.
- Bracken, C. (2005). Presence and image quality: The case of high definition television. *Media Psychology*, 7(2), 191-205.
- Carr, C. T., Wohn, D. Y., & Hayes, R. A. (2016). As social support: Relational closeness, automaticity, and interpreting social support from paralinguistic digital affordances in social media. *Computers in Human Behavior*, 62, 385-393.
- Cho, C. H., & Leckenby, J. D. (1997). Internet-related programming technology and advertising. In *Proceedings of the Conference-American Academy of Advertising*, (pp. 69-79). American Academy of Advertising.
- Choi, Y., Hickerson, B., & Lee, J. (2018). Investigation of the technology effects of online travel media on virtual travel experience and behavioral intention. *Journal of Travel & Tourism Marketing*, 35(3), 320-335.

- Christodoulides, G., Jevons, C., & Bonhomme, J. (2012). Memo to marketers: Quantitative evidence for change: How user-generated content really affects brands. *Journal of advertising research*, 52(1), 53-64.
- Deci, E. L., & Ryan, R. M. (1985). The general causality orientations scale: Self-determination in personality. *Journal of research in personality*, 19(2), 109-134.
- Deci, E. L., & Ryan, R. M. (2000). The “what” and “why” of goal pursuits: Human needs and the self-determination of behavior. *Psychological Inquiry*, 11, 227–268.
- Ellis, M. (2008). ‘Spectacles within doors’: Panoramas of London in the 1790s. *Romanticism*, 14(2), 133-148.
- Fortin, D. R., & Dholakia, R. R. (2005). Interactivity and vividness effects on social presence and involvement with a web-based advertisement. *Journal of business research*, 58(3), 387-396.
- Gambino, A., Kim, J., & Sundar, S. S. (2017). Using theory of interactive media effects (TIME) to analyze digital advertising. In *Digital Advertising* (pp. 116-139). Routledge.
- Gerbner, G., Gross, L., Morgan, M., & Signorielli, N. (1986). Living with television: The dynamics of the cultivation process. *Perspectives on media effects*, 1986, 17-40.
- Green, M. C., & Jenkins, K. M. (2014). Interactive narratives: Processes and outcomes in user-directed stories. *Journal of Communication*, 64(3), 479-500.
- Green, M. C., Brock, T. C., & Kaufman, G. F. (2004). Understanding media enjoyment: The role of transportation into narrative worlds. *Communication Theory*, 14(4), 311-327.

- Habibi, M. R., Laroche, M., & Richard, M. O. (2014). The roles of brand community and community engagement in building brand trust on social media. *Computers in Human Behavior*, 37, 152-161.
- Hauben M, Hauben R. 1997. Netizens: On the History and Impact of Usenet and the Internet. Los Alamitos, CA: IEEE Computer Society Press.
- Huang, Y. C., Backman, K. F., Backman, S. J., & Chang, L. L. (2016). Exploring the implications of virtual reality technology in tourism marketing: An integrated research framework. *International Journal of Tourism Research*, 18(2), 116-128.
- Johnson, D., Gardner, M. J., & Perry, R. (2018). Validation of two game experience scales: the player experience of need satisfaction (PENS) and game experience questionnaire (GEQ). *International Journal of Human-Computer Studies*, 118, 38-46.
- Jung, Y. (2011). Understanding the role of sense of presence and perceived autonomy in users' continued use of social virtual worlds. *Journal of Computer-Mediated Communication*, 16(4), 492-510.
- Kelley, J. B., & Alden, D. L. (2016). Online brand community: through the eyes of self-determination theory. *Internet Research*, 26(4), 790-808.
- Kim, E., & Drumwright, M. (2016). Engaging consumers and building relationships in social media: How social relatedness influences intrinsic vs. extrinsic consumer motivation. *Computers in Human Behavior*, 63, 970-979.
- Kim, K., Schmierbach, M. G., Chung, M. Y., Fraustino, J. D., Dardis, F., & Ahern, L. (2015). Is it a sense of autonomy, control, or attachment? Exploring the effects of in-game customization on game enjoyment. *Computers in Human Behavior*, 48, 695-705.



