SOCIAL MEDIA ADVERTISING: MARKETING E-CIGARETTES ON INSTAGRAM TO ADOLESCENTS & EMERGING ADULTS IN THE UNITED STATES

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ABSTRACT

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While the proliferation of social media brought great opportunities for marketers and advertisers, these platforms have become focal for public health risks especially with younger populations. Underage e-cigarette use has become a public health epidemic in the United States, especially among adolescents. Per the Food and Drug Administration (FDA, 2018b), the e-cigarette industry is aggressively and successfully promoting e-cigarettes among underage populations through product design, variety of flavors, social media marketing and advertising campaigns (Bronstad, 2020, February 19; Betz, 2020, February 25). With limited research examining the different strategies implemented to attract and target adolescents and young adults, the current study investigated how underage youth and young adults can access and get targeted by e-cigarette brands and retailers on the popular social media platform, Instagram. To do so, the study used fictitious Instagram user profiles of varying ages (13 vs. 19 vs. 25 years old) and two forms on user engagement (post vs. reach) over a three-week intervention period. The goal of the study is to document whether or not users below the legal purchase age (i.e., 13) are able to access e-cigarette content on Instagram, and more importantly, what types of messages and sponsored content will they receive and be targeted with over the intervention period. Findings showed e-cigarette retailers and brands are actively targeting adolescents and emerging adults through Instagram. By providing promotional and marketing content in Instagram through open accessibility, direct privet communication messages, and engagement with users content regardless of promotional and age legal restrictions.

Keywords: E-cigarette, youth, underage, Instagram, access, engagement, post, reach.

This thesis is dedicated to my mother, Wadha Awad, and my father, Naka Nakayn. Without their love and endless support, I would never have been able to be who I am today. I love my mother and I love you my father so much. This thesis is also dedicated to my family, my love Meznah and my great daughters Joud, Jenna, & Ayah who were always there for me throughout my education journey.

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CHAPTER 1

INTRODUCTION

Adolescents' consumption of e-cigarette, also known as vaping, has grown rapidly and is thought to contribute to the combustible tobacco and marijuana use at a later age (Wills, Knight, Williams, Pagano & Sargent, 2014). In 2018, findings from National Youth Tobacco Survey (NYTS) showed that 3.6 million middle and high school students were regular e-cigarette users despite minimum legal age (MLA) required to access tobacco-related products, including e-cigarettes (FDA, 2018a).

In a statement released on September 12, 2018, Scott Gottlied, Commissioner of the Food and Drug Administration (FDA), declared a state of public health epidemic related to teen e-cigarette use (FDA, 2018b). Much of the public health debate revolves around whether e-cigarette devices are capable of providing traditional cigarette smokers with a safer alternative or serve as the new frontier for consumption of new tobacco products, thus marking e-cigarette a novel gateway to nicotine and tobacco addiction (Open Secretes, 2018).

National and international health campaigns, changes in regulations, and enforcing new forms of curbing the appeal of tobacco and nicotine products (e.g., enforcing graphic health warning and cigarette plain packaging) largely contributed to reduction of tobacco consumption and nicotine addiction worldwide especially among adolescents and nonsmokers (Hiilamo, Crosbie & Glantz, 2014). The reduction of combustible tobacco consumption presented a threat to the tobacco industry profitability and market share. Therefore, e-cigarette manufacturing has been presenting an innovative way to reshape tobacco consumption experience and rebrand smoking behavior appearance to broader consumer segments including underage populations. The adolescent vaping epidemic (FDA, 2018b) and violation of MLA to access vaping products in recent years pushed the FDA to monitor e-cigarette distribution channels and marketing and advertising practices in violation of federal regulations, with special attention given to social media activities targeting underage populations (Food and

Drug Administration, 2018b). Public health researchers and advocacy groups documented the use of social media, like Instagram, Facebook, and Twitter, to promote e-cigarettes, through sponsored ads, celebrity product endorsements, brand communities, and sales promotion (e.g. Cenicola, 2019; Huang et al., 2018; LaVito 2018; Richardson, Ganz, & Vallone, 2015). While the FDA insists that underage youth are being targeted with a multitude of promotional strategies, the e-cigarette industry continue to disregard such claims and deny direct targeting of members of this population. Additionally, per industry reports (e.g. Cenicola, 2019; Huang et al., 2018; LaVito 2018; Richardson, Ganz, & Vallone, 2015), e-cigarette marketers are resorting to indirect tactics of targeting young consumers, including influencer marketing and investment in brand-related communities.

