

INFORMAL SCIENCE LEARNING INSTITUTIONS AND SOCIAL MEDIA
ENGAGEMENT

A Thesis

by

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This thesis meets the standards for scope and quality of
Texas A&M University-Corpus Christi and is hereby approved.

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ABSTRACT

Uses and gratifications theory has been widely used to examine the motivations individuals have to consume media. This study utilizes uses and gratifications theory in combination with consumers' online brand related activities and engagement outcomes to determine how and why individuals engage with informal science learning institutions, such as zoos, aquariums, and museums, on Twitter. Its results contribute to uses and gratifications literature because it supports the notion that uses and gratifications theory can be applied to social media engagement and explores the theory as applied to informal science learning institutions. This study also examines the engagement outcomes of these motivations. The motivations associated with engagement on Twitter are information, entertainment, personal identity, social interaction, empowerment, remuneration, and brand love. These engagement motivations can influence a follower to consume, contribute, or create content. The motivations can also help improve trust, conative loyalty, affective loyalty, and purchase intention. The results of this study suggest that information, entertainment, and social interaction are the most powerful motivators for consuming content, and information and entertainment can lead to increased trust, conative loyalty, and purchase intention. Communication professionals that work at informal science learning institutions will be able to use the results of this study to create effective Twitter content.

Keywords: uses and gratifications theory, consumers' online brand related activities, social media, engagement, informal science, strategic communication

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CHAPTER I

INTRODUCTION

Zoos and aquariums are informal science learning institutions (ISLIs), a category that also includes science museums, natural history museums, and science centers. Informal science learning institutions “are places that convey complex science ideas and phenomenon through non-traditional and engaging ways” and emphasize “curiosity, excitement, and motivation” (Adams & Gupta, 2017, p. 121). Informal learning refers to knowledge gained outside of the academic or work setting where learning is voluntary. Informal science learning specifically focuses on science, technology, engineering, and math (Brookfield et al., 2016). Individuals who participate in informal science learning may exhibit better performance in formal learning settings, an increased confidence in scientific knowledge, and more positive attitudes towards science (Falk et al., 2012). There are five categories of people who visit ISLIs, museums in particular: (1) explorers, (2) facilitators, (3) professionals/hobbyists, (4) experience seekers, and (5) rechargers (Falk, 2006). Explorers are visitors who are generally interested in the content of the ISLI and want to learn something new. Facilitators are socially motivated and focus on enhancing the learning and experience of other people in their social group. According to Falk (2006), professional visitors and hobbyists have an interest and knowledge of the content but want to enhance “their profession, avocation, or hobby” (p. 157). Experience seekers believe the ISLI is an important destination and they want to be able to say they have been there. Rechargers are visitors who want to be restored and see the ISLI as a way to escape the everyday world. Informal learning has typically been conducted in person at informal learning institutions; however, informal learning can also now be done online through social media.

There have been many successful social media campaigns launched by ISLIs, such as zoos and aquariums. In January 2017, Smithsonian’s National Zoo tweeted a photo of an adorable gray seal pup. The tweet was viewed by hundreds of Twitter users and received over 200 replies and 650 likes. The Virginia Aquarium responded with a photo of an otter and osprey interacting, captioned “#challengeaccepted.” The National Zoo then responded with a picture of a Bornean orangutan baby. After several interactions, Twitter user Sarah Hill Darrow (@sarahhilldarrow) posted screenshots of the tweets sent by the National Zoo and Virginia Aquarium with the caption “You know what we need today? A #cuteanimal tweet-off.” In her post, she tagged eight additional zoos. This led to multiple zoos and aquariums tweeting pictures of their cutest animals with the hashtag #cuteanimaltweetoff. The Maryland Zoo, National Aquarium, Zoo Atlanta, Georgia Aquarium, and Seattle Aquarium were among the zoos and aquariums that were involved. The hashtag #cuteanimaltweetoff was created organically, but zoos and aquariums around North America were quick to participate in the trend. The hashtag went viral and received media coverage from several major news sources, including The New York Times, The Dallas Morning News, CBS News, and People.com. Nabila Chami, social media manager for the National Aquarium, was quoted by one media source as saying, “believe it or not, sharing cute animals helps us keep the attention of our social community when we’re trying to get some of our more serious messages across” (Twiford, n.d., n.p.). Through this organic social media campaign, zoos and aquariums used the hashtag as a way to spread awareness of endangered species to a wide audience.

Another successful social media campaign is the #rateaspecies campaign, which began in March 2018 and quickly went viral. Zoos, aquariums, and other wildlife centers posted Amazon-style product reviews of animals residing at their institutions. One example of a #rateaspecies

Tweet comes from the Yosemite Conservatory. The tweet featured a photo of a pika pika with the caption “4 stars. PROS: High-quality squeak system, thrives in rocky situations, hay for days. CONS: Maybe TOO cute. Potential pun hazard. #pikaboo #rateaspecies” (Debczak, 2018, n.p.). It became a “silly, carefree way to learn real facts about the amazing creatures around us” (Canty, 2018, n.p.). Other popular social media campaigns include the #AquademyAwards, in which zoos and aquariums used puns to nominate their animals for awards such as “Best Swimatography,” and #VDayPunOff, which included Valentine’s Day animal puns such as “May our love never tapir off” with a photo of a tapir which was Tweeted by the San Diego Zoo (Know Your Meme, 2019, n.p.).

Hashtags are just one strategy that zoos and aquariums use to engage with their audiences on social media. Another form of engagement is through livestreams. The Monterey Bay Aquarium features continuous web livestreams of its aviary, bay, coral reef, open sea, sea otters, sharks, penguins, and jellyfish habitats and exhibits. These livestreams are easily accessible on the Monterey Bay Aquarium’s website as well as on their YouTube channel, which allows viewers to like the videos and share them with their friends. The Houston Zoo also has live web cams of its elephants, gorillas, rhinos, and leafcutter ants that stream for 12 hours every day. An option to share the video via Facebook, Twitter, or email is available on every livestream. These livestreams allow individuals who may never have the opportunity to visit a zoo or aquarium to watch and learn about animals.

Some of the most successful informal science learning institution social media campaigns combine hashtags and livestreams with other engaging events and activities.

Smithsonian’s National Zoo is a great social media success story with its 2017 #ByeByeBaoBao campaign. Bao Bao is a giant panda who lived at the National Zoo for three

and a half years. Because of “the cooperative breeding program with the China Wildlife Conservation Association (CWCA) that the Smithsonian’s National Zoo and Conservation Biology Institute participates in for giant pandas” (Smithsonian’s National Zoo, 2016, n.p.), all giant panda cubs that are born at the zoo must be sent to China by the time they reach four years of age. This allows for successful and diverse breeding of pandas, which, as of 2016, are a vulnerable species, according to the International Union for Conservation of Nature (Swaigood, Wang, & Wei, 2016). The National Zoo hosted a variety of events for Bao Bao’s farewell celebration. Six days of Facebook livestreams helped connect people with Bao Bao. Some of the livestream footage included Bao Bao painting, participating in training programs and enrichment sessions, and leaving the zoo and arriving at Washington Dulles International Airport. The National Zoo also hosted a Reddit “Ask Me Anything” in which Reddit users could directly ask a giant panda expert questions about conservation, biology, behaviors, and veterinary care (IamA Giant Panda Expert AMA!, 2017). The public was also invited to post a farewell message for Bao Bao using the hashtag #ByeByeBaoBao. Between February 12 and February 22, 2017, approximately 34,000 tweets about Bao Bao were posted on Twitter (Scraawl, 2017). This campaign resulted in the National Zoo being included in the finalist circle for the 2018 “Best of Silver Anvil” award in the category “Most Effective Campaign \$5,000 or Less” sponsored by the Public Relations Society of America (Essner, 2018).

Perhaps one of the most widely recognized livestream campaigns was implemented by Animal Adventure Park in New York. The zoo began livestreaming April the giraffe’s pregnancy in 2017 as a way to include local fans in her pregnancy and birth story. The livestream spread further than expected and eventually topped 50,000 viewers at a time (Associated Press, 2017). The livestreams raised awareness of the zoo and giraffes as a

species. The Cincinnati Zoo had a similar successful Facebook campaign featuring Fiona the hippo. Fiona was born prematurely on January 24, 2017. No one at the zoo expected Fiona to survive because she was severely underweight and small. The Cincinnati Zoo posted Facebook updates about Fiona's high- and low-points, sharing the good and bad news with its public. The posts reached hundreds of thousands of people and attracted visitors from all over the world to the zoo to see Fiona. If the zoo did not post an update, commenters would ask for updates. Fiona was beloved and "became a symbol of resilience and positivity" (Syme, 2017, n.p.). These campaigns were made possible because of social media.

Social media is any online tool that allows individuals to interact with one another by sharing content, opinions, information, and interests (Papasolomou & Melanthiou, 2012). According to Papasolomou and Melanthiou (2012), social media sites allow users to "produce, publish, control, critique, rank, and interact with online content" (p. 320) and include blogs, social networking sites, video sharing platforms, and wikis. Some examples of social media platforms are Facebook, Instagram, Twitter, YouTube, LinkedIn, TikTok, and Snapchat. In the United States, around 93% of marketers use social media, including 90% of Fortune 500 companies (Men & Muralidharan, 2017). As evidenced by the aforementioned campaigns, social media are an excellent public relations tool because they encourage two-way communication and foster a collaborative, participative, and credible environment (Papasolomou & Melanthiou, 2012). Another reason social media is important is because of its ability to reach niche markets, such as zoo and aquarium fans (Coursaris et al., 2015). In fact, some social media platforms, such as Untappd and Dogster, are designed specifically for these niche markets. Untappd is an app designed for people who enjoy drinking and rating beer, and Dogster is a website for dog owners to connect and interact with each other (Voorveld, 2019).

Social media is interactive in nature, which provides consumers and brands the opportunity to engage directly with each other (Kumar & Nanda, 2019). Social media engagement is a behavioral process that refers to interactions on social media. Social media engagement can include liking, commenting, reposting, or sharing content (York, 2017). Organizations, such as ISLIs, that post on social media must measure the engagement occurring on social media posts. Public relations professionals have a responsibility to measure the success of public relations campaigns, and social media campaigns are no different. Engagement can be measured by examining how an audience interacts with an organization, examining how the audience provides feedback and reaches out to other audience members, or examining the two-way communication that occurs (Jiang et al., 2016). Engagement on social media can lead to numerous benefits, including growth in sales, attracting a wider audience, cost reductions, and greater customer loyalty (Hollebeek et al., 2016); therefore, it is necessary to understand how a brand may effectively promote engagement with its audience. This is especially important for ISLIs, such as zoos and aquariums, because online engagement may be used to reach a wider audience and spread awareness for conservation issues and, in return, may lead to an increase in supporter donations to wildlife funds, memberships, or visitors. Goh et al. (2013) found that brands that actively engage with their followers can reap economic benefits.

Social media presents “opportunities for mobilizing social movements and transforming inactive segments of the public into either the aware or active type of public” (Paek et al., 2013, p. 526). Social media is also valuable for ISLIs because it can reach a wide audience. According to Vrana et al. (2018), social media platforms provide ISLIs and other cultural institutions opportunities to distribute information and their exhibits in ways that were previously only accessible in person. ISLIs can communicate activities, exhibitions, values, reach people, build

relationships, connect with others, and increase engagement through social media. As of 2019, there were 217 zoos and aquariums accredited by the Association of Zoos and Aquariums in the United States (Association of Zoos and Aquariums, 2019). Every year, these zoos and aquariums receive over 183 million physical visitors (Association of Zoos and Aquariums, n.d.) and more than 42 million visitors on social media. This means that social media reaches approximately 23% of potential zoo and aquarium visitors. Not only are these social media followers potential visitors, they are potential donors as well. Some people may not live near or be able to visit an ISLI but, if they see something on social media they like, it may lead to more donations and support. The Association of Zoos and Aquariums (AZA) is especially interested in growing its social media reach. In its 2018 Annual Report, the AZA mentioned that “with a growing digital marketing strategy and new media opportunities, we are reaching zoo and aquarium visitors, and engaging new audiences around the world through messages of conservation, education, and the importance of accreditation” (Association of Zoos and Aquariums, 2018, p. 8).