- Klein, L. R. (2003). Creating virtual product experiences: The role of telepresence. *Journal of Interactive Marketing*, 17(1), 41-55.
- Kool, H. (2016). The Ethics of Immersive Journalism: A Rhetorical Analysis of News Storytelling with Virtual Reality Technology.” *Intersect: The Stanford Journal of Science, Technology & Society*, 9 (3), 1-11.
- Krishen, A. S., Berezan, O., Agarwal, S., & Kachroo, P. (2016). The generation of virtual needs: Recipes for satisfaction in social media networking. *Journal of Business Research*, 69(11), 5248-5254.
- Kwok, L., & Yu, B. (2013). Spreading social media messages on Facebook: An analysis of restaurant business-to-consumer communications. *Cornell Hospitality Quarterly*, 54(1), 84-94.
- Lee, K. M. (2004). Presence, explicated. *Communication theory*, 14(1), 27-50.
- Lee, S. Y., Hansen, S. S., & Lee, J. K. (2016). What makes us click “like” on Facebook? Examining psychological, technological, and motivational factors on virtual endorsement. *Computer Communications*, 73, 332-341.
- Levy, M., & Windahl, S. (1984). Audience activity and gratifications: A conceptual clarification and exploration. *Communication Research*, 11, 51-78.
- Majchrzak, A., & Markus, M. L. (2012). Technology affordances and constraints in management information systems (MIS). *Encyclopedia of Management Theory*, (Ed: E. Kessler), Sage Publications, Forthcoming.
- Martínez-Navarro, J., & Bigné, E. (2017). The value of marketer-generated content on social network sites: media antecedents and behavioral responses. *Journal of Electronic Commerce Research*, 18(1), 52.

- McAuley, E., Duncan, T., & Tammen, V. V. (1989). Psychometric Properties of the Intrinsic Motivation Inventory in a Competitive Sport Setting: A Confirmatory Factor Analysis. *Research Quarterly for Exercise and Sport*, 60(1), 48–58.
- Nevzat, R. (2018). *Reviving Cultivation Theory for Social Media*. MediAsia 2018: IAFOR, Japan.
- Nikou, S. A., & Economides, A. A. (2017). Mobile-Based assessment: Integrating acceptance and motivational factors into a combined model of Self-Determination Theory and Technology Acceptance. *Computers in Human Behavior*, 68, 83-95.
- Park, N., Lee, K. M., Jin, S. A. A., & Kang, S. (2010). Effects of pre-game stories on feelings of presence and evaluation of computer games. *International Journal of Human-Computer Studies*, 68(11), 822-833.
- Pongpaew, W., Speece, M., & Tiangsoongnern, L. (2017). Social presence and customer brand engagement on Facebook brand pages. *Journal of Product & Brand Management*, 26(3), 262-281.
- Rigby, C. S., & Przybylski, A. K. (2009). Virtual worlds and the learner hero: How today's video games can inform tomorrow's digital learning environments. *Theory and Research in Education*, 7(2), 214-223.
- Rigby, C. S., & Ryan, M. (2016). Time well-spent? Motivation for entertainment media and its eudaimonic aspects through the lens of self-determination theory. In L. Reinecke & M. B. Oliver (Eds.), *Handbook of media use and well-being* (pp. 34–48). London: Routledge.
- Rogers, E. M. (1995). Diffusion of Innovations: modifications of a model for telecommunications. In *Die diffusion von innovationen in der telekommunikation* (pp. 25-38). Springer, Berlin, Heidelberg.

- Ryan, R. M., & Deci, E. L. (2000). Self-determination theory and the facilitation of intrinsic motivation, social development, and well-being. *American Psychologist*, 55, 68–78.
- Ryan, R. M., Rigby, C. S., & Przybylski, A. (2006). The motivational pull of video games: A self-determination theory approach. *Motivation and emotion*, 30(4), 344-360.
- Sato, S., & Kageto, M. (2020). The use of 360-degree videos to facilitate pre-learning and reflection on learning experiences. *International Journal of Innovation and Learning*, 27(4), 381-394.
- Schnotz W. (2005). An integrated model of text and picture comprehension. In *The Cambridge Handbook of Multi-media Learning* (ed. R.E. Mayer) (pp. 49–69). Cambridge University Press, New York.
- Schuemie, M. J., Van Der Straaten, P., Krijn, M., & Van Der Mast, C. A. (2001). Research on presence in virtual reality: A survey. *CyberPsychology & Behavior*, 4(2), 183-201.
- Shin, D. (2018). Empathy and embodied experience in virtual environment: To what extent can virtual reality stimulate empathy and embodied experience?. *Computers in Human Behavior*, 78, 64-73.
- Sirgy, M.J. (1985). Using self-congruity and ideal congruity to predict purchase motivation. *Journal of Business Research*, 13 (3), 195-206.
- Skalski, P., Tamborini, R., Shelton, A., Buncher, M., & Lindmark, P. (2011). Mapping the road to fun: Natural video game controllers, presence, and game enjoyment. *New Media & Society*, 13(2), 224-242.

