INSTAGRAM'S INFLUENCE ON DIVERS' INTENTION FOR MARINE CONSERVATION BEHAVIOR

A THESIS SUBMITTED TO THE GRADUATE DIVISION OF THE UNIVERSITY OF HAWAIʻI AT MĀNOA IN PARTIAL FULFILLMENT OF THE REQUIREMENTS FOR THE DEGREE OF

MASTER OF COMMUNICATIONS

March. 2020

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Keyword: Marine conservation, Instagram, diving, intention

ACKNOWLEDGEMENT

I would like to express my gratitude toward the University of Hawai'i at Mānoa School of Communications for giving me the opportunity to do research and providing me with invaluable guidance throughout this project. I would also like to express my deep and sincere gratitude to my research advisor, Dr. Wayne Buente, and my committee members, Dr. Jenifer Sunrise Winter and Dr. Rachel Neo. Dr. Buente has taught me the methodology of carrying out the research and presenting the research information as clearly as possible. It was a great privilege and honor to work and study under his guidance. I am extremely grateful for what he has offered me. I am extending my heartfelt thanks to Dr.Winter and Dr. Neo, as well because of their acceptance and patience during our discussions on research. I am truly grateful to them for always providing much invaluable advice for my work.

I am extremely grateful to my parents for their love, prayers, care, and sacrifices in educating and preparing me for my future. Studying abroad was not a simple decision; I am very much thankful that they let me travel from Taiwan to Hawaii for my master's degree. I could not have completed this research without them. Also, I express my thanks to my brother for his support and the care that he gave to my parents while I was studying in Hawaii. My special thanks go to my friend Joe Liu for giving me a lot of suggestions when I was working on my thesis. Thanks for his genuine support throughout this research.

I would also like to say thanks to my friends Bella Congdon, Sean Congdon, John Wen, and Tzu Lin Yeh for their constant encouragement. Finally, my thanks goes out to all the people who have supported my completion of this research–directly or indirectly.

Jeng (Kuan-Chen), Chen

Abstract

The purpose of this study is to determine how divers perceive marine conservation posts on Instagram. In addition, this study explored their intention toward protecting marine conservation behavior through the use of social media, specifically focusing on Instagram and how it impacts their behavior through quantitative research. Scholars have shown that diving instruction leads to greater environmental concern. Yet, little is known about how social media contributes to the relationship between diving instruction and a diver's respect for marine conservation knowledge, attitude, and behavior. According to the theory of planned behavior (TPB), the degree of one's involvement is influenced by the attitude and conduct of the user towards the intention to participate in a social issue. This study applied a research model based on the theory of planned behavior in order to examine the relationship between diving respondents, social media, and intention. The study found that attitude, subjective norms, and perceived behavior control correlated with user intent for marine conservation efforts. The diving certification and frequency of seeing marine conservation posts on Instagram also contributed toward positive consideration for the marine environment.

Table of Contents

List of Tables

List of Figures

Chapter 1 Introduction

Why protect the ocean? People need breathable air, drinkable water, edible food, and a climate in which humans can draw on its beauty, inspiration, and leisure. Humans need to know that we belong to something greater than ourselves. Humans want those they care about to have a better future and need healthy oceans to survive and thrive. Therefore, marine conservation is an important social issue of our time. Marine environmental awareness has shown to be a significant factor in marine conservation behavior prediction (Thapa, Graefe, & Meyer, 2005).

The ocean is Earth's leading ecosystem. It is the biggest life support system on the planet. The ocean generates half of the oxygen that we breathe and at any given time and comprises more than 97% of the world's water. One-sixth of the protein that humans consume comes from the ocean. The ocean absorbs atmospheric carbon dioxide and decreases the effects of climate change. The variety and productivity of the ocean is a crucial human interest. Our safety, economy, and very survival all depend upon healthy oceans (Why we protect the ocean, n.d.).

Rokicka (2002) discovered that ecological awareness and education at elevated concentrations had a powerful impact on environmentally accountable behaviour. However, marine conservation does not attract adequate public attention. According to Abreo and their colleagues (2019), information collected from social media and citizen science can be a significant instrument for addressing gaps in understanding regarding the absence of continuous systematic specialist recording of marine conservation instances. In addition, social media enabled scientists to confirm species identification in some strandings and offered helpful baseline information on the effects of marine litter on various marine species.

Furthermore, NOAA researchers (2019) used social media to track human activity around endangered monk seals in Hawaii. Scientists Mark Sullivan, Dr. Stacie Robinson, and Dr. Charles Littnan tracked the hashtag #monkseal on Instagram. They discovered that human upheaval is more normal than they thought. Platforms of social media can be an important platform for wildlife science and conservation programs. When users post animal images and videos, scientists are able to access that data in real-time. Scientists track them for information on animal activity, behavior, and survival risks. Some environmental projects will benefit from related work in complementing their research and development efforts using social media. This study shows that Instagram has the potential to contribute to marine conservation.

The literature review conducted for the study determined that there is a lack of research exploring the link between domestic diving and environmental conservation. Researchers collected literature and found that domestic diving and environmental conservation promotion did not have adequate research. The current study provided data for diving, marine knowledge and other environmental conservation-related fields. In addition, the study explored how leisure divers examine their own connections between marine environment knowledge. The greater implementation of environmental educational activities has made more people aware of marine conservation and has captured the interest of the academic community as an object of study. Overall, this has helped people to value the importance of personal knowledge and behavior for marine conservation and work for peace with nature to enable every species on earth to survive.

Chapter 2 Literature Review

2.1 Diving as a Unique Activity

Diving tourism has been marked by rapid growth in the last 15 years, and several million active divers are now estimated worldwide. (e.g. World Tourism Organization (WTO), 2001). Diving as a recreation activity has been shown to deliver significant emotional and sensorial experiences related to weightlessness and a heightened sense of awareness of underwater space (Merchant, 2011; Strandvad, 2018). However, diving has also created increasing pressure on the marine environment in a variety of dive destinations. Divers are not the only cause of environmental change in marine ecosystems, but they can be significant factors in the disruption and destruction of them, as is stated in numerous publications. (e.g. Barker & Roberts, 2004; Hawkins & Roberts, 1993; Hawkins et al, 1999; Shackley, 1998; Tratalos & Austin, 2001; Zakai & Chadwick-Furman, 2002).

2.2 Environment

One of the world's major conservation issues is the universal decrease in coral reef health (Bellwood et al. 2004). Despite many global and regional coral reef conservation initiatives, the conditions of coral reefs in recent decades have changed for the worse. During the Seventh International Coral Reef Symposium in Guam in 1992, coral reef scientists estimated that 10 percent of the world's reefs were already lost. It was also estimated that 30 percent were in a critical state and predicted to be lost without efficient management in the next 10-20 years, and another 30 percent were threatened with potential destruction in the next 20-40 years. Nevertheless, the picture was more than evident in the 2000 study of the Global Coral Reef

Monitoring Network (GCRMN) (Wilkinson, 2000): the state of coral reefs continued to worsen, mainly as a result of the devastating bleaching event in 1998. In this event, 16 percent of the world's reefs were lost in just nine months. The reefs that had the most damage were in the Wider Indian Ocean with an average of 46 percent of their area in a damaged state.

2.2.1 Environmental Education

Environmental education is described as a way to rethink our biosphere relationships and an instruction for social change towards sustainable development (Colom and Sureda, 1981). The term 'environmental education' is used to provide more formal, behavior-changing data. Sharing this data could reduce the use of resources at home and avoid hitting corals on a dive. From an academic standpoint, the term ' learning' is defined as a fairly formal process of providing information to those who lack it. Many people believe that environmental education has the ability to change people's environmental conservation behavior. Yet, many years of academic and behavioral research (Bell, Greene, Fisher & Baum, 1996) demonstrate that relevant information is a necessary part of communication aimed at promoting change in behaviour, but it also needs to coincide with an emotional experience and an opportunity to quickly put into practice new understanding and skills. Giving someone abstract information about environmental impacts and their role in minimizing them may create good intentions, but these may be quickly forgotten if an opportunity to put them into practice is not provided (Brylske, 2000; Manfredo & Bright, 1991; Orams, 1994, 1997; Veitch & Arkheim, 1995).

Interpretation and environmental awareness can help environmental managers and dive businesses to accomplish two goals:

- Minimize the impact of other divers on the marine environment during their trip when not diving (such as the fish they eat, the souvenirs they purchase, etc.) (Townsend, 2008).
- Increase the engagement and support of divers to marine preservation, both now and in the future (Townsend, 2008).

Another key part of interaction aimed at promoting behavioral change is to give people an opportunity to act on the information given to them. Ads are often going to tell you to "call now" to get a deal or buy a product because they know their message will soon be forgotten and they need to catch you right away. The message is more likely to stick if a person confirms new knowledge with action immediately after receiving a message (Manfredo & Bright, 1991, Orams, 1994, 1997; Veitch & Arkheim, 1995). This ensures diving education has an inherent advantage over other environmental education programs because it conveys environmental messages with the goal of improving behaviour.