The current study aims to investigate the level of access to information, direct communication, and engagement with e-cigarette content by adolescents and emerging adults on Instagram. This aim will be achieved by gathering and analyzing points of interaction with e-cigarette related accounts on Instagram, through employing an exploratory field (quasi) experimental design of fictitious individual accounts of different age groups (13 vs. 19 vs. 25) and user activity type of (post vs. reach). Data received from e-cigarette related profiles and interaction with individual users' content has formed the basis for understanding the level of compliance with FDA regulations and what content underage youth and emerging adults receive about e-cigarettes on Instagram.

This dissertation contributes to public health literature and public health policy enforcement agencies through assessing the current level of compliance with MLA requirements to access e-cigarette content on Instagram. Though unintentional, this work aids advertising and marketing professionals by documenting and analyzing different strategies used to target young people. However, the dominant focus of this dissertation is to uncover the e-cigarette marketing and advertising practices and asses their compliance with federal regulations.

The dissertation is divided into nine chapters. In addition to this first introductory chapter, the second chapter provides an overview of social media advertising: the case of

Instagram, where Instagram advertising method and capacities considered. The chapter also aims to clarify the Instagram funnel model of advertising that include awareness, consideration, and conversion. The third chapter sheds the light on e-cigarettes industry practices, especially in relation to targeting young users via digital and social media. The chapter also provides an overview of current digital advertising regulations related to marketing of tobacco and e-cigarettes. The fourth chapter highlights e-cigarettes use among young population and the related public health concerns. The fifth chapter provides broad conceptual definitions and introduces the study's research questions. Chapter sixth describes the method for conducting an exploratory quasi experiment in terms of experimental design and data collection processes. Chapter seven provides the data analysis process. Chapter eight presents the research findings. Finally chapter nine emphasizes the research limitation and future directions.

CHAPTER 2

SOCIAL MEDIA ADVERTISING:THE CASE OF INSTAGRAM

E-cigarette advertising and marketing strategies by tobacco companies on social medial deserve a closer look by public health researchers, digital advertising scholars, and policy makers alike. Social media in general and Instagram in particular are widely used among young people. According to the Pew Research Center Internet % Technology report, young adults aged 18 to 24 in the United States are heavy users of Instagram (Smith & Anderson, March 1, 2018). Among Instagram users, 38% reported using Instagram several times a day, 22% about once a day, and 39% less often. According to the survey, 60% of users were using Instagram on a daily basis (Smith & Anderson, March 1, 2018).

The proliferation of social media and their increasing use as marketing and advertising strategies and tools have provided e-cigarette companies a great advertising opportunity to market this new product amidst vague and flexible regulatory boundaries. With the wide use of the Internet and the affordability of technology among young people, commercial companies are moving toward branded websites, social media branded accounts, social media advertising, and brand placement in video games, to name a few, instead of investing in traditional marketing and advertising channels (Calvert, 2008; Schor, 2014; Moore, 2004). A survey by Zhu and colleagues (2014) showed that as of January 2014, there were 466 e-cigarette brands with an average of 10.5 new brands every month. The e-cigarette market is rapidly growing and expanding the nicotine dependence market. In a meta-analysis of e-cigarette marketing and communication, Collins, Glasser, Abudayyeh, Pearson, and Villanti (2018) found an emerging reliance among e-cigarette manufacturers and marketers on online marketing channels. They also found that leading e-cigarette brands framed their products in a positive light, as an alternative for combustible cigarettes, while highlighting such products as lifestyle indicators and normative behaviors among adolescents and young adults.

Instagram has been recognized as an important tool for brand integration and interaction

with consumers" social life and experiences. Instagram has gained popularity among users and businesses since its launch in 2010. As of 2018, Instagram is attracting more than 800 million active users every month worldwide, 70&% of whom are adults, while 20% of them are located in the United States (HubSpot, 2018; Instagram, 2018). Additionally, there are 25 million business profiles on Instagram (HubSpot, 2018; Instagram, 2018). The user baseline for Instagram is growing, as of March, 2020, more than one billion accounts are active in Instagram monthly, more than 50% of these accounts are presenting active daily users, and more than 500 million are Instagram stories daily active users (Instagram Business, n.d.; Aslam, 2020). And Instagram users generated more than 50 billion photos to date, more than 100 million photos and videos uploaded per day, and more than 4.2 billion likes per day. And 90% of Instagram users are following Instagram business accounts (Instagram Business, n.d.; Aslam, 2020). Numbers are showing Instagram's large capacity as a consumer base social media platform and the promising potential benefits for business.