Aquariums should focus on social media engagement because it may help with conservation efforts. Individuals who are knowledgeable about the ocean and ocean inhabitants will be encouraged to participate in conversations regarding ocean health and wellness. To participate in these conversations, people should have a knowledge of the ocean, be able to meaningfully communicate about the ocean, and be able to make informed decisions about the ocean (Fauville et al., 2015). Social media behooves museums because it boosts brand awareness, perceived quality of the museum, brand identity, and brand loyalty (Belenioti et al., 2018).

Therefore, the purpose of the current study is to determine the type of content that is most effective for increasing engagement on social media for ISLIs. The results of this study will

contribute to strategic communication literature. According to Deuel (2018), the Public Relations Society of America (PRSA) defines strategic communication as “the merging of public relations and marketing” (n.p.). Strategic communication uses public relations to help an organization build relationships and bridge the gap between the organization and its audience, while marketing allows professionals to focus on data to measure the results of their message. As a result, strategic communication merges public relations and marketing to create a result-driven plan of action. The results of this study will guide public relations professionals to use marketing tools and data. Specifically, the results can be used to help ISLIs connect with their social media followers and motivate their followers to engage with them.

Social media use has continued to increase every year since its inception and new social media platforms bring changes to public relations practices (Wright & Hinson, 2017). Individuals, corporations, and organizations frequently use social media. It is essential to develop an understanding of how and why followers use social media. Many social media managers believe they know what works for them, but they do not know why the content works. Uses and gratifications theory, consumers’ online brand related activities, and brand engagement outcomes will be used in the present study to provide valuable information to social media creators regarding how to effectively create content to attract and engage followers and will also help explain why engagement occurs. Large ISLIs may have a dedicated social media team with the knowledge and ability to strategically create content and analyze social media engagement metrics; however, smaller ISLIs may not have this luxury. In these cases, it is oftentimes an intern or someone with no communication background in charge of managing social media. These individuals may not have the training or knowledge of using social media for public

relations. This study will provide social media managers with guidelines to help them take full advantage of using social media for engagement.

The goal of this research is to bridge the gap between academics and practitioners. Public relations is a practical field of study; therefore, it is necessary to translate academic research so that it may be used by professionals. Evidence-based practices can be used by combining a professional's expertise, the client's situation, and practices based on research (Freberg et al., 2013). Professionals should engage with the academic community by sharing their experiences, thoughts, and troubles. Likewise, research should be included in professional successes. Public relations practitioners can be reluctant to work with public relations researchers because professionals and academics both believe the other group is out of touch with reality (SRoberts, 2014). The results of this study will be beneficial to social media managers and public relations professionals because it provides an understanding of the type of content ISLI audiences find engaging. The results of this study can be easily formatted into an infographic or short video that can be disseminated to and viewed by practitioners because research should be easily digestible by professionals (Dodd, 2016).

This research will provide insight to public relations, marketing, and social media professionals in the ISLI industry as to what content they should be posting and promoting to increase their engagement on Twitter. These professionals will have a better understanding of what the typical audience of ISLIs is looking for and can then tailor their content to fit the findings of this research. This study will further examine if uses and gratifications theory can be applied to social media engagement. Specifically, it will discover if uses and gratifications theory can be applied to ISLI Twitter engagement. According to Gao and Feng (2016), gratifications that users seek influence how they use media and behave on social media and "understanding

these gratifications is critical to providing the right content and to getting consumers actively engaged with brands on social media” (p. 869). Therefore, this research will also apply uses and gratifications theory to determine those motivations for followers of ISLIs on Twitter. Vale and Fernandes (2018) examined motivations to engage with football teams on Facebook. This study will use Vale and Fernandes’ (2018) motivations to engage with football teams on Facebook and apply them to Twitter engagement with ISLIs, which has not yet been examined. There has been limited research examining how uses and gratifications theory impacts brand engagement outcomes, such as trust, loyalty, and purchase intention. Therefore, this study will fill a gap in the knowledge of the relationship between motivations and outcomes. This is important to study because brand engagement outcomes can help strengthen the relationship between a brand and its audience.

Summary

In this chapter, the author provides a background of informal science learning institutions and their use of social media campaigns. Campaigns such as #ByeByeBaoBao, #RateASpecies, #CuteAnimalTweetOff, and livestreams provide opportunities for the public to connect and engage with ISLIs which may lead to an increase in sales, greater audience reach, and loyalty (Hollebeek et al., 2016). In chapter two, the researcher will provide a review of academic research that includes an in-depth examination of social media and a background of why and how audiences choose to use and engage with brands on social media.

CHAPTER II

LITERATURE REVIEW

In chapter one, the author discussed social media campaigns and provided a rationale for the present study. A discussion of academic research on social media use and public relations will be discussed in this chapter. In first section, the author will describe organizational public relations including building relationships, relationship satisfaction, and outcomes of relationships. The following three sections will contain information regarding social media, the importance of using analytics when determining the type of content to post, and engagement. This chapter concludes with a description of the consumers' online brand related activities concept followed by an explanation of uses and gratifications theory, the theoretical framework used in this study.

Organization Public Relations

Organization public relations refers to interactive patterns between an organization and its public that need to be managed by the organization (Hung, 2005). Scholars draw from interpersonal communication, organizational behavior, relationship building, marketing, and social psychology for organization public relations research (Ledingham & Bruning, 2000). Relationships are an integral component of organization public relations (Broom et al., 2000). Positive relationships can be developed through two-way, open communication (Lee & Park, 2013), and one goal of building relationships is for organizations and publics to develop mutual benefits (Cheng, 2018).

There are three stages of organization public relations: (1) antecedents of relationships, (2) relationship maintenance strategies, and (3) relationships quality outcomes (Ki & Hon, 2008). The multiple reasons that organizations establish relationships with the public are referred to as

the antecedents of relationships. These can be defined by perceptions, social and cultural norms, necessities, expectations, and needs for resources. Relationship maintenance strategies can build and sustain high-quality relationships. Maintaining positive relationships is achieved through cultivation strategies such as sharing tasks, providing access, positivity, networking, openness, and assurances (Ki & Hon, 2008). The first cultivation strategy, sharing tasks, means that there is an understanding that the organization and public are both responsible for the relationship. Organizations and publics can provide access by putting in efforts to reach out to the other party as a way to share opinions and thoughts. Positivity is a relationship cultivation strategy that refers to cheerful behaviors, pleasant interactions, and polite communication. Networking consists of friendship, information exchange, conversation, liking, and sharing between an organization and the public. Relationships are maintained through openness when the parties disclose their honest thoughts, feelings, concerns, and information with each other. The final cultivation strategy, providing assurances, refers to the value an organization places on its publics and their commitment to maintaining their relationships. The relationship cultivation strategies can lead to evaluations, behavioral intentions, and relational outcomes.

The behavior of a customer and relationship between the organization and public can be predicted through relational outcomes including trust, satisfaction, commitment, and control mutuality (Ki et al., 2015). According to Huang (2009), trust is the willingness to risk oneself to benefit the other party. It is indicated by integrity, dependability, and competence. Satisfaction is a result of reinforced positive expectations about the relationship. Organizations and publics in satisfied relationships feel favorably towards each other and recognize that the rewards of their relationship outweigh the costs. According to Ledingham and Bruning (1998), commitment “involves the decision to continue a relationship” (p. 58). Committed relationships are easier to

maintain than those that are not committed. The two types of commitment are affective, or value-driven, and calculative, or cost and benefit driven (Jo, 2018). Control mutuality involves the power and influence organizations and publics have on each other. Decision making is empowered by control mutuality. In addition, control mutuality fuels interdependence, helps with conflict resolution, and leads to agreements. The outcomes of organization public relations can lead to positive attitudes toward the organization as well as supportive behaviors (Ki & Hon, 2007).

Organizations can use interactivity to benefit their organization public relationships (Saffer et al., 2013). There are two types of interactivity: (1) functional interactivity and (2) contingency interactivity. Functional interactivity includes the features on a website that allow individuals to interact. For example, users can comment on Facebook posts or use the retweet button on Twitter to share someone else's tweet with their own followers. This action notifies the original poster of the interaction. Contingency interactivity means that the users' roles as interactors are interchangeable as users interact with each other. According to Saffer et al. (2013), when organizations use Twitter for two-way communication, their high-quality relationships improve and organizations that use Twitter strategically will build better relationships with their publics which can lead to trust, commitment, satisfaction, and control mutuality.

Ledingham (2006) suggests that organization public relationship dimensions "define the state, or quality, of an organization-public relationship, which, in turn, acts as a predictor of public behavior" (p. 475). Organization public relations are important to the present study, as the success of ISLIs depends on the public. Without visitors or fans, the ISLI will cease to exist. Twitter and other social media platforms are excellent ways to promote the relationship between

the ISLI and their audience. For this reason, the researcher will specifically explore Twitter use and engagement in the present study.

Social Media

The internet was first conceptualized in the early 1960s when Dr. Joseph Carl Robnett Licklider suggested the Intergalactic Computer Network, a network that would be user-friendly and feature digital libraries, cloud computing, online banking, and e-commerce (Internet Hall of Fame, n.d.). Licklider (1968) stated “in a few years, men will be able to communicate more effectively through a machine than face to face” (p. 21). He emphasized the role of humans, interactivity, and creativity in computer-mediated communication through online interactive communities. Licklider suggested these online communities would consist of people from different geographic locations that communicate based on common interests. An entire world of knowledge would be available for anyone who could afford to purchase a console capable of processing the online communities.

The beginning stages of the internet is known as Web 1.0. Individuals would use Web 1.0 to access information by reading, watching, and listening. Individuals could use Web 1.0 for one-way interaction (Surucu-Balci et al., 2020). There was a shift in using the internet for information to using it for connection and socialization in 2004 which made way for Web 2.0 (Hsu & Park, 2011). Web 2.0 is characterized by engagement and interaction on the internet and “signals a transition from isolation to interconnectedness” (Solomon & Schrum, 2007, p. 13). It is less about searching for information and more about sharing information. Web 2.0 includes websites such as wikis, photo-sharing sites, video-sharing sites, social media, and blogs. Content is not controlled by any one individual or entity because anyone can contribute to Web 2.0. There are more open source applications and free to use websites compared to the times of Web

1.0. Tiago and Verissimo (2014) described Web 2.0 as a “social revolution” (p. 704) because it brought relationships to the forefront of existing technologies. Social media is at the forefront of Web 2.0.