2.3 Increasing Enjoyment and Broder Commitment to Conservation

According to Townsend (2008), small group sizes and experience help add value to a dive as well as increase the enjoyment of the dive for the clients. Increasing the enjoyment of a dive for clients is vital for both diverse businesses and conservationists to succeed. If they enjoy visiting a site, divers are more likely to be willing to take action towards its protection. Such action might include paying more to visit sites, donating money for its protection, giving time as a volunteer for activities such as surveys or beach cleanups, and responding positively to other environment-related messages both while on holiday and when they go home. For example,

visitors can refuse to buy endangered species, not eat shark fins and use litter bins. In addition, long-term dedication to environmental protection and actions such as joining marine conservation groups and using environmentally safe household products after returning home will also benefit the environment.

2.4 Diving Education Impact

The main focus of this research is the divers' behavior online and offline. Diving is a great market in the world with as many as 6 million active divers globally and between 2.7 and 3.5 million active divers in the US ("Diving Market", 2016). Given the increase in diving activities and the significance of environmental education programs, mitigating potential effects on coral reef habitats, marine species, and the diving community is the most crucial task (Thapa, Graefe, & Meyer, 2005). Townsend (2000) discovered greater rates of environmental knowledge and consciousness among experienced divers decreased the damage to the marine environment.

The global diving industry is organized by various international umbrella organizations such as the Professional Association of Diving Instructors (PADI), the National Association of Underwater Instructors (NAUI), Scuba Schools International (SSI), and the Confédération Mondiale des Activités Subaquatiques (CMAS), as well as its international and regional branches. According to Lindgren, Palmlund, Wate and Gössling (2008), dive organizations may typically encourage environmental awareness, e.g. on their websites and in their marketing materials, by emphasizing the critical state of marine environments, and by engaging their members in environmental actions. In the curricula of both dive instructors and divers, dive organizations can also integrate environmental issues. This goal can be achieved by various

measures and at several educational levels. First, it is possible to address the need for environmental action in general in diver education. This can make the dive organization leaders aware of the need for action. Second, dive instructors and divers ' personal environmental awareness will help minimize impacts because divers may understand what actions cause damage to habitats and can try to avoid them. A diver with more ecological awareness is also likely to be more interested in proper behaviour (Cottrell & Meisel, 2004). Finally, reducing the damage caused by divers in marine ecosystems will require practical skills, such as the ability to maintain buoyancy (Lindgren, Palmlund, Wate and Gössling, 2008). For example, divers with poor buoyancy control skills can significantly harm the underwater environment by crashing into coral. Weak finning techniques also stir up silt and sand at the bottom of the ocean, destroying marine species (Fishman, 1991). Experienced divers with better control of buoyancy and proper techniques of finning can mitigate their effect on coral reefs. The degree of actual impact is largely influenced by the level of scuba divers experience and behavior, as diving requires no physical contact with the reef (Rouphael & Inglis, 1997). Besides technical skills (e.g., skill level), environmental awareness and attitudes about coral reef habitats are instrumental in minimizing effects and encouraging environmentally accountable behaviors (Thapa, Graefe, & Meyer, 2005).

2.4.1 Empirical studies on Diving and the Environment

Understanding and pro-environmental orientations are directly related to the level of experience that affects the level of skill. According to prior research on scuba diving students, approximately 54 percent reported frequently watching TV programs about the environment,

ocean life, or conservation; 43 percent reported reading books or magazines on environmental issues; and 72 percent barely or never participated in community beach clean-up efforts (Thapa, Graefe, & Meyer 2005). Generally, participants stated they engage responsibly in the marine environment based on self-reported behaviours. However, the study demonstrated that the effects of specialization in diving were knowledge-related, as divers with greater levels of expertise tended to have a greater knowledge of the marine environment.

Another study evaluates diver activity (e.g. time spent in each habitat), usage (substrate contacts) and immediate effects of diver interaction on benthic organisms in Sicily's marine protected area (Cañellas & Negre, 1981). Within seven subtidal habitats, intentions of 105 divers were observed over a two-year period: algae on horizontal substrates, algae on vertical substrates, Posidonia oceanica, encrusted walls, caves, sand, and pebbles. The study found that identifying diving effects in various environments would allow management strategies to directly monitor this impact on a habitat level, such as limiting the beginning of the dive to low vulnerability habitats will minimize risk to benthic species, allowing for safe use of marine protected areas.

Dearden et al. (2007) demonstrate how SCUBA diving can help both destroy and restore the coral reef. Authors found in their research divers who have seen damage are more likely to feel that diving has a negative impact on the coral than divers who have not seen impacts. Divers were also more likely to be involved in a campaign to protect the coral. The findings affirm the potential for diving as a positive force for the protection of the reef but also show the need for increased investment in diver education.

Though there have been empirical studies on diving and the environment, there has been little research on social media's influence on divers' online and offline conservation behavior. For the study, the research examined how divers engage with marine conservation posts on Instagram in relation to offline behavior after having diving course experiences.

2.5 Social Media Influence - Instagram

In the 1990s, the term "social media" arose in relation to computer and Internet technology growth (Cao & Hong, 2011). In recent years, social media has become an essential platform for sharing information sources globally. It is one of the important sources with information on human-nature interactions (Toivonen et al., 2019). Social media facilitates the creation and sharing of information, concepts, audience interests, and other forms of expression via interaction communities and networks which are interactive computer-mediated technologies (Kietzmann, Jan H.; Kristopher Hermkens, 2011). Depending on the platform and user preferences, personal accounts and messages may be private or public (Lange, 2007). On social media platforms, each user can share their life experiences. Social media is not only for browsing content but also used for shopping and even for charity and environmental conservation. It includes a myriad of interactions that have value beyond personal life.

In addition, public consciousness that affects human feelings, attitudes, understandings, and beliefs is strongly linked to the conservation of the environment (Gadenne et al., 2009). Furthermore, according to Thapa et al.(2005), their findings demonstrate underwater photography is the most common activity in relation to divers. This study will focus on the visual focus platform - Instagram, which is the latest in a complex media history that has influenced a

variety of social activities (Macdowall & Souza, 2017). Instagram is presently the world's most famous social media app for youth, 70% of individuals aged 12 to 24 are using Instagram (Huang & Su, 2018). The pictures posted by individuals are almost always accessible to the public. Most pictures are taken, filtered, and published from a single mobile device. An individual's Instagram feed offers a distinctive perspective of their daily operations (Golbeck, 2015). Below is the history, development, and mechanics of Instagram:

2.5.1 A Brief History of Instagram

In 2010, Instagram was launched by Kevin Systrom and Mike Krieger as a free iPhone application designed to share images with friends (Instagram, 2015b). A portmanteau of "instant", "camera", and "telegram", Instagram was conceived by its developers to create a "world more connected by images" (Instagram, 2015a). In addition to connecting people, Instagram offers its users three specific benefits: 1) enhancing the 'mediocre' appearance of mobile phone images through filters, 2) enabling instant photo sharing through multiple platforms, and 3) improving the speed and ease of photo uploading (Instagram, 2015a).than Users of social media became open to the Instagram model quickly. By October 2010, one million users had entered the site, rising by September 2011 to ten million users (Instagram, 2016). This popularity drew Facebook's attention, and in April 2012, they acquired Instagram for $1 billion (Metz, 2014). Instagram has continued to grow in user base and popularity since it was launched. Instagram has been improved since 2010 including: new filters, application software for a greater number of mobile operating systems (most notably Android in 2012), photo maps showing user posts by location, tagging of other accounts in an image, the ability to upload 3-60

second videos, direct messaging, the ability to use emojis as searchable hashtags, and horizontal and vertical photos. Throughout 2015, Instagram also launched new marketing tools to build sponsored posts, including a 'Buy Now' button and a new advertising API (application programming interface) (Sloane, 2015). The most recent changes to Instagram were the move to an algorithm-based feed and the introduction of the Instagram Stories feature inspired by Snapchat (Instagram, 2016). Each of these changes were guided by current usage trends, market demands, and developer social contexts and further re-configured Instagram's architecture, creating new user-friendly opportunities (Laestadius, 2016).

2.5.2 Instagram as a Unique Platform

As “differences in visual offerings lead to differences in group behavior” (Baym, 2015), it is important to recognize that Instagram should not simply be viewed as Twitter with images and a cap of 2,200 characters. Dubois and Ford (2015: 2071) explain this well as they point out that “tweet is not the same as a Wikipedia update, which is still different from a Facebook comment,” and that each has to be interpreted differently. While the use of other platforms as a methodological reference point is tempting, especially given the shared hashtag architecture (Highfield and Leaver, 2014), this may obscure some of Instagram's unique features and application aspects. That said, in this sense, researchers with projects on other sites will almost definitely approach Instagram. It is worth explaining the features and characteristics of Instagram through a review of key differences between Instagram and its most conceptually similar counterparts: Twitter social networking site, and Flickr image sharing system.

2.5.3 Instagram as a Visual Social Media

Instagram is a form of photographic and visual communication. The content on Instagram privileges a visual form of communication. Research on Instagram has shown that visual communication helps to build brand presence (Carah & Shaul, 2016), develop photographic storytelling (Serafinelli, 2018) and encourage networked photography (Lobinger, 2016). Although the amount of active users on Facebook exceeds two billion in June 2017 (more than a quarter of the world's population), its use among younger individuals is decreasing considerably. In contrast, the visual nature of Instagram is forecast to grow 23.8 percent during this same period, most of whom are young individuals and, in 2018, Instagram is forecasted to achieve 8.5 million users (Motives for Instagram Use, n.d.).