Researchers discussed Instagram's capacity as a branding and mobile image machine. Carah and Shaul (2016) documented how different commercial brands used different tools on Instagram, like hashtags, to aid advertising campaigns and create a relatable brand image experience online. The authors argued that by capitalizing on relatable and relevant hashtags accompanying brand-related images on Instagram, marketers are attempting to facilitate engagement through likes, comments, and mentions, as well as motivating consumers to generate and share similar experiences with brand content to their own Instagram networks (Carah & Shaul, 2016). The uniqueness of Instagram as a visual-based social media platform coupled with the capacity for threaded relevance through hashtags and content strategy make for an interesting case when it comes to understanding the mechanics of advertising on Instagram, which is discussed next.

Aside from organic use of Instagram by marketers and advertisers, Instagram offers companies and organizations an opportunity to promote a post or a story posted by the company/organization account or by creating an ad in Facebook Ads Manager (Instagram, 2018).

An Instagram post refers to any post an individual user account creates and posts comprising an image or a video with an accompanying short text as a description. Usually, the text description includes reference to the post's topic, hashtag, username, location, Emoji, and/or time. On the other hand, an Instagram story is a slideshow feature that allow users to capture and post more than one image and/or video with an overarching description and image/video specific text description. In addition to promoting a story, a brand could create a carousel ad, whereby multiple images or videos are grouped within the same post (Instagram, 2018).

As a free image sharing social media mobile application, Instagram revenue model is based on paid advertising (Business Instagram, 2018). Therefore, Instagram encourages users to create accounts and facilitate connecting and matching users with similar interest and proximity. Instagram provides diverse capacities and services to individuals and business accounts users.

Using Instagram business and individual accounts, companies and organizations can share different forms of experiences through photo, video, carousel, stories, and collection of images in one post. In particular, as of December, 2018 Instagram personal and business users are able to (1) post content that appears mainly to followers, (2) tag Instagram accounts using "@" followed by the account name either in the commenting section or on the post itself before publishing it, (3) comment on a post with text, (4) send a direct message (DM) to other Instagram accounts with text or image or a video, (5) upload a live or stored story with image or video content that appears mainly to followers, and (6) serve the explore page for content recommended by Instagram algorithm engine (Business Instagram, 2018; Instagram Business, n.d.; Aslam, S, February 10, 2020). Instagram introduced the feed ranking algorithm engine in July 2016 to increase the time users spend on the app (Wagner, 2018 Jun; Constine, 2018). Prior to that change, Instagram ranked the feed in a reverse chronological order, whereby the algorithm now bypasses the chronological order and can provide content based on user advertising profiles. Also, beyond the different content posting capacities,

Instagram allows business profiles to disseminate advertisements and marketing campaigns to meet the organization objectives (Business Instagram, 2018; Instagram Business, n.d.; Aslam, S, February 10, 2020).

There are more than 25 million business profiles on Instagram and more than 200 million visits to business profiles daily as of October 2018 globally (Instagram Business, 2018). For business accounts, Instagram allows users to boost content traffic through paid sponsored posts to promote awareness and consideration using an organic fashion, i.e., focusing on advertising objectives without the capacity for a specific action. Additionally, Instagram offers business profile users paid ads to drive a precise consumer profile targeting with marketing objectives including conversion actions like sales, mobile app engagement, and app downloading (Business Instagram, 2018; Instagram Business, n.d.; Aslam, S, February 10, 2020).

Business paid posts on Instagram can be done directly by the business profile administrator or through the Instagram Ads Manger setup tool provided by Instagram or though hiring an outside agency like Instagram Partners. Through these tools, companies and organizations could identify and reach Instagram users based on location, demographics, interests, behaviors, audience's phone or email, or targeting audience based on a companion of these elements (Business Instagram, 2018; Instagram Business, n.d.; Aslam, S, February 10, 2020).