Social media is “designed to facilitate the dissemination of content through social interactions between individuals, groups, and organizations using Internet and web-based technologies” (Botha & Mills, 2012, p. 85). Social media consists of web applications that allow users to create and exchange content (Hollebeek et al., 2014). Social media is closely tied to public relations because both focus on creating and maintaining relationships (Freberg, 2019). It is characterized by online interactions, promotes two-way communication, and encourages participation (Fletcher & Lee, 2012). There are many benefits to social media. The first is cost, because there are no fees involved in joining and updating social media accounts. Social media is easily accessible by many people, which leads to another benefit: accessibility. Social media allows for unprecedented global reach that other forms of communication do not achieve. This provides social media users the ability to connect with new audiences. Messages are communicated instantly with no time lapse for disseminating information. Social media also allows for engagement between its users as well as between users, as well as between users and brands. According to Fletcher and Lee (2012), engagement between users and brands may lead to concerns being addressed quickly, options for personalization, and a growing relationship. Additionally, social media is interactive, collaborative, and a place to collect information (Valos et al., 2019). A social media presence can lead to awareness, knowledge, consideration, and selection of a certain brand (Funk, 2013). Customers search social media for information about a brand before becoming a patron. According to Funk (2013), brands having an established social media presence can also lead to satisfaction, advocacy, and loyalty because relationships are an

important aspect of the medium. Through social media, users can generate their own content, connect with friends and family, and interact directly with brands.

The first official social media site, launched in 1997, was SixDegrees.com; however, early remnants of social media emerged around the advent of the internet (Squires, n.d.). Bulletin board systems (BBS) were created in 1978. BBS allowed users to read news, message others, and download or upload software (Edosomwan, et al., 2011). The 1990s saw the emergence of many social networking sites. One of the first websites to resemble social media was Usenet, a website created in 1979 where users could post and read messages, resembling modern forums. There were also many niche social media websites that brought people together based on their interests, as well as blogs where individuals could create their own content to share. Social media became mainstream and widespread in the early 2000s when websites such as MySpace, LinkedIn, lastFM, Wikipedia, Facebook, and YouTube were created.

Social media can be broken into several categories including social networking sites, microblogs, media sharing sites, discussion forums, and social shopping networks. There is no clear way to categorize social media platforms; however, there are several general rules that they follow. For example, all social networking sites are websites that allow individuals to connect, keep in touch, and engage with people they know, as well as connect with strangers based on their interests; whereas general social media websites are best for broadcasting information to a wide audience. According to boyd and Ellison (2008), social networking sites allow individuals to create a profile that can be public, semi-public, or private, identify a list of users that they would like to connect with, and view the profiles of the people they are connected with. Social networking sites can benefit brands because they bring brand awareness, can generate leads, play a role in relationship building, and are excellent channels for customer service (Foreman, 2017).

Examples of social networking sites include Facebook and LinkedIn. Social networking sites are meant to be used for two-way communication and connecting with others. Microblogs, another category of social media, are social media platforms that encourage users to share short instant messages with an audience (Zappavigna, 2017). Media sharing sites, such as Instagram, Snapchat, and YouTube, are websites that allow users to share photos, videos, and live videos with their network. Users can follow or subscribe to accounts so they will see their content on their homepage. Media sharing sites are beneficial because they lead to audience engagement and brand awareness. The three most used social media websites on a global scale are Facebook, Instagram, and Twitter (Guttman, 2019).

Facebook is a social networking site that was founded in 2004 by Mark Zuckerberg (Edosomwan et al., 2011). Facebook began as a way for Harvard students to connect with each other. It then grew to include over 800 colleges in May 2005, and then high school networks in September 2005. Eventually, in 2006, Facebook became open for anyone to join. It is the most popular social media platform in the world (Alhabash & Ma, 2017). As of 2019, there were 1.59 billion active users visiting Facebook every day (Facebook, n.d.). Facebook allows users to add friends to their friend list, create and like pages, join groups, play games, and message friends. It supports text-based, video, and image posts. Users are then able to comment, like, or share the posts. In addition to individual profiles, Facebook offers options such as brand pages and groups (Scott, 2013). Pages are a public landing page for a brand. Users can like the page and comment on the brand's posts but are not allowed to create posts themselves. Groups can be public or private and are more exclusive. Facebook groups allow for customer creation and conversation.

Instagram was launched in October 2010 and is a social media platform that allows users to share photos and videos with their followers (Vrana et al., 2018). Visual-based platforms such

as Instagram are more beneficial than text-based platforms when recalling information (Arceneaux & Dinu, 2018). At the time this study was written, Instagram has over 200 million users that visit brand profiles every day and over 25 million brand accounts (Newberry, 2019b). Facebook acquired Instagram in 2012 but, unlike Facebook, Instagram users can only post photos to their feed and stories through a mobile application, making it a truly on-the-go social media platform (Lee et al., 2015). Instagram makes use of hashtags (#) for categorizing posts. Users can follow individual accounts or hashtags that will then appear on their home pages. Instagram also allows users to post stories, where the posted photo or video disappears after 24 hours unless the user adds the story to their story highlights. Story highlights remain on the user's profile until deleted.

Twitter is a microblog social media platform that allows users to 'tweet', or share, a 280-character maximum message with their followers. Twitter is rather minimalistic and simple to use. On Twitter, users can perform several actions. They can tweet, retweet, quote tweet, reply, like, share a tweet privately with their friends, or send other private messages. Hashtags are common on Twitter and are used to "isolate conversations and designate themed discussions" (Golden, 2011, p. 194). They allow users to engage with certain topics and form relationships (Zappavigna, 2017). Users, including brands and individuals, can create custom hashtags to include in their posts which makes it easy to locate posts about a certain topic. According to Twitter, users should be compelling enough to entice other users to connect and engage (Alton, 2017). Twitter allows users to connect with friends or with strangers (Chen, 2011). There are many factors that influence engagement including the use of photos, videos, links, and hashtags. Twitter led to the creation of many of the hashtag campaigns that ISLIs have used. Twitter users are driven by the convenience and entertainment factors of Twitter (Alhabash & Ma, 2017).

Social Media Analytics

Regularly posting on social media requires time and commitment because accounts need to be updated and managed properly or the audience will lose interest and become passive (Fletcher & Lee, 2012). Social media analytics are necessary because they can help an organization determine if its social media campaign is effective (Sponder, 2012). Organizations can analyze data to determine their levels of trust, commitment, control mutuality, and satisfaction with their publics. They can do this by examining activity metrics, engagement metrics, audience metrics, referral metrics, and return on investment (King, 2015). Activity metrics count the number of posts and make note of when content was posted and how often. Engagement metrics examine the activities between an organization and its public. These metrics look at the number of comments, likes, and views. Audience metrics measure followers and growth. Referral metrics can be used to determine how many users click hyperlinks, hashtags, or mentions that take them to a different website.

Social media analytics are meant to determine social media return on investment (ROI), how to engage and identify with social media users, and determine the tactics that can be used to create effective campaigns on social media (Fan & Gordon, 2014). It is important for social media managers to measure and analyze engagement on social media to adjust content to audience preferences and determine ROI. These metrics can determine if social media posts lead to an increase in sales, customers, or visitors (Sponder, 2012). ROI in social media sites can be measured with page views, number of fans, engagement, and level of interaction (Camarero et al., 2018). According to Paine (2011), there are five ways to measure ROI. Organizations can measure sales and revenue including donations and ticket sales, their cost savings, paid and earned search rankings, cost avoidances, and social capital such as their relationships. Along

with ROI, organizations should establish key performance indicators (KPIs). KPIs can be used to monitor the progress of a campaign, measure effectiveness, and track likes, clicks, sales, retweets, and other metrics (Rohm & Weiss, 2014). Although social media analytics are important, analytical software may fail to capture emotions and feelings; therefore, it is necessary to have an individual analyze content to determine public sentiment (Sponder, 2012).

The present study will focus on examining social media engagement on Twitter because of its wide user base and multiple usages. Many organizations prefer to use Twitter to create an online community and encourage discussion (Lopez et al., 2017); however, according to Lovejoy et al. (2012), Twitter is a “social media outlet being hyped for relationship building efforts that public relations practitioners do not fully perceive” (p. 316). One of the many benefits of using Twitter for customer engagement is the immediate feedback that can be provided by users (Comm & Taylor, 2015). This means an organization can ask a question, propose a challenge, or share information that users can respond to immediately.

Social Media Engagement

Successful social media use comes from creating conversations and communities through engagement (Comm & Taylor, 2015). In public relations, engagement refers to connecting with people by providing them with content that they find relevant and interesting that then gets them to take action (Goodman, 2012). Engagement occurs when organizations and publics “interact along continua that range from passive to active and from control to collaboration, and is aimed at goal attainment, adjustment, and adaptation for both publics and organizations” (Dhanesh, 2017, p. 931). According to Cheng (2018), social media engagement can enhance organization public relations. Rohm and Weiss (2014) claim that customer engagement is “the DNA of effective social media strategy” (p. 18). Organizations engage by creating relationships with

audiences that are active and interested in their content (Bowen, 2013). There are cognitive, affective, and behavioral dimensions associated with engagement (Frank et al., 2004). Cognitive dimensions refer to the mental states that consumers experience during engagement and includes elements of absorption and attention. Affective dimensions are the emotions experienced during engagement. Behavioral dimensions can include sharing, learning, or endorsing an organization. One of the main objectives for organizations that use social media is to have an engaged consumer base (Dessart et al., 2015).

Engagement on social media is essential because it is the first step in relationship building, and can be used to promote a brand and protect the brand from negativity, help improve a product or service through social listening, and increase attendance, membership, donations, and revenue (Paine, 2011). Dhanesh (2017) notes that engagement through two-way communication is strongly recommended. Furthermore, Dhanesh (2017) also notes that many public relations and social media professionals have concerns about social media, engage primarily in one-way communication, and are not using social media to its fullest capabilities; therefore, organizations should be aware of the benefits that come from social media engagement (Dhanesh, 2017). For example, oftentimes, engagement online can lead to engagement offline. Brands can improve their engagement metrics by focusing on relationship building behaviors. Goodman (2012) suggests five types of engaging content: (1) question and answer, (2) sharing and information, (3) discussions, (4) promotions, and (5) news and announcements. Calder et al. (2009) suggest that engaged individuals online are people that visit a particular website often, spend time on the website, and view pages on the website; individuals who are highly engaged with brands and organizations on social media are more likely to be responsive to advertising efforts. There are many types and definitions of engagement, but Dessart et al. (2015) note that

there are two primary types of online engagement: (1) customer engagement and (2) brand engagement.

Customer Engagement

Customer engagement behavior suggests that a competitive advantage is given to those who can sustain, retain, and nurture their customers and can be characterized by interactions that strengthen a customer and organization's emotional, physical, or psychological investment in each other (Harrigan et al., 2017). It captures "how and why customers behave in numerous ways that are relevant to the firm and its multiple stakeholders" (van Doorn et al., 2010, p. 253). The five dimensions of customer engagement behavior are valence, modality, scope, global or local, and customer goals (van Doorn et al., 2010). Valence refers to the positive or negative attitudes an individual has toward a brand or organization. Modality represents the different ways individuals can express engagement, as well as the resources customers may utilize to engage. Scope can be temporal or geographic. In other words, if the engagement is a one-time or ongoing action. Global or local refers to the nature of impact as well as the immediacy, intensity, breadth, and longevity of impact. Customer goals are how extensively the engagement is planned and explains if the customer's goals are aligned with the firm's goals.

According to van Doorn et al. (2010), there are several antecedents to customer engagement behavior. Customer-based antecedents include satisfaction, trust or commitment, identity, consumption goals, resources, and perceived costs or benefits. Firm-based antecedents consist of brand characteristic, firm reputation, firm size or diversification, firm information usage and processes, and industry. Context-based antecedents can be competitive factors, political, economic, environmental, social, or technological. These antecedents lead to customer engagement behavior, which then leads to consequences. Consequences that affect the customer

can be cognitive, attitudinal, emotional, physical, or based on identity. Consequences for the firm can be financial, reputational, regulatory, competitive, employee, or product. There are also several other consequences including customer welfare, economic surplus, social surplus, regulation, cross-brand, and cross-customer.