Hashtags

Instagram hashtags are prevalent. As with Twitter and other locations, to view other pictures with the same hashtag, hashtags can be clicked on. Since Instagram pictures are generally public— and they are usually viewed by the society as publicly shared pictures (instead of, say, communications with their friends)—hashtags are a way for somebody's pictures to reach a larger crowd than their own supporters. Having a dozen or more hashtags on a picture is not unusual. This won't always tell you a lot about the individual posting the picture, but it will tell you which communities they like to communicate with on Instagram (Golbeck, 2015).

Story

Within the Instagram app, Instagram Stories is a feature where users can capture and post related images and video content in a slideshow format. With the typical features of the popular social media app, stories can be modified (Dearden, Bennett, & Rollins, 2007). After 24 hours, photos or videos posted to the Story account disappear. Publishing a photo or video as a story post can be useful to document an event in real time with photos and videos you do not want to clutter your profile in the future.

Swipe up

Swiping up is an action in Story, it means drawing attention to the bottom of the screen. Users can swipe up and gain more information or lead to other websites, such as an environmental organization official website, beach cleanups reservation form, YouTube channel, or conservation events and so on.

Mentions

When inserting another user's @mention (i.e. the username of the addressee following the' @' symbol), it becomes possible to highlight the user's particular response. @mentions can therefore be seen as attempts to engage another client in a conversation (Bruns & Moe, 2014). This is one of the essential actions on Instagram. Users use the @ symbol to mention their friends, organizations, or other accounts, which means more people will see the post.

2.6 Communication Technology and Environment

In a previous study, researchers explored the usefulness of social media in offering information for inventory and spatial distribution of marine species adversely impacted by litter (Abreo, Thompson, Arabejo, & Superio, 2019). The study used qualitative research to complete the content analysis for Facebook as a source of data on marine litter in the Philippines. In its results, the study demonstrates information collected from social media and citizen science can be a significant instrument for addressing gaps in understanding owing to the absence of continuous, systematic specialist recording of marine litter instances. Besides, social media also enabled scientists to confirm species identification in some strandings and offered helpful baseline information on the effects of marine litter on Philippine marine species. The technique used has intrinsic constraints, but it is suggested that a number of cost-effective improvements could be made that will allow scientists and organizations to exploit social media's complete potential.

In another study, internet news and associated government commentaries were gathered and assessed on the Indo-Pacific humpback dolphin (Sousa chinensis), one of China's flagship species, to determine the efficiency of media news releases in enhancing public consciousness (Wu, et al. 2018). Authors used data collection and analyzed contents to discover the consequences of the research. The results show more attention is required to depict and deliver conservation understanding (e.g., rescue techniques, biological characteristics), adverse impacts of varied human behaviors on wildlife, and comprehensive correct descriptions to foster public

understanding of wildlife conservation using multi-faceted thinking to decrease public confusion among policymakers and professionals. A concerted framework could assist through social media to reinforce wildlife management.

Another study discussed water conservation education on social media (Hove & Osunkunle, 2019). It focused on local municipalities in the Eastern Cape Province's Amathole District, which was declared a high-risk area due to the 2016-2017 drought. The Government to Citizen Model (G2C) has been used to support participation as a theoretical framework. Purposive sampling was used, with priority being given to water messages. Evaluation of quality content was used to analyze content on social media platforms of local municipalities. The only social media platform used for this research was Twitter and Facebook. Researchers found that local municipalities in Amathole District did not use social media platforms for participatory water conservation training, excluding the district municipality.

As previously stated, there is a research gap on how social media influences a diver's online conservation behavior. More specifically, there has not been a study conducted that has examined the visual communication platform Instagram and its ability to influence diving course participants' environmental behaviors. The literature review conducted found there has been a focus on the divers' experience level, and how many courses they took, but not any connection with their behavior on social media and their environmental awareness. In order to better understand the link between diving education, social media use and environmental behaviors, the study draws on the theory of planned behavior as a theoretical framework.

2.7 Theoretical Background - Theory of Planned Behavior

Environmental behaviors from different theoretical models have been studied. The theory of planned behavior (TPB) emphasizes the attitude-related aspects of behaviour, while the environment-related value-belief-norm model focuses on the significance of ethical elements when setting environmental behaviour (Aguilar-Luzón, García-Martínez, Calvo-Salguero, & Salinas, 2012). In addition, many authors believe that using the TPB as a framework for the study of environmental behavior can explain both intention and future behaviour. (e.g., Bamberg, Ajzen, & Schmidt, 2003; Boldero, 1995; Hwang, Kim, & Jeng, 2000; Kaiser, Hübner, & Bogner, 2005; Kaiser, Wölfing, & Führer, 1999; Mannetti, Pierro, & Livi, 2004, among others).

TPB suggests that by aligning psychological beliefs, human behaviors can be predicted. These include a stance towards a particular object (attitude), the belief that others will approve an action toward that specific object (subjective norm), self-effective beliefs toward an outcome (perceived behavioral control), and willingness to carry out that action (intention; Ajzen, 1991; Armitage & Conner, 2001).

According to the study by Ajzen (1991), behavioral attitudes, subjective behavioral norms, and perceived behavioral controls are usually found to predict behavioral intentions with a high degree of accuracy. Besides, a central factor in the planned behavior theory is the intention of the individual to perform the behavior in question. The theory of planned behavior traces attitudes, subjective norms, and perceived behavioral control to an underlying foundation of beliefs about the behavior.

Attitude focuses on the degree to which an individual has conducted evaluation which is favorable or unfavorable. This component involves behavioral beliefs variables, i.e., emotions about the actual action and assessments of the result, or the expectation that the action will make a difference.

Subjective norms and perceived behavioral control are also important components of the TPB model. Subjective norms refers to perceptions of social pressure to act and involves indicators of normative values as well as personal incentive to act accordingly. In addition, the significance of actual behavioral control is self-evident: a person's resources and opportunities must dictate the likelihood of behavioral achievement to some extent. However, the perception of behavioral control is of greater psychological interest than actual control and affects intentions and actions.

Howell, Shaw, & Alvarez (2014) demonstrate the value of subjective norms and perceived behavioral control in their examination of Aquatic invasive species (AIS), AIS, which are non-native plants or animals that pose a threat to environmental and economic life, are mainly caused by boaters and anglers traveling between bodies of water. Research indicates that interaction with these individuals within their social networks, through opinion leaders, can promote change in attitude and actions. The theory of planned behavior discussed factors that can improve AIS outreach behaviors among opinion leaders to interact with their clients, including bait shop owners and their employees. The findings of this study indicate that expectations of conventional social pressures (i.e. subjective norms) were a strong predictor of willingness to participate in outreach programs, but perceived regulation of conduct (i.e. PBC)

was a stronger predictor of actual interaction with their clients. The study evidences the theory of planned behavior as outlining the significant factors to predict and contribute to protecting the environment. See Figure 1 below for the TPB model.

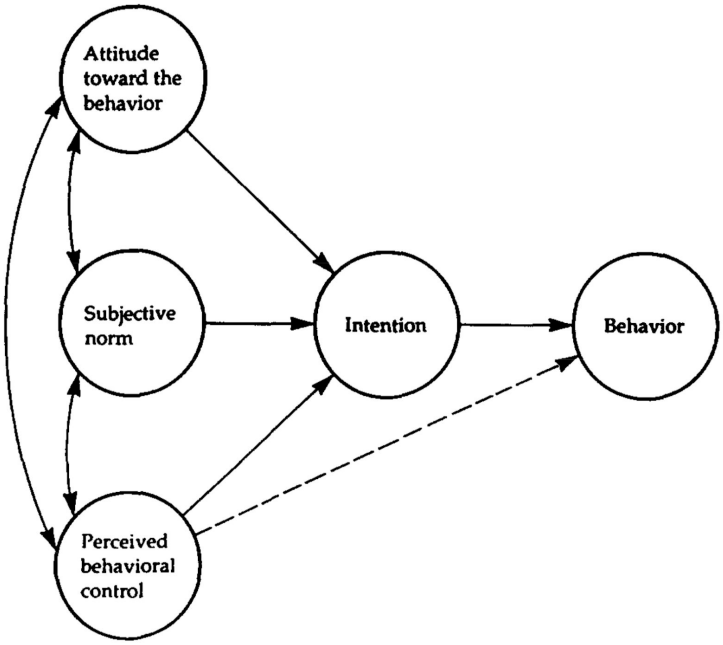

Figure 1. Theory of Planned Behavior (Ajzen, 1991)

According to Clark et al. (2019), 267 nature-based tourists from Australia and Tonga, who completed a whale watching / swim experience, were surveyed on their pro-environmental intentions, particularly regarding plastic use. A framework of theory of planned behavior (TPB) was used which incorporated moral norms and environmental identity to measure intentions to engage in pro-environmental behavior. The results found that the ability to predict pro-environmental behavior was significantly increased by including moral standards in the TPB model. In addition, environmental identity clarified another 15 percent of the pro-environmental

intentions of tourists while adjusting for the TPB and moral standard variables. The findings suggest that in a marine conservation context, the original TPB model may be less suitable. Collectively, positive experiences based on nature, environmental identity, and moral standards are important in understanding the intentions of tourists to engage in sustainable behaviors (Clark, Mulgrew, Kannis-Dymand, Schaffer, & Hoberg, 2019).