Instagram successfully provides businesses the ability to extend their advertising and marketing objectives using awareness, consideration, and conversion funnel model (Business Instagram, 2018). The platform helps business profiles to acquire brand awareness and opinions based on targeted reach and frequency. Therefore, business profiles are able to develop a consideration mode among the targeted consumers through traffic, engagement, video viewing, and lead generated capacities and action. Instagram allows business users to meet their marketing objectives through web conversions, dynamic ads, and mobile app installation capacities. In 2019, Instagram generated more than $20 billion in ads revenue surpassing other known social media advertising-based platforms like Facebook (Business

Instagram, 2018, Frier, S., & Grant, N.; 2020, February 5).

In addition to direct-to-consumer advertising via Instagram, brands are leveraging celebrities and micro celebrities (influencers) to facilitate brand interaction, promotion, and community building. Instagram matches and connects users with content based on the individual user's profile, pattern of past content consumption, and geolocation to facilitate communities' creation and culture building around common themes by using algorithmic techniques, to enforce a descriptive norm (Marwick, 2015; Instagram Business, n.d.; Carah & Shaul, 2016).

Tobacco and e-cigarette marketers and advertisers have been leveraging the affordances of social media platforms like Instagram to promote content through a variety of tactics, including organic presence, promoted posts, and influencer marketing. For example, Huang et al. (2018) noted that, as of 15 February 2018, Juul's official account on Instagram included 129 posts with 32,300 followers. Additionally, their analysis showed that six additional Juul accounts were created by online retailers promoting the brand. Huang et al. (2018) showed that of the 129 posts on the official Juul account, 117 fit into one of the following four content categories: 'lifestyle' 'appeal', 'product images', 'customer feedback/testimonies' and 'flavor images.' These posts generated high level of brand-related engagement and interactions. For instance, according Huang et al. (2018), content classified with 'lifestyle appeal' generated 42,687 likes, with all the posts attracting more than 7,000 comments (Huang et al., 2018). It is worth mentioning that as of November 2018, the Juul official page on Instagram removed all content and refrained from posting (Al-Heet, 2018). However, the official account still boasts close to 92 thousand followers and is following 466 Instagram profiles. While Juul has changed its social media strategy in terms of organic posting about e-cigarettes on Instagram and other social media (e.g., Twitter), the company still maintains a presence on these social media platforms, and therefore has access to user data and information.

The trend presented by the Juul example (Huang et al., 2018) is a reflection of ongoing practices among tobacco and e-cigarette manufacturers and marketers. Richardson and

others (2015) found that online banner and video tobacco ads content were mainly used to promote e-cigarette and cigars rather than combustible cigarettes. They also found that these ads appeared in websites that contain about one third of underage audience (i.e. less than 18 years). As Instagram provides advertising tools and strategies for businesses to reach and communicate with consumers, it is important to understand these strategies with a regulatory lens. The next chapter focuses on marketing and advertising regulation related to e-cigarette products.

CHAPTER 3

E-CIGARETTE USE AND ONLINE ADVERTISING REGULATIONS

The tobacco market is evolving with new products and new consumers. According to the Surgeon General report, tobacco sales in 2016 in the United States amalgamated &%240.5 billion, a $3.8 billion decrease in sales from 2015 (Federal Trade Commission, 2018). This decrease in sales was met with a five percent increase in tobacco advertising spending, which reached $8.72 billion in 2016 (Federal Trade Commission, 2018). The decrease in revenue and increase in ad spending presented tobacco manufacturers with challenges that were met with rebranding the industry by introducing new products, acquiring new consumers, or a combination of both strategies.

Adolescents and emerging adults' use of e-cigarettes has been rising over the past decade. Per the Surgeon General report, the number of 13- to 17-year-olds who consume e-cigarettes has more than tripled since 2011, while the prevalence of e-cigarette uses among those aged 18 to 24 has more than doubled since then (Federal Trade Commission, 2018). More precisely, in 2015, about 16% of high school students and 5.3% of middle school students reported using e-cigarettes during the previous 30 days, and 5.3% of emerging adults used e-cigarette during the past 30 days in 2013 (Federal Trade Commission, 2018). According to National Youth Tobacco Survey in 2015, 27.1% of adolescents aged from 13 to 18 reported they have previously tried e-cigarettes (Centers for Disease Control and Prevention, 2018b). The common reasons for using e-cigarette among young Americans include perceived low health risk, curiosity, and taste (Centers for Disease Control and Prevention, 2018b). Recent data from Germany for the period between 2007 and 2016 showed a decline in using traditional cigarettes (i.e. smoking cigarettes) among young people and rise of other tobacco products including e-smoking or vaping (Orth & Merkel, 2018).