- Su, N., Reynolds, D., & Sun, B. (2015). How to make your Facebook posts attractive: A case study of a leading budget hotel brand fan page. *International Journal of Contemporary Hospitality Management*, 27(8), 1772-1790.
- Sweeney, J. C., Webb, D., Mazzarol, T., & Soutar, G. N. (2014). Self-determination theory and word of mouth about energy-saving behaviors: an online experiment. *Psychology & Marketing*, 31(9), 698-716.
- Tamborini, R., & Skalski, P. (2006). The role of presence in the experience of electronic games. In P. Vorderer & J. Bryant (Eds.), *Playing video games: Motives, responses and consequences* (pp. 225–240). Mahwah, NJ: Erlbaum.
- Tamborini, R., Bowman, N. D., Eden, A., Grizzard, M., & Organ, A. (2010). Defining media enjoyment as the satisfaction of intrinsic needs. *Journal of communication*, 60(4), 758-777.
- Tamborini, R., Eastin, M. S., Skalski, P., & Lachlan, K. (2004). Violent virtual video games and hostile thoughts. *J. Broad. & Elec. Media*, 48, 335.
- Vorderer, P. (2000). Interactive entertainment and beyond. In D. Zillmann & P. Vorderer (Eds.), *LEA's communication series. Media entertainment: The psychology of its appeal* (pp. 21–36). Lawrence Erlbaum Associates Publishers.
- Wang, X., & Li, Y. (2016). Users' satisfaction with social network sites: A self-determination perspective. *Journal of Computer Information Systems*, 56(1), 48-54.
- Weibel, D., Wissmath, B., & Mast, F. W. (2011). Influence of mental imagery on spatial presence and enjoyment assessed in different types of media. *Cyberpsychology, Behavior, and Social Networking*, 14(10), 607-612.

- Whiting, A., & Williams, D. (2013). Why people use social media: a uses and gratifications approach. *Qualitative Market Research: An International Journal*, 16(4), 362-369.
- Wirth, W., Hartmann, T., Böcking, S., Vorderer, P., Klimmt, C., Schramm, H., ... & Biocca, F. (2007). A process model of the formation of spatial presence experiences. *Media Psychology*, 9(3), 493-525.
- Wu, D. Y., & Lin, J. H. T. (2018). Ways of seeing matter: The impact of a naturally mapped perceptual system on the persuasive effects of immersive virtual reality advertising. *Communication Research Reports*, 35(5), 434-444.
- Yamashita, Y., & Nakajima, T. (2017). Comparison of 360 Degree Cameras and Normal Cameras in Terms of Presence. In *EdMedia+ Innovate Learning* (pp. 1182-1185). Association for the Advancement of Computing in Education (AACE).
- Zeltzer, D. (1992). Autonomy, interaction, and presence. *Presence: Teleoperators & Virtual Environments*, 1(1), 127-132.

## APPENDIX A: Measurement

Competence (Ryan, Rigby, & Przybylski, 2006; Johnson, Gardner, & Perry, 2018)
<p>I feel competent at interacting with the 360-degree picture.</p> <p>I feel very capable when interacting with the 360-degree picture.</p> <p>I feel effective when interacting with the 360-degree picture.</p> <p>My ability to interacting with the 360-degree picture is well-matched with the design of 360-degree interactive feature on Facebook.</p>
Autonomy (Ryan, Rigby, & Przybylski, 2006; Johnson, Gardner, & Perry, 2018)
<p>The 360-degree picture provides me with interesting options and choices.</p> <p>I could always find something interesting in the 360-degree picture.</p> <p>I interacted with the 360-degree picture just for the fun of it.</p> <p>I experienced a lot of freedom in the 360-degree picture.</p>
Relatedness (Ryan, Rigby, & Przybylski, 2006; Johnson, Gardner, & Perry, 2018)
<p>I find the relationship with the other community member I form in the 360-degree picture fulfilling.</p> <p>I find the relationship with the other community member I form in the 360-degree picture important.</p> <p>I don't feel close to the other community member in the 360-degree picture. (reversed)</p>
Enjoyment (McAuley, Duncan, & Tammen, 1989)
<p>I enjoyed interacting with the 360-degree picture very much.</p> <p>Interacting with the 360-degree picture was fun to do.</p> <p>I thought interacting with the 360-degree picture was a boring activity (reversed)</p> <p>Interacting with the 360-degree picture was a boring activity (reversed)</p> <p>I would describe interacting with the 360-degree picture as very interesting.</p> <p>I thought interacting with the 360-degree picture was quite enjoyable.</p> <p>While I was interacting with the 360-degree picture, I was thinking about how much I enjoyed it.</p>
Behavioral Intentions (Ajzen and Driver, 1992; Huang et al., 2016)