A strong predictor of subsequent behavior is the intention to engage in the behavior (Nigbur, Lyons, & Uzzell, 2010). One study used the TPB model to research predictors of public pro-environmental behavioral intentions in Singapore (Ho, Liao, & Rosenthal, 2014). Ho and colleagues examined the effects of attitude, subjective standards, perceived behavioral control (PBC), media dependence, traditional media attention, Internet attention, and interpersonal communication on two types of pro-environmental behaviors (PEBs) — green-buying and environmental civic engagement. Regression analysis of a nationally representative adult Singaporeans survey (N= 1168) showed that green-buying was positively associated with attitude, PBC, media dependency, traditional media attention, and interpersonal communication. The influence of media dependence on green-buying behavior was moderated by traditional media attention as well as interpersonal communication. However, behavior, concise norms, media reliance, access to the Internet, and interpersonal interaction positively predicted civic engagement with the community. Findings suggest the significance of factors of interaction in the two PEBs being implemented.

The theory of planned behavior has been widely used to examine how people consider environmental attitudes, subjective norms and behavioral control contributes to both intention

and/or behaviors for environmental conservation. In the past, most of the studies to date have focused almost solely on assessing the adverse effects of diving (e.g., Zakai & Chadwick-Furman, 2002) rather than a more extensive approach that also takes into account possibly beneficial effects. Furthermore, this research applies the theory of planned behavior to explore divers' behaviors and attitudes on the social media platform - Instagram. Figure 2 below displays the research model based on the theory of planned behavior.

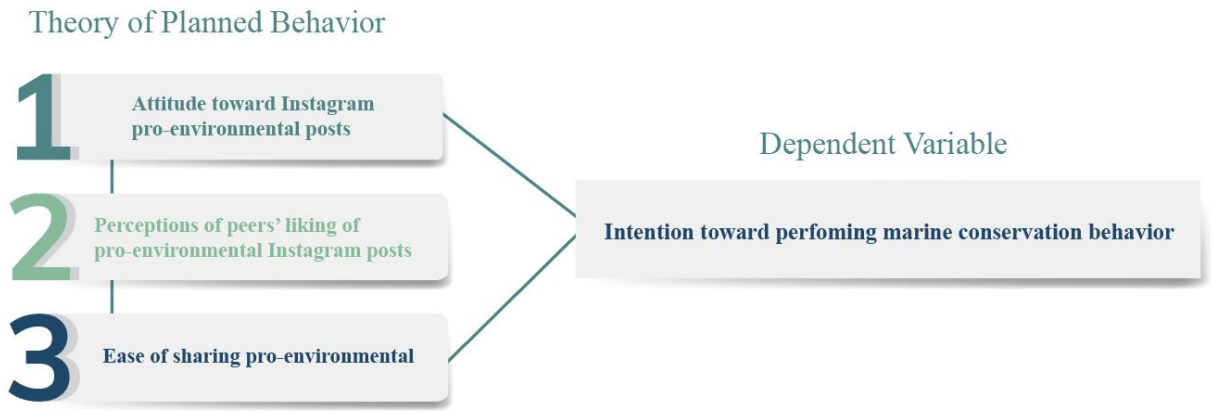

Figure 2. Research Model

The following research question is addressed in this study:

How do marine conservation posts on Instagram influence divers' intention to perform marine conservation behavior?

Based on the theory of planned behavior, the following hypotheses are proposed:

- **H1:** Divers' attitudes toward marine conservation Instagram posts will be positively associated with the intention to perform marine conservation behaviors (Attitudes).
- **H2:** Divers' perceptions of peers' liking of marine conservation Instagram posts will be positively associated with the intention to perform marine conservation behaviors (Subjective norms).
- **H3:** Divers' ease of sharin marine conservation Instagram posts will be positively associated with the intention to perform marine conservation behaviors (Perceived behavioral control).

Chapter 3 Method

3.1 Procedures

This study applied a quantitative research approach by using an online survey to observe how divers view marine conservation content on Instagram after having diving class experiences. For the online survey, two language versions were created for different language respondents:English and Mandarin. Data collection for this study took place from January 2020 until February 2020, which was approximately a one month period. Furthermore, this study explored the divers' behavior on social media–specifically focusing on Instagram and how it impacted their marine conservation actions through quantitative research. The survey used the likert scales to measure data.

3.2 Study Sample

Respondents were recruited through the social media platform Instagram from January to February of 2020. Recruitment occured via the author's personal Instagram account, the diving instructors' Instagram account, the diving group association, word of mouth, and through those who chose to share the survey. The study was done using snowball sampling as a non-probability sampling technique (DeFranzo & Bernard, 2019). Respondents were invited to complete a Qualtrics online survey, regardless of whether or not they had an Instagram account. To avoid confusion between those with and without Instagram accounts, the survey included a question that asked respondents whether or not they had an account on the site. If respondents chose

"No," it would lead them to the end of the survey. A total of 492 people participated in the online survey and, of those, 266 met the study criteria. This means that those 266 respondents who had a diving certification also used Instagram to look into marine conservation posts. The final dataset consisted of 179 women and 87 men. Women were a majority of the respondents with a ratio of two women for every one male respondent. The majority of respondents were between 25 and 34 years old (n=177, 66.5%) and had obtained a bachelor's degree (n=189, 71.1%).

3.3 Measures

The independent variables measured by this study utilized the three predictors of the theory of planned behavior model, the diving certification of the respondent, the frequency of the respondent's Instagram use, and the exposure to Instagram marine conversation content and socioeconomic variables. The dependent variable explores the intent of doing marine conservation activities. These are outlined below.

3.4 Control and Independent Variables

A set of variables were examined to understand the respondent's diving background, use of Instagram, exposure to Instagram marine conservation posts, theory of planned behavior predictors, and socioeconomic status. Next, the study discussed the control and independent variable measures.

3.5 Control variables

Diving background

Overall, the survey sampled primarily beginning and intermediate divers with a majority of respondents diving less than 20 days per year (n=177, 66.5%) and two years or less of diving experience (n=210, 78.9%). Regarding diving certification, over 85% of the respondents were certified at the beginning (Lv1 Freediver or Lv2 Freediver or OW Scuba Diver, n=176, 66.2%) or intermediate level (Lv3 Freediver or AOW Scuba Diver, n=57, 21.4%). (See Table 1). In order to assess the diving experience of the respondents, the study asked the respondent's level of diving certification. Diving was understood to be both freediving and scuba diving.

Instagram use and exposure to marine conservation

To determine the use of Instagram, two of the survey's questions asked about the user's frequency of using the app, and the frequency of which they see marine conservation posts. Respondents showed that they are active on Instagram with a vast majority of the respondents using the visual social media platform everyday (n=249, 93.6%). In addition, many survey respondents observed marine conservation posts at least 2-3 times a week (n=225, 84.6%).

Table 1 *Certified Divers as Instagram Users (N=266)*

Variable	Frequency	Percent
Demographics		
Gender		
Female	179	67.3
Male	87	32.7
Age		
18-24	72	27.1
25-34	177	66.5
35-44	10	3.8
45-54	6	2.3
55 and over	1	0.4
Education		
Less than a high school diploma	2	0.8
High school degree or equivalent (e.g. GED)	16	6.0
Some college, no degree	20	7.5
Bachelor's degree (e.g.BA, BS)	189	71.1
Master's degree (e.g. MA, MA, MEd)	38	14.3
Doctorate (e.g. Ph.D)	1	0.4
Levels of Diving Certification		
Lv1 Freediver, Lv2 Freediver or OW Scuba Diver	176	66.2
Lv3 Freediver or AOW Scuba Diver	57	21.4
Lv4 Freediver or Rescue Scuba Diver	8	3.0

Diver Master Scuba Diver or Freediving Assistant Instructor	7	2.6
Scuba Diving Instructor or Freediving Instructor or Up	18	2.6
Frequency of Instagram Use		
1 time per week	3	1.1
2-3 times per week	9	3.4
4-6 times per week	5	1.9
Everyday	249	93.6
Frequency of Seeing Marine Conservation Instagram Posts		
Never	16	6.0
1 time per week	25	9.4
2-3 times per week	62	23.3
4-6 times per week	51	19.2
Everyday	112	42.1

3.6 Independent variables

Theory of planned behavior variables

This section was formulated to assess each component of the theory of planned behavior model: attitude, subjective norms, and perceived behavioral control. Respondents were asked to choose the number that best describes their personal opinions on the following measures. Summary statistics for all theory of planned behavior measures are provided in Table 2.