Brand Engagement

Brand engagement focuses on customer's engagement with the brand as opposed to their engagement with other customers (Dessart, 2017). Antecedents of brand engagement include social media involvement, brand communication, brand attachment, commitment, and trust (Gomez et al., 2019). Social media involvement refers to the perceived relevance a person feels towards a brand based on their inherent needs, interests, and values. It suggests that the brand is important, meaningful, relevant, and interesting to the consumer. Brand engagement and involvement are both "relational variables that predict consumer outcomes" (Gomez et al., 2019, p. 198). Brand communication impacts brand equity and brand loyalty. Social media allows for communication to play a more prominent role between brands and consumers because consumers are active participants on social media. Individuals can communicate with brands on social media by seeking information and creating content. Brand attachment is a cognitive and affective attachment between a consumer and brand (Taghipourian & Bakhsh, 2015). Brand commitment and trust are important in the creation, development, and maintenance of relationships between consumers and brands (Lacey & Morgan, 2009). Commitment refers to a pledge of relational continuity and trust is the belief a customer has that the brand is reliable and sincere. Outcomes of brand engagement can be trust, loyalty, and purchase intention (Brodie et al., 2013; Dessart, 2017; El-Manstrly & Harrison, 2013; Harrigan et al., 2017; van Asperen et al., 2018).

Trust

Trust is one of the primary issues in building relationships (Calefato et al., 2015) and is the willingness an individual has to rely on an “exchange partner” they are confident in (Moorman et al., 1992, p. 315). Organizations that are trusted have a better organizational reputation (Yang, 2007). There are four dimensions to trust: (1) competence, (2) dependability, (3) integrity, and (4) transparency (Yang & Lim, 2009). Higher levels of these dimensions can increase trust. According to Hong and Rim (2010), individuals who use an organization’s website to gather information tend to have higher levels of trust in that organization and that trust is “positively associated with their engagement in positive word-of-mouth communication” (p. 390).

Loyalty

In public relations, loyalty is a “natural byproduct of building and maintaining mutually beneficial relationships through two-way communication” (Stoker, 2005, p. 269) and is one of the most reliable ways to determine the success of an organization (Hsieh & Li, 2007). Loyalty is a commitment to continue purchasing or patronizing a preferred product or service in the future, despite influences attempting to switch the behavior (Oliver, 1999). For nonprofit organizations, which includes many ISLIs, loyalty is among the most important variables in managing relationships (Pressgrove & McKeever, 2016). It can lead to positive recommendations, competitive advantage, and a reduction of marketing costs (Gounaris & Stathakopoulos, 2003). Loyalty can be divided into multiple categories including affective and conative loyalty. Affective loyalty consists of an audience member’s favorable attitudes toward the brand (El-Manstrly & Harrison, 2013). Conative loyalty refers to an audience member’s intention to

continue supporting a brand. This type of loyalty refers to the behavior of a consumer (Oliver, 1999).

Purchase Intention

Purchase intention is simply the willingness an individual has to purchase a product (Byrum, 2017). Purchase intention for ISLIs can refer to purchasing memberships, tickets, merchandise, making monetary donations, or anything else the ISLI sells. Pope and Voges (2000) found that a consumer's intention to purchase is influenced by the consumer's positive attitude toward the brand and the consumer's familiarity with the brand. In addition to familiarity and attitudes, involvement on social media also leads to greater purchase intentions (McClure & Seock, 2020). Purchase intention can also be influenced by "social media marketing and customer relationships" (Gautam & Sharma, 2017, p. 884)

The engagement outcomes of trust, conative loyalty, affective loyalty, and purchase intention are important for ISLIs because they help form, maintain, and strengthen relationships between the ISLI and the audience on social media. This study will use brand engagement to examine the relationship between an individual's motivations to engage and the outcomes of trust, conative loyalty, affective loyalty, and purchase intention. Brand Engagement will be explored using the consumers' online brand-related activities concept as well as uses and gratifications theory which can help explain how and why individuals choose to engage with ISLIs on Twitter, respectively.

Consumers' Online Brand-Related Activities

Consumers' online brand-related activities (COBRA) is a concept that was created to explain how users engage with brands and brand-related content on social media (Vale & Fernandes, 2018). The COBRA concept is "a behavioral construct the provides a unifying

framework to think about consumer activity pertaining to brand-related content on social media platforms” (Muntinga et al., 2011, p. 14). COBRA assesses how social media allows individuals to shift from a being a passive consumer of content to active creators and contributors (Schivinski et al., 2019).

There are multiple ways individuals can use social media. Individuals can use social media for consumption, contribution, or creation. Consumption is the lowest level of engagement and consists of simply viewing posts, clicking links, or reading comments. Users who consume are not actively participating in social media (Schivinski et al., 2016). Information, entertainment, remuneration, and social interaction have been linked to consumption (Muntinga et al., 2011; Vale & Fernandes, 2018). Contribution is the middle level of engagement. Contributors interact with other users and the brand by liking, sharing, and commenting on posts or updates. Entertainment, remuneration, identity, social interaction, and empowerment can be motivators of contributors. Creation refers to the highest level of engagement. Creators on social media actively produce and publish content related to the brand. Creators are motivated by entertainment, remuneration, social identity, interaction, empowerment, and brand love. Depending on the situation and content, individuals may act as consumers, contributors, and creators for the same brand (Schivinski et al., 2016). According to de Vries et al. (2017), it is essential for organizations to understand what motivates users to participate in contributing and creating activities because these actions lead to higher levels of engagement. These motivations can be explained using uses and gratifications theory.

Uses and Gratifications Theory

Uses and gratifications theory is the theoretical framework for the current study. The theory was created in the 1940s as an attempt to determine how and why individuals seek certain

media, such as reading the newspaper or listening to the radio (Ruggiero, 2000). At its conception, uses and gratifications theory was descriptive and was used to classify individuals into categories and describe their motives. Research was focused on studying what media satisfies an individual's psychological and social needs (Katz et al., 1973). Uses and gratifications research in the 1950s and 1960s called to focus psychological and social variables that led to different consumption patterns. Maslow's (1954) hierarchy of needs became a base for uses and gratifications research. The five sets of needs are psychological needs, needs for safety, needs for belonging and love, needs for esteem, and needs for self-actualization (Rosengren, 1974). Research that was conducted in the 1950s and 1960s aimed to discover if mental capacities and relationships with parents and peers influenced how children use television (Schramm et al., 1961), how mass media is used as a form of escapism (Katz & Foulkes, 1962), and how listening to the radio can be used for information, companionship, mood, boredom, and social interaction (Mendelsohn, 1964). Klapper (1963) called for a more functional and observable approach to uses and gratifications which placed an emphasis on the consequences of uses. Functional analyses are concerned with "standardized, patterned, and repetitive social phenomena" (Wright, 1974, p. 198). This led uses and gratifications researchers to begin working with psychologists. In the 1970s, researchers shifted from focusing on gratifications sought to gratifications received, outcomes, and motivations. The psychological motives were more prevalent than in previous years and researchers paid greater attention to the audience (Weiyan, 2015). There were several criticisms to the uses and gratifications theory during this period, including a poor conceptual framework, lack of precision, and leaving out the audience's perspective (Ruggiero, 2000). Researchers in the 1980s and 1990s sought to refine, modify, and replicate existing studies, refine the methodology, analyze findings of separate studies, and use

mass media as a social and communication phenomenon. This time period focused greatly on the active audience.

There are five assumptions associated with uses and gratifications (Rubin, 2009). According to Blumler (1979), an active audience consists of utility, intentionality, selectivity, and imperviousness to influence; therefore, the first assumption is that individuals are active and choose what media and content they consume. Communication is goal-directed and motivated. The second assumption is that people take initiative to select and use communication to satisfy their needs and wants. Third, people are motivated to use certain communication behaviors by psychological and social factors. Fourth, media compete with multiple other forms of communication, such as face-to-face interpersonal communication, to satisfy our needs. Finally, people generally have more influence on the media than media has on people. Uses and gratifications theory suggests that “individuals seek out media that fulfill their needs and leads to ultimate gratification” (Whiting & Williams, 2013, p. 362). There are two types of media orientations: (1) ritualized and (2) instrumental (Haridakis & Whitmore, 2006). Ritualized media use refers to an individual using media to pass time. Instrumental suggests that individuals use media purposively and to gather information.

New media adds a new layer to uses and gratifications theory because of its interactivity, demassification, and asynchronicity (Ruggiero, 2000). Interactivity refers to the amount of control communicators have over their communication process, which strengthens the idea of the active user (Weiyan, 2015). There are six dimensions of interactivity: (1) complex choices, (2) users must exert effort, (3) media is responsive to the user, (4) information use is monitored, (5) ease of contributing, and (6) interpersonal communication (Heeter, 1989). Demassification refers to the control an individual has over the media they select. New media allows individuals to

select messages in the media that fit their needs (Weiyan, 2015). Asynchronicity is the “concept that messages may be staggered in time” (Ruggiero, 2000, p. 16). Users can send, receive, and respond to messages at their own convenience. These dimensions of uses and gratifications theory in new media are important aspects of engagement.

There are multiple typologies of uses and gratifications developed from previous research. Rubin (1981) mentioned passing time, excitement, companionship, enjoyment of specific content, escapism, interaction, information, relaxation, and entertainment as motivations for media use. Dolan et al. (2016) mentioned informational, entertaining, remunerative, and relational content as uses for social media. Phua et al. (2017) highlight the difference between motivations to use different social media platforms. For example, they found that Facebook is used primarily for entertainment, diversion, communication, information, social maintenance, making connections, passing time, sharing problems, and recreation.

There are many different criteria used to measure uses and gratifications because the needs for media use can stem from social or personal motivations (Jimenez et al., 2012). This means that every person and every situation will have different experiences with media. Information seeking, entertainment, personal identity, social interaction, empowerment, remuneration, and brand love have been listed as reasons people use social media (Vale & Fernandes, 2018). Information seeking involves seeking advice, searching for recommendations, and making sense of items (Gao & Feng, 2016). It also consists of finding relevant events, learning about society, seeking advice, curiosity, general interests, and knowledge (Calder et al., 2009). Users may also seek to learn information directly about a brand or organization. According to Dolan et al. (2016) “searching for and receiving information about a brand is one of the main gratifications of consumer participation in online brand communities” (p. 263).

Entertainment refers to using social media to browse for interesting content, share experiences, vent, gossip, escape, or to fill time as well as for relaxation, emotional release, and cultural enjoyment. Entertaining content can lead to positive attitudes towards the brand (Taylor et al., 2011). Personal identity refers to “shaping one’s identity through self-expression and self-presentation by providing an image of one’s personality” (Vale & Fernandes, 2018, p. 41). Social interaction consists of social support, forming and maintaining relationships, commenting, sharing, liking, developing common ground, enhancing connectiveness, social empathy, insight into others, a sense of belonging, connection with friends and family, and replacing real-life conversation. Empowerment relates to the need to influence other people. Social media is a place where individuals can voice their unique opinion that can alter the brand’s or other user’s experience. Remuneration means receiving a reward for engagement, such as monetary compensation, prizes, giveaways, or exclusive coupons. Brand love refers to an individual’s strong affectionate feelings regarding a brand. These motivations for using social media have been linked to consumers’ online brand-related activities.

According to Clavio and Walsh (2014), uses and gratifications theory “encourages researchers to directly communicate with users in order to ascertain what media they are selecting, and which wants and needs those media choices are satisfying” (p. 263). The present study contributes to uses and gratifications theory because the research will apply uses and gratifications theory to social media engagement and examine why individuals choose to engage with ISLIs on Twitter, which has not previously been studied.