Since its introduction to the U.S. market in the mid-2000s, the e-cigarette market has grown in term of product offerings by multiple manufacturers (Regan, Promoff, Dube, &

Arrazola, 2013; Federal Trade Commission, 2018). This growth in product offerings has also been reflected in diversification of distribution channels and promotional strategies used by e-cigarette manufacturers to target young people including traditional (e.g., magazines, point-of-sale promotions) and digital (e.g., social media and Internet advertising and promotion) channels. E-cigarette marketers' resort to using a myriad of appeals to promote e-cigarettes, such as capitalizing on sex appeal, youthfulness, and inclusion of consumer testimony in marketing efforts. This diverse set of marketing strategies related to distribution, sales, and promotion has led to an increase in sales volume and a drop-in e-cigarette prices (Federal Trade Commission, 2018). The e-cigarette market is dynamic even at its current primitive stage, especially among young people. These factors call for a systematic effort to monitor and evaluate the short- and long-term effects on public health. Given youth and emerging adults' increasing adoption and use of Instagram (Smith & Anderson, March 1, 2018), the current study mainly focuses on the success of these strategies despite regulatory boundaries restricting access to and engagement with e-cigarette content among these populations.

To develop a better understanding of the e-cigarette industry's advertising and promotion activities on social media, it is important to develop a solid understanding of the regulatory layers associated with promoting e-cigarettes online. Therefore, this chapter covers the e-cigarette federal and state regulations within the boundaries of the Instagram policy for tobacco products advertising and promotion.

3.1 Regulating E-Cigarettes Online

E-cigarette regulation is behind and in an early stage of development and implementation in many countries including the United States. Partly, that delay is due to the nature of e-cigarettes, which consist of the e-cigarette delivery device and the e-liquid that contains nicotine and other substances. This creates a level of complexity in terms of regulation, as the jurisdiction is shared between tobacco and medical device regulators (Kim, Kabir, Jahan, 2016). The need to adopt regulations to new emerging addictive substances and devices, like

e-cigarettes, creates another challenge for the public health policy regulatory systems.

Several countries, like Saudi Arabia, Kuwait, Singapore, Brazil, and Uruguay, are prohibiting the use and sales of e-cigarettes. Other counties either legalize using and selling e-cigarettes (e.g., United States), have no e-cigarette regulations (e.g., Japan and Russia), or classify e-cigarette as a medical drug requiring a subscription for legal purchase and use (e.g., Austria, Denmark, and Estonia).

Since 2016, e-cigarette regulations in the United States are under the Food and Drug Administration (FDA) jurisdiction on tobacco products, i.e., the Family Smoking Prevention and Tobacco Control Act (FDA Center for Tobacco Products, 2018). The Family Smoking Prevention and Tobacco Control Act is a comprehensive law that addresses e-cigarette products branding, labeling, advertising warnings, warning label statements, advertising and promotion restrictions, products' feature, point-of-purchase marketing, minimum legal age (MLA) for access to tobacco, and content disclosure (FDA, 2009).

In one of the FDA recent moves against e-cigarette manufacturers, retailers, and marketers is its recent warning letter (13th Floor Elevapors, LLC 5/10/18), which is one of 13 warning letters to tobacco companies. This letter comes as a response to a current misbranding violation from some of e-liquid brands with kid-friendly food products packaging for misleading and false advertising content, e.g., Frank 'N Vape E-liquid and Franken Berry cereal (FDA Center for Tobacco Products, 2018). The letter addressed this violation in accordance with the Family Smoking Prevention and Tobacco Control Act or what is known as section 901(b) of the FD&C Act (21 U.S.C. § 387a(b) (FDA Center for Tobacco Products, 2018): "It is your responsibility to ensure that your tobacco products and all related labeling and/or advertising on this website, on any other websites (including e-commerce, social networking, or search engine websites), and in any other media in which you advertise comply with each applicable provision of the FD&C Act and FDA's implementing regulations' any adulterated and misbranded tobacco products offered for import into the United States are subject to detention and refusal of admission."

Evaluating the advertising practices of e-cigarette retailers on social media could assist policymakers to gauge and develop the required regulation to control tobacco pervasiveness especially among young people.'