- Attitudes: To evaluate the users' attitudes toward online behavior, three questions were asked about their emotions upon seeing marine conservation posts on Instagram. They were urged to rate their opinions on a seven item index likert scale. Response scales ranged from 1=bad to 7=good, 1=Unimportant to 7=very important, and 1=Unpleasant to 7=Pleasant (Shute, Wang, Greiff, Zhao, & Moore 2016). Higher scores indicate favorable attitudes toward marine conservation Instagram posts. The attitude scale showed strong internal reliability (Cronbach's α=0.90, mean = 6.72, SD= 0.62, Max = 7). The attitude index was on the high end of the scale.
- Subjective norms: To test the respondents' perceived norms on Instagram, a four item index used a likert scale to measure their agreement on the following statements (1=strongly disagree, 5=strongly agree) in relation to other people. Examples of statements that were rated include: "My friends want me to "like" marine conservation posts on Instagram"; "My friends want me to "share" marine conservation posts on Instagram"; "My friends want me to "tag" them in marine conservation posts on Instagram" and "My friends believe that sharing marine conservation posts on Instagram would help marine conservation efforts" (Shute, Wang, Greiff, Zhao, & Moore 2016). Higher scores indicate greater perceptions of respondents regarding of their peers' liking of marine conservation Instagram posts. This measure showed good internal reliability (Cronbach's α=0.84, mean = 4.55, SD=

0.55, Max = 5). Subjective norms scale was high ranking at the top of the scale measures.

- Perceived behavioral control: To determine the respondents' perceived behavioral control, a number of questions asked about their agreement to (1=strongly disagree, 5=strongly agree) "I can make a positive impact on the environment by sharing marine conservation posts on Instagram"; "I have time to share marine conservation posts on Instagram" and "I have resources to share marine conservation posts on Instagram". Higher scores on the three item index indicate respondents' ease of sharing marine conservation Instagram posts. This index has adequate internal validity for this sample (Cronbach's α=0.77, mean=4.66, SD= 0.46, Max = 5). Similar to attitudes and subjective norms, the behavioral intentions scale was also on the high end of the scale.

3.8 Dependent Variable

To measure the respondent's intention to engage in marine-related marine conservation behavior, a four item scale was created. Respondents indicated their agreement with statements (1=strongly disagree, 5=strongly agree) related to donating to environmental causes, participating in beach cleanups, using eco-friendly products and understanding marine conservation laws and regulations. Higher scores indicate respondents' intentions to engage in

future marine conservation behavior. The scale demonstrated good internal reliability (Cronbach's α=0.79, mean = 4.71, SD= 0.39, Max = 5). The results demonstrate that the diving certified survey respondents had a strong connection to marine conservation content on Instagram. Respondents also agree that intentions toward environmentally conscious behavior are important in their everyday life.

Chapter 4 Findings

4.1 Theory of planned behavior and Instagram

The theory of planned behavior (TPB) model predicts that attitudes, subjective norms and PBC significantly contribute toward behavioral intentions. This study applied the theory of planned behavior model toward understanding how Instagram contributes to environmental action. To that end, three hypotheses based on the TPB answer the research question. It is noted that diving course respondents' attitudes toward marine conservation Instagram posts would predict the intention to perform marine conservation behavior (hypothesis one). In addition, hypothesis 2 anticipated that diving course respondents' perceptions of peers' liking of marine conservation Instagram posts would be significantly, positively associated with the intention to perform marine conservation behaviors. Also, hypothesis 3 anticipated that diving course respondents' ease of sharing marine conservation Instagram posts would be significantly, positively associated with the intention to perform marine conservation behaviors.

Table 2 *Summary Statistics for Theory of Planned Behavior Measures (N=266)*

Variables	Mean	SD
Attitudes toward Intentions (Cronbach's alpha = 0.90)	**6.72**	**0.62**
For me, marine conservation posts on Instagram are ... Bad - Good[1]	6.73	0.67
For me, marine conservation posts on Instagram are ... Unimportant – Important[1]	6.77	0.62
For me, marine conservation posts on Instagram are ... Unpleasant – Pleasant[1]	6.65	0.75
Subjective norms (Cronbach's alpha = 0.84)	**4.55**	**0.55**
My friends want me to "like" marine conservation posts on Instagram.	4.64	0.59
My friends want me to "share" marine conservation posts on Instagram.	4.56	0.66
My friends want me to "tag" them in marine conservation posts on Instagram.	4.38	0.76
My friends believe that sharing marine conservation posts on Instagram will help marine conservation efforts.	4.62	0.63
Perceived Behavior Control (Cronbach's alpha = 0.77)	**4.66**	**0.46**
I can make a positive impact on the environment by sharing marine conservation posts on Instagram.	4.53	0.62
I have time to share marine conservation posts on Instagram.	4.73	0.51
I have resources to share marine conservation posts on Instagram.	4.71	0.52
Behavioral Intentions (Cronbach's alpha = 0.79)	**4.71**	**0.39**
In the next few months, I intend to donate to marine conservation causes.	4.44	0.69
In the next few months, I intend to participate in a beach cleanup.	4.75	0.52
In the next few months, I intend to learn more about marine conservation laws.	4.70	0.53
In the next few months, I intend to use eco-friendly products.	4.84	0.40
In the next few months, I intend to be involved in activities by dive shops that value marine conservation.	4.80	0.49

Note: Unless otherwise indicated, scale ranges from 1 = Strongly Disagree to 5 = Strongly Agree
[1]7 item index

4.1.1 Attitudes toward Intentions. It was hypothesized that diving certified respondents' attitudes toward marine conservation Instagram posts would be positively associated with the intention to perform marine conservation behaviors. Correlation analysis in Table 3 shows a significant positive correlation ($r(266)=0.362$, $p<0.001$) between attitudes toward Instagram marine conservation posts and intentions to engage in marine conservation behavior.

4.1.2 Subjective norms. It was hypothesized that diving certified respondents' perceptions of peers' liking of marine conservation Instagram posts would be positively associated with the intention to perform marine conservation behaviors. As shown in Table 3, a significant positive correlation between subjective norms and the intention to engage in marine conservation behavior was observed ($r(266)=0.480$, $p<0.001$).

4.1.3 Perceived Behavior Control. It was hypothesized that diving certified respondents' ease of sharing marine conservation Instagram posts would be positively associated with the intention to perform marine conservation behaviors. Correlation analysis in Table 3 shows a significant positive correlation ($r(266)=0.499$, $p<0.001$) between PBC attitudes toward Instagram sharing and conservation intent.

Table 3 *Correlations between Theory of Planned Behavior and Intentions of Marine Conservation (N=266)*

Variables	Attitude	Subjective Norms	PBC	Intentions Environment
Attitude	–	–	–	–
Subjective Norms	0.462***	–	–	–
PBC	0.497***	0.573***	–	–
Intentions Environment	0.362***	0.480***	0.499***	–

Note: Correlation values represent Pearson correlations.
*p<.05, ** p<.01, ***p <.001, two-tailed test

4.2 Understanding Instagram, TPB, and Intent toward Marine Conservation Actions

To better understand the relationship between Instagram, theory of planned behavior and the intent to participate in marine conservation efforts among diving certified individuals, the study conducted an ordinary least squares regression with the intent to engage in marine conservation as the outcome variable. Level of diving certification, frequency of seeing Instagram marine conversation content, theory of planned behavior predictors (attitudes, subjective norms and perceived behavioral control) and demographics were entered as predictors in a linear regression model. Based on the previous analysis, it is likely that the theory of planned behavior variables will significantly contribute toward the outcome variable even when controlling for Instagram use, diving certification, and respondent demographics. As shown in Table 4, the linear model explains about a third of the variation in the outcome variable (R^2=0.35) and shows good overall fit (F(8, 257)=17.4, p<0.001). As stated, subjective norms (β=0.197, p<0.001) and perceived behavioral control (β=0.231, p<0.001) were significantly

positively associated with the intention to participate in marine conservation. As a result, hypotheses two and three are supported by the model. Contrary to expectation, attitudes toward marine conservation Instagram posts failed to predict intent toward marine conservation though in the expected direction. Therefore, hypothesis one is not supported. In addition, level of diving certification ($\beta=0.51$, $p<0.01$) and frequent exposure to marine conservation Instagram content ($\beta=0.037$, $p<0.05$) were significant predictors for buying eco-friendly products and other pro-marine conservation activities.

Table 4 *Ordinary Least Squares Regression Predicting Intentions of Marine Conservation Action (N=266)*

Variables	**Unstandardized Beta (standard error)**	***P***
Age	-0.028 (0.032)	0.394
Female	0.061 (0.0446)	0.172
Education Levels	0.010 (0.028)	0.725
Diving Certification	0.051 (0.018)	0.005
Frequency of Seeing Marine Conservation Posts	0.037 (0.017)	0.029
Attitude	0.049 (0.038)	0.201
Subjective Norms	0.197 (0.047)	<.001
Perceived Behavioral Control	0.231 (0.058)	<.001
F	17.4	<0.001
R^2	0.351	
Adjusted R^2	0.331	

Chapter 5 Discussion

This study examined whether marine conservation posts on Instagram influenced marine divers' intention to participate in marine conservation behavior. Based on the three supported research hypotheses, the research shows Instagram can lead people who are divers to show more concern about marine conservation issues.