In attempt to discover what motivates individuals to engage with ISLIs on social media, the following hypotheses are proposed:

H1: An individual's need for information, entertainment, personal identity, social interaction, empowerment, remuneration, and brand love motivates them to engage with informal science learning institutions through consuming on social media.

H2: An individual's need for information, entertainment, personal identity, social interaction, empowerment, remuneration, and brand love motivates them to engage with informal science learning institutions through contributing on social media.

H3: An individual's need for information, entertainment, personal identity, social interaction, empowerment, remuneration, and brand love motivates them to engage with informal science learning institutions through creating on social media.

H4: An individual's need for information, entertainment, personal identity, social interaction, empowerment, remuneration, and brand love on Twitter will increase an individual's trust of ISLIs.

H5: An individual's need for information, entertainment, personal identity, social interaction, empowerment, remuneration, and brand love on Twitter will increase an individual's conative and affective loyalty to ISLIs.

H6: An individual's need for information, entertainment, personal identity, social interaction, empowerment, remuneration, and brand love on Twitter will increase an individual's purchase intention in regard to ISLIs.

Summary

In this chapter, the researcher provided an overview of key academic literature including organization public relations, social media, and social media engagement. The framework for this study was explored via a discussion of COBRA and uses and gratifications theory. As a

result, six hypotheses were posited. The next chapter will contain a description of the methodology being used to answer the research questions in the present study.

CHAPTER III

METHODOLOGY

Chapter two included detailed descriptions of organization public relations, social media, social media engagement, COBRA, and uses and gratifications theory and concluded with six hypotheses. This chapter will include information regarding the participants, data collection process, and method of analysis for the present study. The research conducted in this study will assist ISLIs in determining the type of content that is most engaging on Twitter. The quantitative design of this study will be beneficial for generalizing results across many ISLIs. In this study, the researcher will seek to understand the relationships between Twitter users and ISLIs. The researcher will examine what content Twitter users seek from ISLIs, what content Twitter users find most engaging, what will result in Twitter users' decision to consume, contribute, and create content, and how engagement motivations affect the relationship between ISLIs and the audience.

Data Collection

Sampling

Upon receiving approval from the Institutional Review Board (IRB), participants for this study were recruited using the following social media platforms: (1) Facebook, (2) Twitter, and (3) LinkedIn. Although this study focuses solely on Twitter use, recruitment occurred on these social media platforms to reach a larger audience. According to Newberry (2019a), the average American has more than seven social media accounts. This means it is likely that Facebook and Instagram users will also have a Twitter account. Purposive sampling guided the criteria for participation in this study which required participants to be over the age of 18 and currently following at least one ISLI on Twitter. A script approved by the IRB (see Appendix 1) was

posted on the author's personal social media pages including Facebook, Twitter, and LinkedIn. On Facebook, the author shared a post that included the approved script and a link to the survey. The author made the post publicly available and shareable to encourage snowball sampling. Participants were also recruited through Facebook groups focused around science, social media, communication, and education. Examples of these groups include "Ologies Podcast," a group with over 11,000 members who listen to the science podcast "Ologies," and "ISEA – Informal Science Education Association of Texas," a group with over 700 members that aims to connect museum, zoo, and aquarium educators in Texas. The approved script and link were also posted on the author's Twitter profile. The author encouraged individuals who saw the posts to share or retweet the survey with their followers. The last social media platform used was the author's LinkedIn. This post also included the approved script and a link to the survey. In addition to social media, participants were recruited using word-of-mouth and an approved flyer with a QR code that sends prospective participants directly to the survey when it is scanned. Finally, the author emailed an approved script and link to the survey to various communication specialists, social media managers, and marketing professionals at ISLIs in the United States. These ISLIs included the Aquarium of the Pacific, the Audubon Nature Institute, and SeaWorld San Antonio because they are prominent ISLIs with active Twitter accounts.

Participants

A total of 165 participants completed the survey with a response rate of 52%. The sample consisted of 30% males (N=50) and 70% females (N=115). Participants' ethnicities consisted of 82% Caucasian/White (N=135), 1% African American/Black (N=2), 13% Hispanic/Latino (N=21), 4% Asian American/Asian (N=6), and 0.6% who marked "other" (N=1). A total of 41% of participants reflected on zoos (N=67), 33% of participants reflected on aquariums (N=55), and

25% of participants reflected on museums (N=41). The most frequent ISLIs that participants chose to reflect on were the Monterey Bay Aquarium (N=25) and the Texas State Aquarium (N=10).

Instruments

Data were collected using an online Qualtrics survey that assessed the participants' use of social media. Upon clicking the link or scanning the QR code to the survey, participants were asked to read a consent form prior to moving on with the survey (see Appendix 2). After providing consent to participate in the study, participants were asked to reflect on one ISLI that they follow on Twitter as they responded to the survey. A series of six demographic questions were asked concerning the participant's age, gender, ethnic background, as well how many ISLIs they follow on Twitter, the type of ISLI they are reflecting on, and which ISLI the participant was reflecting on during survey completion. The survey consisted of 52 questions about engagement motivations, behaviors, and outcomes (see Appendix 3). Participants took an average of 12.4 minutes to complete the full survey.

The first three hypotheses are concerned with how social media users' motivations (i.e., uses) impact their engagement with ISLIs on Twitter (i.e., gratifications). To measure social media users' motivations, a modified version of Vale and Fernandes' (2018) Drivers of Consumer Engagement on Social Media instrument was used. The dimensions of Vale and Fernandes' (2018) instrument were adapted from Albert et al. (2009), Baldus et al. (2015), Hur et al. (2007), Muntinga (2013), Schivinski et al. (2016), and Seo and Green (2008). This instrument asks participants to use a 7-point Likert-type scale (1 = *strongly disagree* to 7 = *strongly agree*) to describe their motivations for interacting with on social media across seven dimensions (information, entertainment, personal identity, integration and social interaction, empowerment,

remuneration, and brand love). The instrument items were modified to refer to ISLIs instead of football clubs. The measure included items such as “The scientific information posted was helpful,” “I like following this account because it is entertaining,” “This account provides an outlet for me to escape my daily routine,” “I follow this account to express what kind of person I am,” “I look forward to talking, discussing, and sharing information with others that also like the ISLI,” “I want to influence the ISLI to do or not do something,” “When I want to visit the ISLI, I use the ISLI’s Twitter to search for better prices or coupons,” and “I’m motivated to engage with the ISLI because I am passionate about the ISLI.” The Cronbach’s alpha reliability coefficients for the measures in Vale and Fernandes’ (2018) study were: Information ($\alpha=.73$); Entertainment ($\alpha=.81$); Personal Identity ($\alpha=.82$); Integration and Social Interaction ($\alpha=.77$); Empowerment ($\alpha=.84$); Remuneration ($\alpha=.76$); and Brand Love ($\alpha=.85$). The Cronbach’s alpha reliability coefficients, means, and standard deviations for the present study were: Information ($\alpha=.68$, $M=5.09$, $SD=1.08$); Entertainment, ($\alpha=.88$, $M=5.15$, $SD=1.34$); Personal Identity ($\alpha=.82$, $M=3.28$, $SD=1.36$); Integration and Social Interaction ($\alpha=.79$, $M=4.43$, $SD=1.19$); Empowerment ($\alpha=.85$, $M=3.89$, $SD=1.37$); Remuneration ($\alpha=.80$, $M=3.62$, $SD=1.36$); and Brand Love ($\alpha=.84$, $M=4.62$, $SD=1.27$).

A modified version of Vale and Fernandes’ (2018) Drivers of Consumer Engagement on Social Media instrument was also used to measure how individuals use Twitter to engage with ISLIs. This instrument asks participants to use a 7-point Likert-type scale (1 = *strongly disagree* to 7 = *strongly agree*) to describe their consuming, contributing, and creating engagement behaviors on Twitter. The measure included items such as “I read the content posted by the ISLI on Twitter,” “I retweet content posted by the ISLI on Twitter,” and I post pictures, videos, or personal images related to the ISLI on Twitter.” The Cronbach’s alpha reliability coefficients for

these measures in Vale and Fernandes' (2018) study were: Consuming Activities ($\alpha=.82$); Contributing Activities ($\alpha =.78$); and Creating Activities ($\alpha =.82$). The Cronbach's alpha reliability coefficients, means, and standard deviations for the present study were: Consuming Activities ($\alpha=.81$, $M=5.50$, $SD=1.08$); Contributing Activities ($\alpha =.83$, $M=4.25$, $SD=1.40$); and Creating Activities ($\alpha =.91$, $M=2.86$, $SD=1.53$).

Several brand engagement outcomes were measured to determine how an ISLI's efforts to engage followers on Twitter impact the participants' trust, loyalty, and purchase intention toward the brand.

Trust was measured with the brand trust instrument (Delgado-Ballester et al., 2003) using a 7-point scale that assessed four items. The statements given were "This ISLI meets my expectations," "I feel confident in this ISLI," "This ISLI never disappoints me," and "This ISLI guarantees satisfaction." Answers ranged from *strongly disagree* (1) to *strongly agree* (7). The previous Cronbach's alpha reliability coefficient was .81 (Delgado-Ballester et al., 2003). The Cronbach's alpha reliability coefficient for this study was .85 ($M=5.52$, $SD=1.08$).

Affective loyalty was measured using the customer loyalty and social media engagement instrument (van Asperen et al., 2018) with a 7-point scale that assessed four items. The statements given were "This ISLI means a lot to me," "I am very attached to this ISLI," "It would be difficult to change my beliefs about this ISLI," and "Even if close friends recommended another ISLI, I would not change my preference." Answers ranged from *strongly disagree* (1) to *strongly agree* (7). The previous Cronbach's alpha reliability coefficient was .88 (van Asperen et al., 2018). The Cronbach's alpha reliability coefficient for this study was .82 ($M=4.73$, $SD=1.20$).

Conative loyalty was measured using the customer loyalty and social media engagement instrument (van Asperen et al., 2018) with a 7-point scale that assessed four items. The statements given were “I would recommend this ISLI to people who seek my advice,” “I would tell other people positive things about this ISLI,” “I would recommend this ISLI to my friends”, and “I would engage with this ISLI again.” Answers ranged from *strongly disagree* (1) to *strongly agree* (7). The previous Cronbach’s alpha reliability coefficient was .97 (van Asperen et al., 2018). The Cronbach’s alpha reliability coefficient for this study was .94 ($M=5.90$, $SD=1.03$).

Purchase intention was measured using a 7-point scale that assessed two items as proposed Bryum (2017). The statements given were “I would be willing to visit this ISLI,” and “I would tell other people positive things about this ISLI.” Answers ranged from *strongly disagree* (1) to *strongly agree* (7). The previous alpha reliability coefficient was .73 (Bryum, 2017). The Cronbach’s alpha reliability coefficient for this study was .91 ($M=6.26$, $SD=0.98$).

Data Analysis

Following data collection, the data were inputted into SPSS and analyzed using a canonical correlation. According to Thompson (1984), a canonical correlation “is employed to study relationships between two variable sets when each variable set consists of at least two variables” (p. 10). The independent variables in this study were information, entertainment, personal identity, social interaction, empowerment, remuneration, and brand love. These independent variables were used to predict the ways in which individuals engage with ISLIs on Twitter including consumption, contribution, and creation as well as the outcomes of brand engagement such as trust, affective loyalty, conative loyalty, and purchase intention. In a canonical correlation, roots are the functions of output (Sherry & Henson, 2005). There are as many roots as there are dependent variables. The first root is meant to maximize the correlation

and explain the majority of variance between the variables. Additional roots are created until the variables are uncorrelated. Analysis is only performed on the roots that “explain a reasonable amount of variance between the variable sets” (p. 42).