I plan to engage in this Gogoro activity in the next 6 months.

I will try to engage in this Gogoro activity in the next 6 months.

I will request more information about how to ride to this sightseeing spot.

I will share this information with my friend and invite he or she visit the place together with Gogoro.



## APPENDIX B: Questionnaire (Interactivity)

1. 在問卷正式填答開始前，請先確認你是否有看到 Po 文中分享的 360 度照片？

☐ 是，我要繼續作答。

☐ 否，我要再看一次貼文中的照片。

2. 請問你剛才在 Gogoro Fan Club 的貼文中，使用哪一種方式與 360 度照片互動？

\*互動在此意指使用手指、手、鍵盤或滑鼠任意滑動或揮動裝置畫面。

☐ 行動裝置 (手機、平板)。

☐ 電腦 (桌機、筆電)。

☐ 其他

☐ 只是靜態觀看，我沒有左右滑動或揮動裝置上的 360 度照片。

3. 請問你擁有哪一款 Gogoro？(可多選)

☐ Gogoro 2 ☐ Gogoro 1 ☐ Gogoro 3 ☐ Gogoro VIVA

☐ 我還沒擁有 Gogoro

4. 請選擇你在照片中有發現的人事物(可多選)







5. 請選擇符合以下敘述的程度

一星~三星為不同意程度、四星為無意見、五星~七星為同意程度

- a. 我能夠熟練地與這張 360 度照片互動。
- b. 我非常擅長與這張 360 度照片互動。
- c. 我能夠順利地與這張 360 度照片互動。
- d. 我的互動能力足以匹配臉書 360 度照片的功能設計。
- e. 這張 360 度照片提供我有趣的視角選擇。
- f. 我總是能在這張 360 度照片中汲取樂趣。
- g. 我純粹喜歡與這張 360 度照片互動。
- h. 我在與這張 360 度照片互動時感受到大量的自主性。
- i. 在這張 360 度照片中，我與 Gogoro 社群成員的關係是令人滿意愉快的。
- j. 在這張 360 度照片中，我與 Gogoro 社群成員的關係是值得重視的。
- k. 在這張 360 度照片中，我覺得我與 Gogoro 社群成員並不親近。

6. 請選擇符合以下敘述的程度

一星~三星為不同意程度、四星為無意見、五星~七星為同意程度

- a. 與這張 360 度照片互動完後，我覺得我從照片中的世界轉換回現實世界。
- b. 與這張 360 度照片互動時，我覺得我彷彿置身於照片創造的世界中。
- c. 這張 360 度照片創造了一個新的世界給我，當與照片互動完後，這個世界

就消失了。

- d. 與這張 360 度照片互動時，我的身體在座位上，但我卻感覺自己在照片創造的世界中。
  - e. 與這張 360 度照片互動時，照片中的世界比起當下我所在的地點更真實。
  - f. 這張 360 度照片中的世界只是我看到的一個畫面，**不算**我真實到過的地方。
  - g. 與這張 360 度照片互動時，我仍舊感覺得到的周遭事物，**而非**完全置身於 360 度照片創造的世界。
6. 請選擇符合以下敘述的程度
- 一星~三星為不同意程度、四星為普通、五星~七星為同意程度
- a. 我喜歡與 360 度照片互動。
  - b. 與 360 度照片互動很有趣。
  - c. 我覺得與 360 度照片互動是一個無聊的行為。
  - d. 與 360 度照片互動是沒意義的事情。
  - e. 我會形容與 360 度照片互動很好玩。
  - f. 我覺得與 360 度照片互動相當享受。
  - g. 與 360 度照片互動時，我能領略其中意趣。
7. 請選擇符合以下敘述的程度
- 一星~三星為不同意程度、四星為普通、五星~七星為同意程度
- a. 我計畫在未來六個月內騎乘 Gogoro 出去玩。
  - b. 我會嘗試在未來六個月內騎乘 Gogoro 出去玩。
  - c. 我會進一步尋求騎乘 Gogoro 出去玩的相關景點資訊。