The present study found that the TPB model is helpful for explaining how Instagram contributes to improved environmental intentions toward marine conservation among a specific population. Diving as a recreational activity is closely associated with the underwater experience and marine life (Merchant, 2011; Strandvad, 2018) and one of the fastest growing sports in the world. In the population of divers sampled for this study, respondents utilized Instagram that coincided well with TPB model factors. Thus, this study is important by going beyond understanding how the frequency of Instagram use relates to environmental concerns to demonstrating the planned behavior of marine conservation on Instagram (e.g. attitudes toward intention, subjective norms and perceived behavioral control) leads to marine conservation intention. Therefore, positive attitude, strong peer norms and perceived time and resources toward marine conservation Instagram content has a positive correlation with future marine conservation behavior. When modeling factors that predict the intent toward marine conservation behavior, levels of diving certification and frequency of seeing marine conservation content on

Instagram were significant factors as well as peer norms and perceived behavioral control. Instagram provides environmentally interested individuals with an opportunity to receive positive feedback in the form of likes and comments and encourage shared norms around marine conservation content that directly leads to pro-environmental intentions. The next section will discuss the various aspects of the TPB model and its implications for Instagram and marine conservation.

5.1 Planned Behavior on Instagram

Theory of Planned Behavior emphasizes behavioral attitude-related aspects, while the environment-related value-belief-norm model focuses on the importance of ethical elements when setting environmental behaviors (Aguilar-Luzón, García-Martínez, Calvo-Salguero, & Salinas, 2012). Furthermore, several scholars suggest that using the TPB as a tool to research environmental behavior can clarify both purpose and potential behaviour (E.g., Bamberg, Ajzen, & Schmidt, 2003; Boldero, 1995; Hwang, Kim, & Jeng, 2000; Kaiser, Hübner, & Bogner, 2005; Kaiser, Wölfing, & Führer, 1999; Mannetti, Pierro, & Livi, 2004).

As noted earlier, there is a research void on how social media affects the online marine conservation activity of a diver. More precisely, no research has been performed that has explored Instagram's visual communication network and its ability to influence environmental behaviors of diving course participants. The literature review conducted found that there was an

emphasis on the level of experience of the divers and how many courses they took but not any link with their activity on social media and their knowledge about the environment.

5.2 Attitude Toward Intentions

Attitudes toward intentions, as expected in the TPB model, was the same as predicted in that diving certified respondents' attitudes toward marine conservation Instagram posts would be positively associated with the intention to perform marine conservation behaviors. However, compared with the other two hypotheses, attitudes had a lower correlation with the respondent's intention toward marine conservation acts. In addition, as a theorized predictor for engaging in future marine conservation acts, attitudes did not significantly predict one's intent to participate in marine conservation in the regression model. It is possible that on Instagram, as a networked visual content platform, peer influence could be more important than the users own beliefs about Instagram content (Lobinger, 2016). Users concentrate more on users' connection, as this section asks for their personal opinion, which is not as high as the other two hypotheses. As Howell et al. (2014) noted, attitudes are not a reliable predictor of behavior in the TPB model. The findings from this study determined that attitudes were not a reliable predictor for marine conservation intention either.

5.3 Subjective Norms

In the subjective norms section's result, it shows that Instagram is a significant factor to care about marine conservation issues. As hypothesized, respondents who believed their peers supported their engagement with Instagram marine conservation content were more likely to express intention to help with marine conservation efforts. The study found that peer pressure encourages divers to pay more attention to marine conservation. If diving respondents believe their friends want them to click "like " or "share" and "tag" them on marine conservation posts on Instagram, they would care more about marine conservation and social engagement on Instagram. In addition, diving respondents believe that sharing marine conservation posts on Instagram would help marine conservation efforts. It is also possible, as mentioned before, Instagram is a social media application designed to share and engage images with followers (Laestadius, 2016; Lobinger, 2016). Peer's influences must play an essential role in the platform. It demonstrates user's desire to share engaging content beyond themselves. This finding approves the second hypothesis: Divers' perceptions of peers' liking of marine conservation Instagram posts will be positively associated with the intention to perform marine conservation behaviors.

5.4 Perceived Behavioral Control

According to the third section of the survey, perceived behavioral control, it found that when diving respondents have time and resources, they believe they can make more of a

difference in the marine conservation environment as noted in the third supported hypothesis. In addition, most respondents believe they can make a positive impact on the environment by sharing marine conservation posts on Instagram. As the finding is possibly related to the structure of the platform, Instagram is a social media platform to exchange visual content and make connections with people. Divers, who have the time and resources, share marine conservation information on Instagram to help expose and spread these issues to wider audiences. In addition, in recent years, social media has become an essential platform for sharing information sources globally. It is one of the important sources with information on human-nature interactions (Toivonen et al., 2019). In other ways to describe Instagram as a significant tool for marine conservation, Instagram was conceived by its developers to create a 'world more connected by images' (Instagram, 2015a). It proves this study's hypothesis that respondents believe what they want, and they can make a difference in the world through Instagram.

As a result, theory of planned behavior offers a possible explanation to the present study's findings, demonstrating that the visual social media platform - Instagram - can lead people who are divers to show more concern about marine conservation issues. In addition, through their reaction from their peers and their attitude on what they saw on Instagram, divers intend to contribute to marine conservation in their offline behavior. Therefore, this study

demonstrates how an online community of divers on Instagram contribute toward environmental change based on their intent for offline marine conservation effort. Overall, the present study found that Instagram is one of the tools leading users to engage with offline society contributions. It is possible to use Instagram to boost users, at least people who do diving, and it could make an essential difference.

5.5 Social media and environmental change

Recent work has demonstrated how social media can make a difference in monitoring the environment and increasing public awareness of environmental concerns. For example, scholars have shown how public posts on Facebook can serve as an effective tool to inventory the spatial distribution of litter in marine environments (Abreo et al., 2019; Hove & Osunkunle, 2019). Based on the current study, divers on Instagram could also play an important role by monitoring marine litter posts encountered on the platform. Future work may observe how divers react and share troubling marine conservation content such as plastic litter in the ocean.

According to Wu et al. (2018) and others (Sullivan et al., 2019), social media provides a way to direct more attention toward conservation and promote detailed and accurate explanations to promote public understanding of wildlife conservation among policymakers and professionals. The findings from this study show how an Instagram community through liking and sharing visual marine conservation content promotes the intent for pro-environmental behavior. As a

result, governments and environmental non-profit organizations should identify Instagram communities that may have indirect connections to the environment (ex. through a recreational activity) to promote conservation messages to improve public understanding.

5.6 Diver characteristics on marine conservation

In a previous study, Thapa and colleagues (2005) considered how media consumption and clean-up efforts represent an educational orientation toward environmental behavior. The authors linked environmental media consumption with specific environmental action (beach cleanup) into an overall measure of environmental responsibility. Diver specialization had a significant effect on environmental responsibility. Similarly, the results of this study demonstrated that diving certification had a significant effect on intent to engage in marine conservation behavior. Though participants usually claimed that they participated responsibly in the marine environment based on self-reported behaviours. Thapa et al., however, demonstrated that the results of diving specialization were experience-related, as divers with higher levels of expertise appeared to have greater knowledge of the marine environment. Most diving respondents care about marine conservation after they have a diving certification. It shows even though respondents just start to take the diving course, it already engages them to show concern about marine conservation. For the higher levels experienced divers, as the previous study

mentioned, they have greater intention toward marine conservation (Thapa, Graefe, & Meyer, 2005).

In contrast to Thapa et al. (2005), the analysis separated the media effects and marine conservation behavior. Specifically, Instagram marine conservation posts predicted the intent to participate in an upcoming beach cleanup. In other words, the greater frequency of seeing marine conservation posts on Instagram led divers to express greater intent to protect marine conservation efforts. Thus, seeing marine conservation content on social media increased divers' intentions for environmental behavior. This study shows the importance of media effects on environmental intention toward behavior. Scholars in tourism and environmental studies should consider social media content as a predictor of environmental behavior rather than an outcome.

Previous research demonstrates the value of diving education on the marine environment. Scholars have attributed diving experience and certification with greater recognition of the detrimental effects of diving practices on the environment (Townsend, 2000). For example, diver behavior (e.g. time spent in each habitat), use (substrate contacts) and the immediate effects of diver interaction may have direct effects on the marine environment. In a similar way, the current study found that more advanced diving certification led to greater intent to participate in diving activities with marine-responsible dive shops. It means marine-responsible dive shops are far more likely to teach about how to reduce the risk of

damage to the marine environment and how to protect marine environments during diving tours or diving courses.

5.7 Limitation and future research directions

The present research study was conducted utilizing an online survey. As a result, it proves H2 and H3 statements. However, respondents may have been exposed to distractions, may not answer questions honestly or may not have followed the instructions. In addition, future research conducted online may include an instructional manipulation check to detect respondents who are not following instructions. Furthermore, participating in the study was voluntary and offered no compensation. The study was shared through multiple social media platforms and through mouth to mouth from diving instructors. Furthermore, the respondents mostly are women, which may affect the generalizability of the results. Future research should examine these results with a more diverse population. Similarly, the divers who participated in the survey were primarily from Taiwan and throughout Asia, future studies should examine other regions to observe how culture may play a significant role for media effects and the environment.

Respondents choosing to volunteer for the survey might already have the intention to care about marine conservation. Then, divers who were not interested in marine conservation might not want to participate in the study. Therefore, it may be difficult to generalize the proven hypotheses to other Instagram environmental communities. In this research, it is based on the

theory of planned behavior and only focuses on a respondents' intention but excludes their behavior. It is possible that intentions may not match with actual behavior. In future research, scholars should focus on divers' behavior rather than merely their intent as a long term research study.