The hypotheses regarding individuals’ motivations to engage with ISLIs on Twitter and their Twitter engagement behaviors were each tested with separate canonical correlation analyses. For both canonical correlations analyses, the seven motivations served as the predictor variables and the engagement variables served as the dependent variables. Canonical correlation was utilized instead of numerous Pearson Product-Moment Correlations in an effort to reduce type 1 error that could result from conducting an inordinate number of bivariate correlations (Sherry & Henson, 2005). Only canonical correlates that reached .45 or higher were examined within this study (Sherry & Henson, 2005).

Summary

In this chapter, the author provided a detailed explanation of the research process that was conducted. Participants over the age of 18 that follow an ISLI on Twitter were recruited to participate in a quantitative survey that measured uses and gratifications, COBRA, and brand engagement. The data were analyzed using a canonical correlation in SPSS. Results of the data analysis are presented in the following chapter.

CHAPTER IV

RESULTS

In chapter three, the method for collecting data was presented. The author recruited participants to take a quantitative survey and analyzed the data using canonical correlations. In the current chapter, the results of the data analysis are presented.

Hypothesis one posited that an individual's need for information, entertainment, personal identity, social interaction, empowerment, remuneration, and brand love motivates them to engage with informal science learning institutions through consuming on social media.

Hypothesis two posited that an individual's need for information, entertainment, personal identity, social interaction, empowerment, remuneration, and brand love motivates them to engage with informal science learning institutions through contributing on social media.

Hypothesis three posited that an individual's need for information, entertainment, personal identity, social interaction, empowerment, remuneration, and brand love motivates them to engage with informal science learning institutions through creating on social media. The canonical correlation used to test hypotheses one, two, and three about the relationship between individuals' motivations and their engagement revealed two significant roots (Wilks' $\lambda = .36$, $F(21, 327.9) = 6.67$, $p < .001$). The first canonical root ($R_c = .67$) revealed that individuals reporting high levels of information, entertainment, personal identity, integration and social interaction, empowerment, remuneration, and brand love motivations to engage with ISLIs on Twitter were more likely to create, contribute, and consume content. The second canonical root ($R_c = .57$) revealed that individuals reporting high levels of information, entertainment, and integration and social interaction motivations to engage with ISLIs on Twitter were more likely to consume content. Thus, the first three hypotheses were fully supported (See Table 1).

Table 1

Canonical Correlation Involving Motivations and Engagement

Variables	Canonical Loadings	
	R_{c1}	R_{c2}
<u>Set 1: Motivations</u>		
Information	-.53	-.67
Entertainment	-.51	-.61
Personal Identity	-.69	-.01
Social Interaction	-.78	-.44
Empowerment	-.89	.15
Remuneration	-.58	.11
Brand Love	-.63	-.16
Redundancy Coefficient	[.45]	[.15]
<u>Set 2: Engagement</u>		
Consuming	-.48	-.87
Contributing	-.87	-.19
Creating	-.93	.25
Redundancy Coefficient	[.27]	[.09]

Note. Wilks' $\lambda = .36$, $F(21, 327.9) = 6.67$, $p < .001$. Canonical loadings (r_s) greater than .45 are in bold.

Hypothesis four posited that engagement on Twitter will increase an individual's trust of ISLIs. Hypothesis five posited that engagement on Twitter will increase an individual's brand loyalty of ISLIs. Hypothesis six posited that engagement on Twitter will increase an individual's purchase intention in regard to ISLIs. The canonical correlation used to test hypotheses four, five, and six about the relationship between individuals' motivations and their trust, affective loyalty, conative loyalty, and purchase intention revealed two significant roots (Wilks' $\lambda = .32$, $F(28, 390.82) = 5.13$, $p < .001$). The first canonical root ($R_c = .67$) revealed that individuals reporting high levels of information, entertainment, personal identity, integration and social interaction, empowerment, and brand love motivations to engage with ISLIs on Twitter experience high levels of reliability trust, affective loyalty, conative loyalty, and purchase intention. The second canonical root ($R_c = .52$) revealed that individuals reporting high levels of

information and entertainment motivations experience high levels reliability trust, conative loyalty, and purchase intention. Thus, hypotheses four, five, and six were supported (See Table 2).

Table 2

Canonical Correlation Involving Motivations and Engagement Outcomes

Variables	Canonical Loadings	
	R_{c1}	R_{c2}
<u>Set 1: Motivations</u>		
Information	-.57	.45
Entertainment	-.54	.54
Personal Identity	-.59	-.30
Social Interaction	-.85	.10
Empowerment	-.46	.32
Remuneration	-.28	.25
Brand Love	-.88	-.17
Redundancy Coefficient	[.39]	[.11]
<u>Set 2: Engagement Outcomes</u>		
Trust	-.65	.51
Affective Loyalty	-.96	-.25
Conative Loyalty	-.80	.53
Purchase Intention	-.69	.51
Redundancy Coefficient	[.30]	[.06]

Note. Wilks' $\lambda = .32$, $F(28, 390.82) = 5.13$, $p < .001$. Canonical loadings (r_s) greater than .45 are in bold.

Summary

This chapter contains a summary of the results of the research. Hypotheses one through six were supported with significant findings. The motivations of information, entertainment, and integration and social interaction were most strongly related to consumption activities.

Information and entertainment motivations were also strongly correlated with trust, conative loyalty, and purchase intention. In the following chapter, the results will be discussed in further detail.

CHAPTER V

DISCUSSION

In previous chapters, a review of the literature, methods, and results of the study were discussed. In the final chapter, the results will be examined in further detail, the scholarly implications and limitations of the study will be discussed, and ideas for future research will be presented.

The purpose of the current study was to identify the types of content that ISLIs can post on Twitter to encourage engagement and how that engagement affects the relationship between ISLIs and their followers. Uses and gratifications theory, consumers' online brand related activities, and brand engagement outcomes were used to examine the effects of engagement.

The results of this study indicate that individuals that use Twitter to gather information, fulfill needs for entertainment, to express their personal identity, fulfill their need for social interaction, to feel empowered, for remuneration, and to express brand love do so through consuming, contributing, and creating content on Twitter. This means that the followers of ISLIs are generally interested in any content an ISLI posts. Typically, individuals will only follow accounts that post content they are interested in, meaning they would most likely enjoy anything the account posts. These findings are consistent with previous studies that have identified relationships between motivations and engagement behavior. For example, Vale and Fernandes (2018) found that when it comes to engaging with sport clubs on Facebook, information, integration and social interaction, and brand love are drivers of consumption. They also found that integration and social interaction, empowerment, remuneration, and brand love are motivators of contribution, and that personal identity, integration and social interaction,

empowerment, remuneration, and brand love influence creation. Muntinga et al. (2011) found that entertainment and information are strong motivators to consume, contribute, and create.

The data analysis resulted in the identification of three primary motivations for consuming ISLI's content on Twitter: (1) information, (2) entertainment, and (3) social interaction, as well as two primary motivations for trust, conative loyalty, and purchase intention: (1) information and (2) entertainment. Although consumption behaviors have the lowest levels of engagement, they are not to be ignored. Schivinski et al. (2016) found that consumption can influence "consumer mindsets and, thus, behavior" (p. 75). In other words, although consumers are not actively engaging, they are actively reading, watching, and taking in content which may influence them to eventually contribute and create content. ISLI social media managers should post informative content, such as ticket prices, educational facts, or current exhibits, entertaining content such as jokes, memes, or videos, and socially interactive content such as calls-to-action and community-based content. There have not been many studies conducted that examine the relationship between motivations and engagement outcomes on social media; however, some assumptions can be drawn from the present study.

The first primary motivation was information. The present study found that individuals with a high level of motivation for information are more likely to consume ISLI Twitter content, which is consistent with previous research that suggests the motivation for information can be satisfied without interaction. For example, Muntinga et al. (2011) found that people go online for information and may get their information for surveillance, pre-purchase information, knowledge, or inspiration. Vale and Fernandes (2018) found that information is the main driver of consumption for sport fans. Informative content could lead to trust because users that are motivated by information are expecting accurate information directly from the ISLI (Vale &

Fernandes, 2018). Habibi et al. (2014) found that brands can increase trust by providing customers with information about their brand. According to Laroche et al. (2012), brands that want to enhance loyalty must post informative content, especially informative content that helps “members more optimally use their branded product” (p. 1764). Regarding purchase intention, McClure and Seock (2020) found that the information quality of content on social media can positively influence purchase intention. Some examples of informative content that an ISLI could share for consumption includes facts about animals or exhibits, their hours of operation, livestreams of enrichment sessions, or announcing events. This type of content is meant to teach the followers something about the organization or content within the organization. The American Museum of Natural History will frequently tweet facts about exhibits with links to more information, studies, or their ticket purchasing landing page. These tweets, such as one with hammerhead shark facts posted on March 14, 2020, can gain around 200 likes, 45 retweets, and 4 replies each (American Museum of Natural History, 2020).

The second primary motivation was entertainment. The results of the present study indicated that users with high motivations for entertainment are more likely to consume content. This is consistent with previous studies. Tsai and Men (2013) found that entertainment was one of the most dominant motivations to engage with brands on social media. Muntinga et al. (2011) found that entertainment may be present in consuming, contributing, and creating behaviors; however, when present with consuming behaviors, entertainment can be driven by relaxation, enjoyment, or passing time. Regarding entertainment and conative loyalty, Erdoğan and Çiçek (2012) found that advantageous marketing campaigns on social media that were entertaining were significant drivers of loyalty and that social media is a platform used for escapism and fun. Kim and Ko (2010) found that entertaining marketing methods have a positive impact on trust

and purchase intention. Entertaining content could consist of jokes, memes, and funny videos. Hashtags such as the #VDayPunOff and #AquademyAwards trends mentioned in chapter one are examples of entertaining content. Another example of entertaining content comes from the COVID-19 crisis of 2020 when many ISLIs closed to encourage social distancing. While closed, ISLIs took the opportunity to share content to lighten the mood. The Shedd Aquarium in Chicago let their penguins wander the aquarium with keeper supervision. The penguins watched the dolphins, stingrays, and fish. The videos were posted on Twitter and quickly went viral with a collective 413,000 likes, 116,800 retweets, and 3,809 replies within a month (Shedd Aquarium, 2020). One Twitter user replied “thanks for posting videos of penguins. While we’re ‘confined’ for the most part-it was a bright light in the day. Please entertain us frequently” (7BlackLabs, 2020, n.p.).” This type of content is an example of that which may be consumed for enjoyment.

The results of this study also found that individuals with high levels of motivation for social interaction are more likely to consume ISLI content on Twitter. Socially interactive messages encourage participation, relationship building, and connectivity (Shao, 2008); therefore, engagement should be higher with these posts. The motivation of integration and social interaction for consuming behaviors is inconsistent with previous studies. Muntinga et al. (2011) linked integration and social interaction to contributing and creating behaviors and Vale and Fernandes (2018) found that integration and social interaction needs were the most prominent motivation for consumption, contribution, and creation. One plausible reason for the lack of contributing and creating behaviors of ISLI followers for integration and social interaction may be that the followers may not be very active on Twitter, but they still enjoy following the ISLI to support them. Sun et al. (2014) discussed lurkers in online communities. Lurkers want to be a part of an online community, but may be too shy to actively engage, may

want to preserve their privacy, or may not realize their contribution to engagement is wanted.