State-level regulations of e-cigarettes were not uniform and were based on each state regulation until August of 2016. In August of 2016, all states were mandated to maintain the minimum requirements according to the FDA tobacco regulations. Some states and jurisdictions are stricter than the FDA regulations. While the FDA regulations set MLA at 18 years old, in more than 200 locations and cities, such as Hawaii and California, the MLA prohibits sales of e-cigarettes to individuals younger than 21 years old (Public Health Law Center, 2016). In September 2019, the Trump administration announced a policy that bans the sales of "fruit, mint, and other e-cigarette flavors to keep them away from kids," with exceptions to "[m]enthol- and tobacco-flavored cartridges" (Lupkin, 2020). Lupkin (2020) reported that the Health and Human Services Secretary Alex Azar indicated that this new policy is meant to maintain the use of e-cigarettes as a method for adults to transition away from combustible cigarettes, yet is meant to reduce its potential as an "on-ramp" for nicotine addiction among children and underage youth.

Beyond these legal variations, we know little about the e-cigarette retailers' adherence to federal and states guidelines. This research is an effort to document some of e-cigarettes brands social media advertising and promotion behavior using a quasi (field) experiment.

On Instagram, tobacco content accessibility and age-related restrictions are critical for public health policy makers and tobacco control initiatives. Given that e-cigarette consumers are typically young people who gravitate toward Instagram where 38% of Instagram users are young people with 7% of users between the ages of 13 and 17 and 32% between the ages of 18 and 24 (Statista, January, 2018), the current study's focus on examining accessibility and targeting of these age cohorts is essential to checking adherence of e-cigarette companies to federal laws regulating promotion and marketing of tobacco products. According to Instagram advertising policy "Anyone signed into the Instagram app can view photos or

videos on someone's public profile... Ads must not promote the sale or use of tobacco products and related paraphernalia" (Instagram Help Center, n.d.). While Instagram advertising policy clearly states that any advertising image that promotes an e-cigarette is considered non-compliant, the same policy allows for people with tobacco-related interests to connect as long as no sales take place on the platform. In other words, the platform prohibits content that promotes the sale of e-cigarettes yet stands silent at efforts to raise awareness and change attitudes of consumers about these products. While the Instagram policy mentioned that some restrictions like smoking images and age restrictions apply to direct tobacco ads, the policy clearly left the door open for other ways of interacting with content that promote tobacco and e-cigarettes on its platform. Based on Instagram ads and community policy, Instagram users under MLA are not restricted from accessing e-cigarette retailers' accounts, interacting with e-cigarette related content, and viewing e-cigarette promotional posts. This, on its own, is problematic from a public health perspective.

Part of the challenge lies not only in the ambiguity of what counts as marketing of e-cigarettes and tobacco products, but also in terms of the ambiguity of tracking consumer access to content, the nature of that content, and more importantly, the effects of these marketing strategies. Given Instagram's dynamic algorithm engine that consider user's past experiences and profile (Techcrunch, n.d.), it is plausible for e-cigarette-related content to reach underage users through their feeds. Featuring new products, user testimony, new smoking tricks, illustration of smoking, positive and funny lifestyle while smoking, youthfulness and smoking, direct ads, sponsored and promoted posts, are examples of e-cigarette content that might be disseminated through users' Instagram newsfeed (Techcrunch, n.d.; Business Instagram. 2018). While age-gating in Instagram is limited to direct advertising of e-cigarettes to protect underage population, content that is promoting e-cigarette and targeting adolescents beyond these boundaries exists and flourishes.

To summarize, this chapter provided an overview of the regulatory boundaries surrounding the marketing and promotion of e-cigarettes, with ample focus on digital media. It is

apparent from this chapter that given the flexible, and loosely-enforced regulations, creative tactics are used to appeal to younger consumers. The next chapter is dedicated to understanding the effects – albeit with little evidence – of e-cigarette use on younger consumers.

CHAPTER 4

E-CIGARETTE USE AMONG YOUNG POPULATION

E-cigarette (vaping) is an electronic nicotine delivery system. Vaping has been rapidly growing in recent years among young people and has become a worldwide health epidemic. E-cigarette success in the United States has been partially attributed to the massive advertising for e-cigarettes as replacement for combustible cigarettes with marketing efforts focusing on the lifestyle, trendiness, youthfulness, and safety of its use in comparison to cigarettes (Kong, Morean, Cavallo, Camenga, & Krishnan-Sarin, 2014). E-cigarettes, especially among adolescent population, are perceived to be less harmful compared to combustible cigarettes (Leventhal et al., 2015, Primack, Soneji, Stoolmiller, Fine & Sargent, 2015).'