d. 我願意和他人分享騎乘 Gogoro 出去玩的想法。

e. 我願意與朋友一起騎乘 Gogoro 出去玩。

f. 我想邀請朋友一起騎乘 Gogoro 出去玩。

8. 請選擇符合以下敘述的程度

一星~三星為不同意程度、四星為普通、五星~七星為同意程度

產品

a. 我喜愛我的 Gogoro 電動車。

b. 我對我的 Gogoro 電動車感到沾沾自喜。

c. Gogoro 電動車是我喜好擁有的物品之一。

d. Gogoro 電動車騎起來很有趣。

品牌

e. 我重視 Gogoro 的品牌精神。

f. 如果要汰換我現有的 Gogoro 電動車，我會再買一台 Gogoro。

g. Gogoro 擁有無與倫比的高品質。

公司

h. Gogoro 這間公司了解我的需求。

i. Gogoro 這間公司在乎我的意見。

其他消費者

j. 因為 Gogoro 社群，我認識一群美好的人們。

k. 我對於擁有 Gogoro 的人感到有親切感。

l. 因為其他 Gogoro 車主的存在，我對這個社群充滿興趣。

9. 請問你過去是否曾經在社群媒體 (例如：臉書、Google 相簿、YouTube) 上與 360 度照片或影片互動過?

不含此篇 Po 文照片。不含 Google map、看房網站。

☐ 是 ☐ 否 大約幾次？☐ 1~5 次 ☐ 6~10 次 ☐ 多於10 次

10. 請問你是否曾經在社群媒體 (例如：臉書、Google 相簿、YouTube) 上傳過  
360 度照片或影片？

☐ 是 ☐ 否 大約幾次？☐ 1~5 次 ☐ 6~10 次 ☐ 多於10 次

12. 請問你是否曾經在 Google map 或看房網站上與 360 度照片或影片互動過？

☐ 是 ☐ 否 大約幾次？☐ 1~5 次 ☐ 6~10 次 ☐ 多於10 次

13. 請問你是否曾經體驗過 VR 虛擬實境？

☐ 是 ☐ 否 大約幾次？☐ 1~5 次 ☐ 6~10 次 ☐ 多於10 次

14. 請問你是否曾經騎乘 Gogoro 到特定景點出去玩？

☐ 是 ☐ 否 大約幾次？☐ 1~5 次 ☐ 6~10 次 ☐ 多於10 次

15. 請問你騎乘 Gogoro 多久了？

☐ 低於三個月 ☐ 三到六個月 ☐ 半年到一年 ☐ 一年到二年  
☐ 二年到三年 ☐ 三年或以上 ☐ 未曾騎乘過

16. 請問你加入 Gogoro Fan Club 多久了？

☐ 低於三個月 ☐ 三到六個月 ☐ 半年到一年  
☐ 一年到二年 ☐ 二年到三年 ☐ 三年或以上

17. 請問你一個星期大約有幾天會看到 Gogoro Fan Club 的貼文？

☐ 都不會看到 ☐ 一天 ☐ 二天 ☐ 三天 ☐ 四天 ☐ 五天 ☐ 六天 ☐ 七天

18. 你的性別？

☐ 生理男 ☐ 生理女 ☐ 其他

19. 你的年齡？

\_\_\_\_\_ 歲

20. 你的居住縣市？

- ☐ 基隆市 ☐ 台北市 ☐ 新北市 ☐ 桃園縣 ☐ 新竹縣 ☐ 新竹市
- ☐ 苗栗縣 ☐ 南投縣 ☐ 台中市 ☐ 彰化縣 ☐ 雲林縣 ☐ 嘉義縣
- ☐ 嘉義市 ☐ 台南市 ☐ 高雄市 ☐ 屏東縣 ☐ 宜蘭縣 ☐ 花蓮縣
- ☐ 台東縣 ☐ 澎湖縣 ☐ 金門縣 ☐ 連江縣 ☐ 其他 (請描述) \_\_\_\_\_