An additional limitation to the study is its correlational nature. While correlations provide useful information regarding associations between Instagram-related TPB variables and marine conservation intentions, they can not provide information regarding causal relationships between the variables. For example, intentional marine conservation efforts may have caused individuals to have more planned behavior on Instagram marine conservation content. Furthermore, it is possible that environmental knowledge caused both planned behavior on Instagram marine conservation content and marine conservation intentions. Future research should experimentally test Instagram's impact on marine conservation intention in order to observe causal associations. Also, longitudinal studies would be a more useful way to make causal assertions between Instagram, the TPB model and environmental impact.

In addition, future research should look at diver's interpersonal communication levels between offline and online peers. It is possible that offline conversations among influential peers could contribute to their behavior on social media. For instance, even though divers are generally well-intentioned and care about the marine conservation topic and using Instagram, they may actually be much more active in offline marine conservation behaviors and social engagement

(ex. diving or environmental workshops) than other divers. Accordingly, sharing and tagging, as a form of social engagement with other people on Instagram, may not be conducted in their online behavior.

Chapter 6 Conclusion

Oceans and marine conservation is one of the most important environmental concerns in our lifetime. The ocean is the leading ecosystem. Human's safety, economy, and our survival all depend upon healthy oceans (Why we protect the ocean, n.d.). In addition, oceans provide humans breathable air, drinking water, nutritious food, and an environment where people can live based on their beauty, inspiration, and leisure. It not only provides a better environment to marine conservation but also significantly impacts humans and a better quality of life.

Social media is prevalent in today's society. Social networking has become an important platform in recent years for the global exchange of information sources. It is one of the main news sources between human and nature interaction (Toivonen et al., 2019). Instagram is presently the world's most famous social media app (Huang & Su, 2018). In this study, Instagram shows the important levels of character play for marine conservation contributions between users. The finding demonstrates that Instagram is important for people concerned about marine conservation issues. In addition, the implication of this study shows that among divers, who are Instagram users, care more about their peers' advice or thinking than themselves when engaging on the platform. For the finding of this study, it can be applied to future marine conservation contributions and influences users to focus on marine conservation issues.

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APPENDICES

Recruitment email

My name is Jeng, and I am a graduate student majoring in Communication at the University of Hawai'i at Mānoa. We are conducting a research study about how divers face marine conservational posts on Instagram and their offline behavior. I am emailing to ask if you would like to take about 15 minutes to complete a survey for this research project. Participation is completely voluntary and your answers will be anonymous.

If you are interested, please click on the link for the survey and additional information: www.linktosurvey.com. If you have any questions, please do not hesitate to contact me kcchen@hawaii.edu

Thank you for your time.

Consent form

Aloha! My name is Jeng (Kuan-Chen), Chen and you are invited to take part in a research study. I am a graduate student at the University of Hawai'i at Mānoa in the Department of Communications. As part of the requirements for earning my graduate degree, I am doing a research project.

What am I being asked to do?

If you participate in this project, you will

be asked to fill out a survey.

Taking part in this study is your choice.

Your participation in this project is completely voluntary. You may stop participating at any time. If you stop being in the study, there will be no penalty or loss to you. Your choice to participate or not to participate will not affect your rights to services at the UH Campus Recreational Facilities.

Why is this study being done?

The purpose of my project is to examine the relationship between diving education, social media, and marine conservation behavior.

What will happen if I decide to take part in this study?

The survey will take about 15 minutes. The survey questions will include questions like, “How often do you go diving?”, “When did you get your certificate?”, and Likert scale questions (“agree” or “disagree”, etc.) . The survey is accessed on a website to which I will provide you a link.

What are the risks and benefits of taking part in this study?

I believe there is little risk to you for participating in this research project. You may become stressed or uncomfortable answering any of the survey questions. If you do become stressed or uncomfortable, you can skip the question or take a break. You can also stop taking the survey or you can withdraw from the project altogether.

There will be no direct benefit to you for participating in this survey. The results of this project may improve the awareness of pro-environmental issues to benefit future divers.

Confidentiality and Privacy:

I will keep all study data secure in a locked filing cabinet in a locked office/encrypted on a password protected computer. Only my University of Hawai'i advisor and I will have access to the information. Other agencies that have legal permission have the right to review research records. The University of Hawai'i Human Studies Program has the right to review research records for this study.

Questions: If you have any questions about this study, please call 8082557615 or email me at kcchen@hawaii.edu. You may also contact my faculty advisor, Dr. Wayne Buente, either by phone 808-956-3360 or email wbuente@hawaii.edu. Please visit http://go.hawaii.edu/jRd for more information on your rights as a research participant.

To Access the Survey: Please go to the following web page: (Link). You should find a link and instructions for completing the survey. Going to the first page of the survey implies your consent to participate in this study.

Please print or save a copy of this page for your reference.

Mahalo!

Traditional Chinese Version
Recruitment email + Consent form 研究參與者同意書

您好！我是Jeng Chen陳冠臻，目前就讀於夏威夷州立大學傳播學系。您被邀請參與一個「社群媒體Instagram影響潛水員的意圖於海洋保護意圖行為」研究(以下簡稱本研究)，這份研究參與者同意書(以下簡稱本同意書)主要是要向您充分的說明有關本研究的相關資訊，以便於您決定是否要參加本研究。若您在閱讀本同意書或參與本研究的過程中，對於本研究仍有任何的疑問，歡迎您隨時向計畫主持人或相關研究人員提出來，我們將為您做詳細的說明和回答。如果您決定參與本研究，請在這一份研究參與者同意書上簽名以代表您同意參與本研究。

我應該做什麼？
如果您願意參與於此研究，您將會被要求填寫一份問卷。

參與此研究完全參照您的意願
您的參與此研究完全是自願性的，你可以任何時刻隨時終止參與研究，如果您停止參與，您的退出不會因此引起任何不愉快、產生任何不良後果，或影響到您任何其他方面的權益。

研究的目的？
本研究之目的是瞭解潛水員如何看待Instagram上環保相關的內容。

我需要做什麼？
取得告知同意之對象、同意方式及程序：本研究預定發送此同意書參與者信箱，填寫問卷過程約需15分鐘。問題將會包含以下問題，例如"你多久會去潛水？","你何時拿到你的潛水執照？"等等，以下我將會提供問卷連結給你。

參與此研究會有什麼風險？
我相信此研究幾乎不會有任何風險，但您若有感覺到任何不適或不想回答您可以跳過問題或是暫緩一下再作答。亦或是停止參與這個研究。
參與本計畫將不會為您帶來直接的利益。然而，您的參與將有助於社會整體對本計畫所研究的主題之了解，對於未來潛水員的環境保護議題，學術研究方面會有正面的影響。

保密原則：

本研究將依法把任何可辨識您身分之紀錄與您的個人隱私資料視為機密來處理，不會公開，也不會向與本研究無關的人員透露。您也瞭解若簽署本同意書即表示您了解並同意研究倫理審查委員會的成員及研究倫理主管機關，為保障您作為研究參與者的權利，以確保研究過程與數據符合相關法規要求，並確定研究者所進行的研究是否恰當，可基於法定的權利要求監測、稽核與查核您所提供的原始資料，上述人員均承諾不會洩露任何與您身份有關之資料，以確保您的身份之機密性。

若有疑問：

如果您作為研究參與者的權益有任何疑慮或申訴你可以撥打808.956.5007或是與人類研究項目聯絡，信箱為uhirb@hawaii.edu討論問題、關切和問題；獲取信息；或想與夏威夷美國州立大學特定研究協議的研究人員聯繫。

參與研究：

請轉到以下網頁：（鏈接）。您應該找到完成調查的鏈接和說明。進入調查的第一頁表示您同意參加本研究。

請打印或保存此頁面的副本以供參考。

謝謝您！

Survey Questions

This research survey is divided into five sections, which included general question section, Instagram use section, users attitude and emotion, users' online behavior and offline behavior.

- **A. General Questions:**
  - Who are those people? ex: Female or male, education level background, etc.
    - Ages: What is your age? Please mark the appropriate range.
      1)18-24 years old, 2) 25-34 years old, 3) 35-44 years old, 4) 45-54 years old, 5) 55 years and up
    - Gender: What is your gender?
      1) Female, 2) Male, 3) Other, 4) Do not want to identify
    - Education levels: What is your highest education level?
      1)Less than a high school diploma, 2)High school degree or equivalent (e.g. GED), 3) Some college, no degree, 4) Associate degree (e.g. AA, AS), 5) Bachelor's degree (e.g. BA, BS), 6) Master's degree (e.g. MA, MS, MEd), 7)Professional degree (e.g. MD, DDS, DVM), 8)Doctorate (e.g. Ph D, EdD)
    - Are you a freediver or scuba diver? 1) Yes 2) NO
    - Diving background or experience:
      1) Under 1 year, 2) 1-2 years, 3) 2-3 years, 4) 3-5years, 5) 5-10 years, 6)10 years and up
    - How often do you go diving?
      1) under 5 days/ year 2) under 10 days/ year 3) under 20 days/ year 4) under
      50 days/ year 5under 80 days/ year 6) More than 100 days/ year
    - Do you have a diving certification? Either freediving or scuba diving, what kind of certificate do you have if applicable?
      1). OW, 2) Lv1 Freediver 3) Lv2 Freediver 4) Lv3 Freediver 5) Lv4 Freediver 6) AOW, 7) Rescue & EFR, 8) Dive Master, 9) Assistant Instructor 10) Scuba diving Instructor, 11) Freediving Instructor

- **B. Instagram Use**
    - Are you an Instagram user? 'Yes', 'No'

        - How often do you use Instagram? ‘Everyday’, ‘4-6 times per week’, ‘2-3 times per week’, ‘1 time per week’, ‘Never’
        - How often do you see marine conservation posts on Instagram in one week? ‘Everyday’, ‘4-6 times per week’, ‘2-3 times per week’, ‘1 time per week’, ‘Never’
        - (Marine conversation posts are understood to be Instagram posts featuring environmental issues and concerns related to oceans and their ecosystems).