ISLIs can promote more active engagement for followers who are motivated by integration and social interaction by providing encouragement and guidance (Sun et al., 2014). Another possible reason ISLI Twitter followers are not motivated by social interaction to contribute and create could be that individuals typically use Twitter for short, immediate messages which, unless the user sets their profile settings to private, can be viewed by anyone on Twitter. The lack of privacy and wide reach of Tweets may be discouraging users to actively create content (Waterloo et al., 2018). The San Diego Zoo utilized socially interactive content that promotes engagement by asking their followers to share the last animal picture on their phone. As of April 2020, this tweet had 280 replies, 610 likes, and 54 retweets (San Diego Zoo, 2020).

Overall, the results of this study indicate that ISLI Twitter followers are interested in information, entertainment, personal identity, social interaction, empowerment, remuneration, and brand love, but are particularly interested in content that provides information, entertainment, and social interaction. It may be useful to combine these three top motivators into one tweet or thread by posting a funny fact with a call-to-action. The Monterey Bay Aquarium frequently utilizes this model by tweeting a meme or interesting video and replying to their own tweet with facts about what was featured in the previous tweet. For example, on March 5, 2020, the Monterey Bay Aquarium tweeted a video of a bioluminescent comb jelly with the caption “Comb jellies put the “disco” in “discovery” (Monterey Bay Aquarium, 2020a). They immediately replied to their tweet by saying “For those of you wondering: The rainbows dancing on the comb jelly's appendages are caused by light diffracting off the surface of their tiny rows of hairs (the famed "combs" of the comb jelly) like the surface of a soap bubble!” (Monterey Bay Aquarium, 2020b). This format will satisfy the motivations of entertainment, information, and

social interaction. As Schivinski et al. (2016) pointed out, consumption, contribution, and creation have a hierarchical relationship meaning publics can move from one level of engagement to another. Although consumption was found to be the primary engagement behavior, it is possible to influence consumers to move up the engagement hierarchy. The results show that individuals are willing to more actively engage through contribution and creation, it just may take a behavioral change that can come from an increase in consumption.

Implications

This study contributes to strategic communication research, specifically regarding social media engagement and public relations by supporting existing claims that uses and gratifications theory can be used to examine engagement on social media (Vale & Fernandes, 2018). The concept of COBRA is still a fairly new concept, as it was only developed in 2011 (Muntinga et al., 2011). Therefore, this research contributes to the literature on COBRA and Twitter engagement. There has also been little research conducted to examine the relationship between motivations to engage and engagement outcomes; therefore, this study fills a gap in knowledge of engagement outcomes.

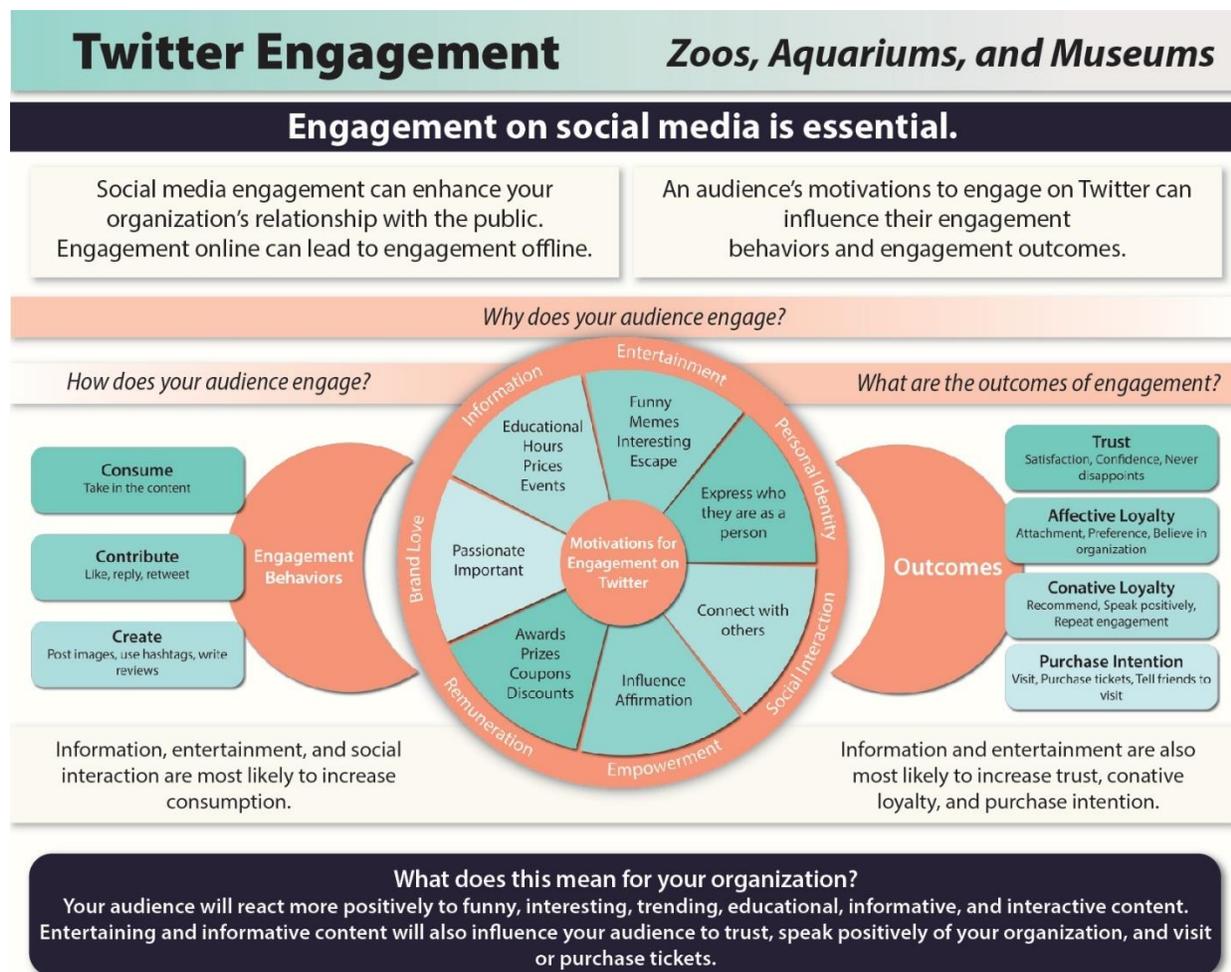
Vale and Fernandes (2018) suggest that effective social media use by an organization requires guidance by gathering insights about motivations from fans. Social media managers can use the knowledge gained from the current research to tailor their Twitter content to best fit their audiences, thus increasing engagement behaviors and enhancing their relationships with their audience. To motivate high levels of consumption, ISLI social media managers should post informative, entertaining, and socially interactive content. According to van Doorn et al. (2010), highly engaged customers can influence and inspire the organization by suggesting changes, interacting with the organization, providing feedback, and developing new ideas. These

suggestions made by engaged followers can make the ISLI more efficient and lead to greater satisfaction. In addition to improving engagement, the results of the current study can help ISLI social media managers improve brand engagement outcomes, especially trust, conative loyalty, and purchase intention.

One of the goals of this study was to bridge the gap between academics and practitioners. To do this, the results of this study can be disseminated to public relations and communication professionals at ISLIs through short videos or easy to understand infographics (see Figure 3).

Figure 3

ISLI Twitter Engagement Infographic Example



Limitations

Although this study allows for a better understanding of how social media content can impact engagement behaviors and outcomes, it is not without limitations. The limitations of this study include the niche market of interested participants, demographics of participants, and study design. The criteria for this study required participants to be active on Twitter and follow at least one ISLI. This severely limited the pool of potential participants. There are some people who like or follow ISLIs on Facebook or Instagram, but not on Twitter; therefore, if the study had also been open to Facebook or Instagram users, the results may have been different. This may have also resulted in a larger sample size. Additionally, 70% of the participants identified as female and 82% of participants were white/Caucasian, which shows a lack of diversity in the sample. The bias towards females is interesting because Mislove et al. (2011) found that approximately 72% of Twitter users identify as male. The results of the study may be skewed towards women's preferences. Regarding race, however, the percentage of white/Caucasian participants is in line with the demographics of Twitter users with 86% being white/Caucasian (Mislove et al., 2011).

As part of the study design, participants were asked to reflect on one ISLI that they follow. This could cause confusion and participants may misremember things about the ISLI or mistakenly reflect on the content of another account. Additionally, focusing on engagement may not represent the interests of the majority of followers. According to Libai (2011), 90% of members of online communities are passive followers, 10% are involved in some way, and only 1% actively engage. Finally, because this was a quantitative survey, there is room for error in self-reporting data. Participants may have misunderstood or misinterpreted some of the questions or answers.

Future Research

Researchers who are interested in social media engagement can apply uses and gratifications theory, COBRA, and brand engagement outcomes to examine different industries and social media platforms other than ISLIs. This study concept could be applied to the sport, travel, hospitality, or craft brewery industries, to name a few.

This study focused primarily on Twitter engagement. Future research can also examine engagement with ISLIs on other social media platforms such as Facebook, Instagram, or TikTok. This study could be conducted using different methods. As mentioned in the section on limitations, it was difficult to find participants that follow ISLIs on Twitter. One suggestion would be to use an experimental approach to gathering data. This could be done by providing examples of information, entertainment, personal identity, social interaction, empowerment, remuneration, and brand love content from various ISLIs and having the participants reflect on the examples given. This would allow people that do not actively follow ISLIs on Twitter to take the survey which would open up the qualifications for participation to more people. This would also allow the researcher to see exactly what content the participant is reflecting on and would add an element of control to the type of content reflected on. In addition, a focus group could be utilized to gather more in-depth data such as participants' reasoning for why they choose to engage with certain content. In a focus group, researchers could examine specifically how motivations influence engagement with zoos, aquariums, or museums separately or how engagement behaviors influence engagement outcomes.

Conclusion

This study was conducted in an effort to bridge the gap between academics and practitioners of public relations. The knowledge that was discovered will be useful for increasing

engagement on Twitter for ISLIs, especially if the findings are disseminated in an easily digestible and widely available format. Zoos, aquariums, and museums are places that encourage informal science learning in individuals who may not have a science background, and ISLI social media accounts can help spread knowledge, awareness, and entertainment to a wide audience. ISLI social media managers should use these findings as a starting point for creating their own posts.

The researcher of the present study examined Twitter engagement through uses and gratifications theory, consumers' online brand related activities, and engagement outcomes. The results suggest that engagement on Twitter enhances the relationship between an ISLI and its audience. ISLIs that post content that is informative, entertaining, and socially interactive will motivate their audience to consume the content. Additionally, informative and entertaining content have a positive influence on the trust, conative loyalty, and purchase intention a follower has towards an ISLI. Strategic communication researchers can use this study as a guide to exploring social media engagement in a variety of industries using uses and gratifications theory. Communication professionals that manage social media for ISLIs should understand these results to effectively develop engaging Twitter content and therefore improve the relationships they have with their publics.

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APPENDIX 1

RECRUITMENT SCRIPTS

Facebook:

Howdy! I'm Jessica Vermaelen and I am currently conducting a research study for my master's thesis about how and why people engage with informal science learning institutions (zoos, aquariums, museums) on Twitter. Your responses are important to me because they will help contribute knowledge about this important communication topic. This study focuses on is what motivates an individual to engage with zoos, aquariums, and science museums on Twitter. This project is facilitated through the Department of Communication & Media at Texas A&M University-Corpus Christi. Participation in this research study will involve completing an online survey. Participation takes 15-20 minutes. Participation in this study is voluntary and you will remain anonymous. If you are 18 years of age or older and are following at least one informal science learning institution on Twitter, click here to participate.

https://tamucc.co1.qualtrics.com/jfe/form/SV_8AEWkheo04C6jc1

For questions, or if you would like additional information to assist you in reaching a decision about participation, please feel free to contact Dr. Michelle Maresh-Fuehrer (michelle.maresh-fuehrer@tamucc.edu; 361-825-2273). Thank you for your assistance with this project.