21. 你的月收入大約多少？

- ☐ 無收入 ☐ NTD 15,000 以下 ☐ NTD 15,001–NTD 23,000 ☐ NTD 23,001–
- NTD 30,000 ☐ NTD 30,001–NTD 40,000 ☐ NTD 40,001–NTD 48,000 ☐ NTD
- 48,001–NTD 58,000 ☐ NTD 58,001–NTD 77,000 ☐ NTD 77,001–NTD 100,000
- ☐ 高於 NTD 100,000 ☐ 不作答

## APPENDIX C: Questionnaire (No Interactivity)

1. 在問卷正式填答開始前，請先確認你是否第一次看到此篇 Po 文的照片？

☐ 是，我要繼續作答。

☐ 否，我曾看過這張照片 360 度可互動的版本。

2. 請問你剛才在 Gogoro Fan Club 的貼文中，使用哪一種方式與 360 度照片互動？

\*互動在此意指使用手指、手、鍵盤或滑鼠任意滑動或揮動裝置畫面。

☐ 行動裝置 (手機、平板)。

☐ 電腦 (桌機、筆電)。

☐ 其他

☐ 只是靜態觀看，我沒有左右滑動或揮動裝置上的 360 度照片。

3. 請問你擁有哪一款 Gogoro？(可多選)

☐ Gogoro 2 ☐ Gogoro 1 ☐ Gogoro 3 ☐ Gogoro VIVA

☐ 我還沒擁有 Gogoro

4. 請選擇符合以下敘述的程度

一星~三星為不同意程度、四星為無意見、五星~七星為同意程度

a. 我能夠熟練地觀看這張照片。

b. 我非常擅長觀看這張照片。

c. 我能夠順利地觀看這張照片。

d. 我的能力足以匹配臉書觀看照片的功能設計。

e. 這張照片提供我有趣的視角選擇。

f. 我總是能在觀看這張照片時汲取樂趣。

- g. 我純粹喜歡觀看這張照片。
- h. 我在觀看這張照片時感受到大量的自主性。
- i. 透過這張照片，我感到與 Gogoro 社群成員的關係是令人滿意愉快的。
- j. 透過這張照片，我感到與 Gogoro 社群成員的關係是值得重視的。
- k. 透過這張照片，我覺得我與 Gogoro 社群成員並不親近。

5. 請選擇符合以下敘述的程度

一星~三星為不同意程度、四星為無意見、五星~七星為同意程度

- a. 觀看這張照片後，我覺得我從照片中的世界轉換回現實世界。
- b. 觀看這張照片時，我覺得我彷彿置身於照片創造的世界中。
- c. 這張照片創造了一個新的世界給我，看完照片後，這個世界就消失了。
- d. 觀看這張照片時，我的身體在座位上，但我卻感覺自己在照片創造的世界中。
- e. 觀看這張照片時，照片中的世界比起當下我所在的地點更真實。
- f. 這張照片中的世界只是我看到的一個畫面，不算我真實到過的地方。
- g. 觀看這張照片時，我仍舊感覺得到的周遭事物，而非完全置身於照片創造的世界中。

6. 請選擇符合以下敘述的程度

一星~三星為不同意程度、四星為普通、五星~七星為同意程度

- a. 我喜歡觀看照片。
- b. 觀看照片很有趣。
- c. 我覺得觀看照片是一個無聊的行為。
- d. 觀看照片是沒意義的事情。

- e. 我會形容觀看照片很好玩。
- f. 我覺得觀看照片相當享受。
- g. 觀看照片時，我能領略其中意趣。

7. 請選擇符合以下敘述的程度

一星~三星為不同意程度、四星為普通、五星~七星為同意程度

- a. 我計畫在未來六個月內騎乘 Gogoro 出去玩。
- b. 我會嘗試在未來六個月內騎乘 Gogoro 出去玩。
- c. 我會進一步尋求騎乘 Gogoro 出去玩的相關景點資訊。
- d. 我願意和他人分享騎乘 Gogoro 出去玩的想法。
- e. 我願意與朋友一起騎乘 Gogoro 出去玩。
- f. 我想邀請朋友一起騎乘 Gogoro 出去玩。