- **C. Attitudes toward the behavior - Users’ Attitude and Emotion** 7 Item Index

        - For me, marine conservation posts on Instagram are …
          Bad (1) - Good (7)
          Unimportant (1) - Important (7)
          Unpleasant (1) - Pleasant (7)

- **D. Subjective norms - Online behavior on Instagram:**
    - Likert Scale ‘Strongly Agree, ‘Agree,’ Neutral’, ‘Disagree’ or ‘ Strongly Disagree’
        - My friends want me to "like" marine conservation posts on Instagram.
        - My friends want me to "share" marine conservation posts on Instagram.
        - My friends want me to "tag" them in marine conservation posts on Instagram.
        - My friends believe that sharing marine conservation posts on Instagram would help marine conservation efforts.
          Strongly Agree (1) - Strongly Disagree (5)

- **E. Perceived behavioral control**
    - Likert Scale ‘Strongly Agree, ‘Agree,’ Neutral’, ‘Disagree’ or ‘ Strongly Disagree’
        - I can make a positive impact on the environment by sharing marine conservation posts on Instagram.
        - I have time to share marine conservation posts on Instagram.
        - I have resources to share marine conservation posts on Instagram..

- **F. Dependent Variable - Behavioral intentions**
    - Likert Scale ‘Strongly Agree, ‘Agree,’ Neutral’, ‘Disagree’ or ‘ Strongly Disagree’

- In the next few months, I intend to donate to marine conservation causes.
- In the next few months, I intend to participate in a beach cleanup.
- In the next few months, I intend to learn more about marine conservation laws.
- In the next few months, I intend to use eco-friendly products.

Strongly Agree (1) - Strongly Disagree (5)

Traditional Chinese Version

A. 基本問題

- 請問您今年幾歲？
  - 18-24歲
  - 25-34歲
  - 35-44歲
  - 45-54歲
  - 55歲以上

  請問您的性別為？
  - 女

    男

    其他

    不回答

  請問您的教育程度？
  - 高中以下
  - 高中

    學院

    大學

    碩士

    博士

A-1: 潛水經驗

- 請問您是否為水肺潛水員或是自由潛水員？
  - 是
  - 否
- 請問您的潛水經驗已有：
  - 一年以內
  - 三年以內
  - 五年以內
  - 七年以內十年以內
  - 十年以上
- 請問您每年平均潛水天數為……
  - 一年五天以內
  - 一年十天以內
  - 一年二十天以內
  - 一年五十天以內
  - 一年八十天以內
  - 一年一百天以上

- 以下為自由潛水或是水肺潛水證照等級，請問您目前的潛水證照等級為？
    - Lv1 Freediver 或 Lv2 Freediver 或 OW Scuba Diver
    - Lv3 Freediver 或 AOW Scuba Diver
    - Lv4 Freediver 或 Rescue Scuba Diver
    - Dive Master Scuba Diver 或 Freediving Assistant Instructor
    - Scuba diving Instructor 或 Freediving Instructor 或是以上等級

B-1. 社群媒體使用問題

- 請問你有使用 Instagram 嗎？
    - 有
    - 沒有
- 請問你多常使用 Instagram？
    - 每日
    - 每周 4 到 6 次
    - 每周 2 到 3 次
    - 每週一次
    - 從不
- 請問你一周內有多常會在 Instagram 看到海洋環境保護議題的資訊？（包含貼文、限時動態、 私訊、IGTV、廣告）
    - 每日
    - 每周4到6次
    - 每周2到3次
    - 每週一次
    - 一週內小於一次

C. 使用者態度問題：此為了解當你看到相關貼文的態度反應

- 當我在 Instagram 看到海洋環境保護議題的資訊，以我認為，這些資訊對於網路媒體的正確以及重要性為……

非常不好		Select this answer if you prefer 非常不好 over 非常好 by 3 points.	Select this answer if you prefer 非常不好 over 非常好 by 2 points.	Select this answer if you prefer 非常不好 over 非常好 by 1 points.	Select this answer if you have no preference between 非常不好 and 非常好.	Select this answer if you prefer 非常好 over 非常不好 by 1 points.	Select this answer if you prefer 非常好 over 非常不好 by 2 points.	Select this answer if you prefer 非常好 over 非常不好 by 3 points.		非常好

一點都不重要		Select this answer if you prefer 一點都不重要 over 極為重要 by 3 points.	Select this answer if you prefer 一點都不重要 over 極為重要 by 2 points.	Select this answer if you prefer 一點都不重要 over 極為重要 by 1 points.	Select this answer if you have no preference between 一點都不重要 and 極為重要.	Select this answer if you prefer 極為重要 over 一點都不重要 by 1 points.	Select this answer if you prefer 極為重要 over 一點都不重要 by 2 points.	Select this answer if you prefer 極為重要 over 一點都不重要 by 3 points.		極為重要
極為不高興		Select this answer if you prefer 極為不高興 over 極為高興 by 3 points.	Select this answer if you prefer 極為不高興 over 極為高興 by 2 points.	Select this answer if you prefer 極為不高興 over 極為高興 by 1 points.	Select this answer if you have no preference between 極為不高興 and 極為高興.	Select this answer if you prefer 極為高興 over 極為不高興 by 1 points.	Select this answer if you prefer 極為高興 over 極為不高興 by 2 points.	Select this answer if you prefer 極為高興 over 極為不高興 by 3 points.		極為高興

D. 個人與同儕社群媒體行為研究問題

- 在 Instagram上，朋友或我的追蹤者認為我”關注“海洋環境保護議題的資訊，是正面的。
    - 非常同意
    - 某種程度上同意
    - 既不同意也不反對某種程度上不同意
    - 強烈反對

- 在 Instagram 上，朋友或我的追蹤者認為我”分享“海洋環境保護議題的資訊，會對海洋環境有正面的影響。
    - 非常同意
    - 某種程度上同意
    - 既不同意也不反對
    - 某種程度上不同意
    - 強烈反對

- 在 Instagram 上，我關注海洋環境保護議題的資訊，若我”標記“朋友或我的追蹤者們，他們會認同這件事，甚至有可能轉發分享。

- 非常同意
- 某種程度上同意
- 不同意也不反對
- 某種程度上不同意
- 強烈反對

- 在 Instagram 上，朋友或我的追蹤者相信發佈有關海洋環境保護議題的貼文，會對海洋環境有正面的影響。
  - 非常同意
  - 某種程度上同意
  - 既不同意也不反對
  - 某種程度上不同意
  - 強烈反對

E. 感知行為控制

- 透過我在 Instagram 上的行為，對海洋環境保護有正面的影響。
  - 非常同意
  - 某種程度上同意
  - 既不同意也不反對
  - 某種程度上不同意
  - 強烈反對

- 若我有時間，我會想要在 Instagram 上分享海洋環境保護的資訊。
  - 非常同意
  - 某種程度上同意
  - 既不同意也不反對
  - 某種程度上不同意
  - 強烈反對

- 若我有海洋環境保護相關的知識或資訊，我會想要在 Instagram 上發文分享。
  - 非常同意
  - 某種程度上同意
  - 既不同意也不反對
  - 某種程度上不同意
  - 強烈反對

E. 行為意圖

- 在未來，我可能會想捐款給海洋環境保護相關活動或組織（或已有相關行為）。
  - 非常同意
  - 某種程度上同意
  - 既不同意也不反對

    - 某種程度上不同意
    - 強烈反對

- 在未來，我可能會想要參與淨灘或海洋環境保護相關活動（或已有相關行為）。
    - 非常同意
    - 某種程度上同意
    - 既不同意也不反對
    - 某種程度上不同意
    - 強烈反對

- 在未來，我可能會想了解有關海洋環境保護的法規（或已有相關行為）。
    - 非常同意
    - 某種程度上同意
    - 既不同意也不反對
    - 某種程度上不同意
    - 強烈反對

- 在未來，我可能會想要使用海洋環境保護的產品，例如：環保餐具，環保袋……等（或已有相關行為）。
    - 非常同意
    - 某種程度上同意
    - 既不同意也不反對
    - 某種程度上不同意
    - 強烈反對

- 我可能未來在選擇潛水店家參與活動時，店家對於海洋環境保護的態度會影響我是否選擇的意願。
    - 非常同意
    - 某種程度上同意
    - 既不同意也不反對
    - 某種程度上不同意
    - 強烈反對