Twitter:

Howdy! I'm conducting research for my thesis at TAMUCC. If you are over 18 and follow a zoo, aquarium, or museum on Twitter, please consider taking my survey. You will remain anonymous and it should take no more than 10-15 minutes of your time. Thanks!

https://tamucc.co1.qualtrics.com/jfe/form/SV_8AEWkheo04C6jc1

Email recruitment:

Hello [person's name]:

My name is Jessica Vermaelen and I am a master's student in the Department of Communication & Media at Texas A&M University – Corpus Christi. I am conducting a study for my thesis about how and why individuals engage with informal science learning institutions (ISLI), such as zoos, aquariums, and museums on Twitter. I was wondering if you would mind completing a survey. You will remain anonymous (even to me) and this should take no more than 15-20 minutes of your time. **Participation in this study is voluntary.** If you are 18 years of age or older and are currently following an ISLI on Twitter, please click here to participate.

https://tamucc.co1.qualtrics.com/jfe/form/SV_8AEWkheo04C6jc1

For more information about our ongoing research efforts, you may contact the principal investigator, Dr. Michelle Maresh-Fuehrer, 361-825-2273, michelle.maresh-fuehrer@tamucc.edu or the researchers, Jessica Vermaelen, jvermaelen@islander.tamucc.edu, or Dr. Michael Sollitto, 361-825-2443 with any questions you may have.

Thank you and have a great day!

Jessica Vermaelen

APPENDIX 2

CONSENT FORM

CONSENT FORM

[Social Media Engagement]

Introduction

The purpose of this form is to provide you information that may affect your decision as to whether or not to participate in this study. If you decide to participate in this study, this form will also be used to record your consent.

You have been asked to participate in a project studying your intention to engage with informal science learning institutions on Twitter. You were selected to be a possible participant because you are age 18 or older.

What will I be asked to do?

If you agree to participate in this study, you will be asked to respond to survey items about how you engage with informal science learning institutions on Twitter. An informal science learning institution could be a zoo, aquarium, or science museum. Your participation in the study will take place online and take approximately 15-20 minutes of your time.

What are the risks involved in this study?

There are no risks associated with this study.

What are the possible benefits of this study?

You will receive no direct benefit from participating in this study; however, there is the possible benefit that you will be involved in a study that can contribute greater knowledge to social media engagement.

Do I have to participate?

No. Your participation is voluntary. You may decide not to participate or to withdraw at any time without your current or future relations with Texas A&M University-Corpus Christi being affected. There will be no points associated with completing this open-ended survey.

What are the alternatives to being in this study?

Instead of being in this study, you may choose not to be in the study.

Who will know about my participation in this study?

This study is anonymous. There is no identifying information being collected so there is little to no risk of being identified. All research records will be kept securely. Research records will be seen only by authorized research team members. No identifiers linking you to this study will be

included in any report that might be published or presented.

Whom do I contact with questions about the research?

If you have questions regarding this study, you may contact the principal investigator, Dr. Michelle Maresh-Fuehrer, 361-825-2273, michelle.maresh-fuehrer@tamucc.edu or the researchers, Jessica Vermaelen, jvermaelen@islander.tamucc.edu, or Dr. Michael Sollitto, 361-825-2443, michael.sollitto@tamucc.edu.

Whom do I contact about my rights as a research participant?

You may also call Texas A&M University-Corpus Christi Institutional Review Board (IRB) with questions or complaints about this study at irb@tamucc.edu or 361-825-2497. The IRB is a committee of faculty members, statisticians, researchers, community advocates, and others that ensures that a research study is ethical and that the rights of study participants are protected.

For this survey you will reflect on one informal science learning institution (ISLI) that you follow on Twitter. An ISLI can be a zoo, aquarium, or science museum. Please keep this ISLI in mind as you answer all following questions.

APPENDIX 3

SURVEY

Q1 What ISLI are you reflecting on?

Q2 What type of ISLI are you reflecting on?

- Zoo
- Aquarium
- Science Museum

Q3 Approximately how many ISLIs are you following on Twitter?

Q4 Age:

Q5 Sex:

- Male
- Female
- Other
- Prefer not to say

Q6 Ethnic Background

- Caucasian/White
- African American/Black
- Hispanic/Latino
- Native American
- Asian American/Asian
- Other

Q7 Please respond to the following statements regarding information seeking on Twitter

	Strongly Disagree	Disagree	Somewhat disagree	Neither agree nor disagree	Somewhat agree	Agree	Strongly Agree
The scientific information this ISLI posts is helpful	0	0	0	0	0	0	0
I want to know what other people think about the ISLI	0	0	0	0	0	0	0
I can get information about hours, exhibits, prices, and events	0	0	0	0	0	0	0
Following this account helps me form an opinion about the ISLI	0	0	0	0	0	0	0

Q8 Please respond to the following statements regarding entertainment on Twitter

	Strongly Disagree	Disagree	Somewhat disagree	Neither agree nor disagree	Somewhat agree	Agree	Strongly Agree
I like following this account because it is entertaining	0	0	0	0	0	0	0
This account provides an outlet for me to escape my daily routine	0	0	0	0	0	0	0
Following this account arouses my emotions and feelings	0	0	0	0	0	0	0
Following this account relaxes me	0	0	0	0	0	0	0

Q9 Please respond to the following statements regarding personal identity on Twitter

	Strongly Disagree	Disagree	Somewhat disagree	Neither agree nor disagree	Somewhat agree	Agree	Strongly Agree
I follow this account to express what kind of person I am	0	0	0	0	0	0	0
Following this account gives me self-confidence	0	0	0	0	0	0	0
I want to impress others with what I know about the ISLI	0	0	0	0	0	0	0

Q10 Please respond to the following statements regarding social interaction on Twitter

	Strongly Disagree	Disagree	Somewhat disagree	Neither agree nor disagree	Somewhat agree	Agree	Strongly Agree
I look forward to talking, discussing, and sharing information with others that also like the ISLI	0	0	0	0	0	0	0
Following this account makes me feel more connected to the ISLI	0	0	0	0	0	0	0
Following this account makes me feel less lonely	0	0	0	0	0	0	0
I feel closer to the ISLI	0	0	0	0	0	0	0

Q11 Please respond to the following statements regarding empowerment on Twitter

	Strongly Disagree	Disagree	Somewhat disagree	Neither agree nor disagree	Somewhat agree	Agree	Strongly Agree
I want to influence the ISLI to do or not do something	0	0	0	0	0	0	0
I want to influence other people	0	0	0	0	0	0	0
I feel good about myself when other followers like or retweet my ideas and comments	0	0	0	0	0	0	0
Receiving affirmation about my comments makes me want to engage with the ISLI more often	0	0	0	0	0	0	0

Q12 Please respond to the following statements regarding remuneration on Twitter

	Strongly Disagree	Disagree	Somewhat disagree	Neither agree nor disagree	Somewhat agree	Agree	Strongly Agree
When I want to visit the ISLI, I use the ISLI's Twitter to search for better prices or coupons	0	0	0	0	0	0	0
I am motivated to engage with the ISLI because I can earn money, prizes, or discounts	0	0	0	0	0	0	0
I am able to obtain information I want without any delay	0	0	0	0	0	0	0
I want to get a better service	0	0	0	0	0	0	0

Q13 Please respond to the following statements regarding brand love on Twitter

	Strongly Disagree	Disagree	Somewhat disagree	Neither agree nor disagree	Somewhat agree	Agree	Strongly Agree
I am motivated to engage with the ISLI because I am passionate about the ISLI	0	0	0	0	0	0	0
I associate the ISLI with some important events of my life	0	0	0	0	0	0	0
I engage with the ISLI because I care about the ISLI	0	0	0	0	0	0	0
I identify myself with the ISLI	0	0	0	0	0	0	0

Q14 Please respond to the following statements regarding consuming content on Twitter

	Strongly Disagree	Disagree	Somewhat disagree	Neither agree nor disagree	Somewhat agree	Agree	Strongly Agree
I read the content posted by the ISLI on Twitter	0	0	0	0	0	0	0
I view pictures or photos posted by the ISLI on Twitter	0	0	0	0	0	0	0
I watch videos posted by the ISLI on Twitter	0	0	0	0	0	0	0
I read posts, threads, and replies of other people about the ISLI on Twitter	0	0	0	0	0	0	0

Q15 Please respond to the following statements regarding contributing content on Twitter

	Strongly Disagree	Disagree	Somewhat disagree	Neither agree nor disagree	Somewhat agree	Agree	Strongly Agree
I 'like' content posted by the ISLI on Twitter	0	0	0	0	0	0	0
I retweet content posted by the ISLI on Twitter	0	0	0	0	0	0	0
I reply to content posted by the ISLI on Twitter	0	0	0	0	0	0	0
I reply to posts, threads, and replies of others about the ISLI on Twitter	0	0	0	0	0	0	0

Q16 Please respond to the following statements regarding creating content on Twitter

	Strongly Disagree	Disagree	Somewhat disagree	Neither agree nor disagree	Somewhat agree	Agree	Strongly Agree
I create posts related to the ISLI on Twitter	0	0	0	0	0	0	0
I post pictures, videos, or personal images related to the ISLI on Twitter	0	0	0	0	0	0	0
I add hashtags or tag the ISLI on my posts related to the ISLI on Twitter	0	0	0	0	0	0	0
I write reviews, threads, and personal opinions related to the ISLI on Twitter	0	0	0	0	0	0	0

Q17 Please respond to the following statements regarding brand trust on Twitter

	Strongly Disagree	Disagree	Somewhat disagree	Neither agree nor disagree	Somewhat agree	Agree	Strongly Agree
This ISLI meets my expectations	0	0	0	0	0	0	0
I feel confident in this ISLI	0	0	0	0	0	0	0
This ISLI never disappoints me	0	0	0	0	0	0	0
This ISLI guarantees satisfaction	0	0	0	0	0	0	0

Q18 Please respond to the following statements regarding brand loyalty on Twitter

	Strongly Disagree	Disagree	Somewhat disagree	Neither agree nor disagree	Somewhat agree	Agree	Strongly Agree
This ISLI means a lot to me	0	0	0	0	0	0	0
I am very attached to this ISLI	0	0	0	0	0	0	0
It would be difficult to change my beliefs about this ISLI	0	0	0	0	0	0	0
Even if close friends recommended another ISLI, I would not change my preference	0	0	0	0	0	0	0

Q19 Please respond to the following statements regarding brand loyalty on Twitter

	Strongly Disagree	Disagree	Somewhat disagree	Neither agree nor disagree	Somewhat agree	Agree	Strongly Agree
I would recommend this ISLI to people who seek my advice	0	0	0	0	0	0	0
I would tell other people positive things about this ISLI	0	0	0	0	0	0	0
I would recommend this ISLI to my friends	0	0	0	0	0	0	0
I would engage with this ISLI again	0	0	0	0	0	0	0

Q20 Please respond to the following statements regarding purchase intention on Twitter

	Strongly Disagree	Disagree	Somewhat disagree	Neither agree nor disagree	Somewhat agree	Agree	Strongly Agree
I would be willing to visit this ISLI	0	0	0	0	0	0	0
I would tell other people positive things about this ISLI	0	0	0	0	0	0	0