8. 請選擇符合以下敘述的程度

一星~三星為不同意程度、四星為普通、五星~七星為同意程度

產品

- a. 我喜愛我的 Gogoro 電動車。
- b. 我對我的 Gogoro 電動車感到沾沾自喜。
- c. Gogoro 電動車是我喜好擁有的物品之一。
- d. Gogoro 電動車騎起來很有趣。

品牌

- e. 我重視 Gogoro 的品牌精神。
- f. 如果要汰換我現有的 Gogoro 電動車，我會再買一台 Gogoro。
- g. Gogoro 擁有無與倫比的高品質。



公司

h. Gogoro 這間公司了解我的需求。

i. Gogoro 這間公司在乎我的意見。

其他消費者

j. 因為 Gogoro 社群，我認識一群美好的人們。

k. 我對於擁有 Gogoro 的人感到有親切感。

l. 因為其他 Gogoro 車主的存在，我對這個社群充滿興趣。

9. 請問你過去是否曾經在社群媒體 (例如：臉書、Google 相簿、YouTube) 上與 360 度照片或影片互動過？

不含此篇 Po 文照片。不含 Google map、看房網站。

☐ 是 ☐ 否 大約幾次？☐ 1~5 次 ☐ 6~10 次 ☐ 多於10 次

10. 請問你是否曾經在社群媒體 (例如：臉書、Google 相簿、YouTube) 上傳過 360 度照片或影片？

☐ 是 ☐ 否 大約幾次？☐ 1~5 次 ☐ 6~10 次 ☐ 多於10 次

11. 請問你是否曾經在 Google map 或看房網站上與 360 度照片或影片互動過？

☐ 是 ☐ 否 大約幾次？☐ 1~5 次 ☐ 6~10 次 ☐ 多於10 次

12. 請問你是否曾經體驗過 VR 虛擬實境？

☐ 是 ☐ 否 大約幾次？☐ 1~5 次 ☐ 6~10 次 ☐ 多於10 次

13. 請問你是否曾經騎乘 Gogoro 到特定景點出去玩？

☐ 是 ☐ 否 大約幾次？☐ 1~5 次 ☐ 6~10 次 ☐ 多於10 次

14. 請問你騎乘 Gogoro 多久了？

☐ 低於三個月 ☐ 三到六個月 ☐ 半年到一年 ☐ 一年到二年

☐ 二年到三年 ☐ 三年或以上 ☐ 未曾騎乘過

15. 請問你加入 Gogoro Fan Club 多久了？

- ☐ 低於三個月    ☐ 三到六個月    ☐ 半年到一年  
☐ 一年到二年    ☐ 二年到三年    ☐ 三年或以上

16. 請問你一個星期大約有幾天會看到 Gogoro Fan Club 的貼文？

- ☐ 都不會看到    ☐ 一天    ☐ 二天    ☐ 三天    ☐ 四天    ☐ 五天    ☐ 六天    ☐ 七天

17. 你的性別？

- ☐ 生理男    ☐ 生理女    ☐ 其他

18. 你的年齡？

\_\_\_\_\_ 歲

19. 你的居住縣市？

- ☐ 基隆市    ☐ 台北市    ☐ 新北市    ☐ 桃園縣    ☐ 新竹縣    ☐ 新竹市  
☐ 苗栗縣    ☐ 南投縣    ☐ 台中市    ☐ 彰化縣    ☐ 雲林縣    ☐ 嘉義縣  
☐ 嘉義市    ☐ 台南市    ☐ 高雄市    ☐ 屏東縣    ☐ 宜蘭縣    ☐ 花蓮縣  
☐ 台東縣    ☐ 澎湖縣    ☐ 金門縣    ☐ 連江縣    ☐ 其他 (請描述)\_\_\_\_\_

20. 你的月收入大約多少？

- ☐ 無收入    ☐ NTD 15,000 以下    ☐ NTD 15001–NTD 23,000    ☐ NTD 23,001–NTD  
30,000    ☐ NTD 30,001–NTD 40,000    ☐ NTD 40,001–NTD 48,000    ☐ NTD 48,001–  
NTD 58,000    ☐ NTD 58,001–NTD 77,000    ☐ NTD 77,001–NTD 100,000    ☐ 高於  
NTD 100,000    ☐ 不作答