Since vaping swept worldwide, nicotine dependence, tobacco consumption, and substance use have been rapidly increasing. Several longitudinal studies showed that nonsmoking adolescents who experimented with e-cigarettes were more likely to try combustible cigarettes and marijuana at a later age (Lozano, Barrientos-Gutierrez, Arillon-Santillan, Morello, Mejia, Sargent, & Thrasher, 2017; Leventhal et al., 2015; Primack et al., 2015; Unger, Soto & Leventhal, 2016; Soneiji et al., 2017; Wills & others, 2014; Wills, Sargent, Gibbons, Pagano & Schweitzer, 2016). In a study done with a Mexican sample, Lozano et al. (2017) found that more than 8% of 8th graders reported using e-cigarettes only, 6.6% reported only smoking cigarettes, and 3.3% reported using both e-cigarette and traditional cigarette at the same time.

E-cigarettes might be useful for adults who smoke combustible cigarettes as a method for quitting and controlling nicotine intake and addiction, but e-cigarettes are not safe and contribute to developing addictive smoking behavior among nonsmokers especially young people (Centers for Disease Control and Prevention, 2018a; Myers, 2020). The varied health effects and risks of e-cigarettes as a function of generational differences can be explained, at least partly, by looking at generational differences from a developmental perspective. The

following section explicates the difference between adolescence and emerging adulthood as a key factor in the current study.

4.1 Adolescence and Emerging Adulthood

Young people have been the focus of research in fields like psychology, communication, and public health. To better understand the health and policy ramifications of e-cigarette advertising via social media on youth and emerging adults, it is imperative to decipher the attributes of these target populations that facilitate access to and success of digital marketing strategies to promote use of e-cigarettes. This is important for two main reasons. First, given the legal age limitation for advertising and selling e-cigarette for adolescents, it is important to examine the study's central research question within boundaries of age restrictions (U.S. e-cigarette regulation, 2018). Second, psychological differences among youth and emerging adults in relation processing and evaluating risk behavior and advertising content (e.g., Arnett, 1998; Rindfuss, 1991; Arnett & Tabler, 1994; Arnett, 2000) solidifies the need for careful investigation of different strategies employed to reach and engage with younger population. The remainder of this chapter is organized in lieu of these two critical approaches to segmenting the target population.

4.2 Legal Age Requirement for Adolescents

The minimum legal age (MLA) to access to tobacco is 18 years old for most of the United State, with only four states setting MLA at 19 years old. However, New York City and several other districts and localities set MLA at 21 years old. Based on MLA of access to tobacco, any sales effort or promotional content activities to underage consumers is considered illegal and punishable by law (U.S. Food and Drug Administration, 2018). Also, beside the age restriction of cigarettes or smokeless tobacco products advertising activities including sponsoring events, sponsorship content and items, sample distribution, and any packaging or health claims are restricted without FDA order (U.S. Food and Drug Adminis-

tration, 2018). Despite the fact that e-cigarette use among teens in the U.S. is more prevalent than combustible cigarettes (Wadley & Bronson, 2014), e-cigarettes are not regulated under any federal legislation (Gourdet, Chriqui, & Chaloupka, 2014). All current regulations of e-cigarettes are based on state and/or local jurisdiction regulatory law (Gourdet & others, 2014). Under state-level laws, e-cigarettes regulations are covered under the smoke-free air (12 states) or youth access to tobacco (22 states) laws. Only one state enforces additional taxation on e-cigarette (Gourdet et al., 2014). On the federal level, the FDA recently embarked on regulating e-cigarettes (U.S. Food and Drug Administration, 2018; Gourdet et al., 2014). Even though federal regulations are not coinciding with the tobacco market fast development, the MLA is critical for local regulations and enforcement of these regulations. Based on this, any individual under 18 years old should be protected from e-cigarette sales and marketing. While the minimum MLA set in most states is 18 years old, variations in regulations (19 or 21 years old in some states) bring the question of differences in cognitive development that might correlate with this variability in MLA restrictions. The next section focuses on these developmental differences.

4.3 Developmental Differences between Adolescents and Emerging Adults

From a developmental perspective, youth between the ages of 10 and 18 are referred to as adolescents, while those 19 to 25 years old are referred to as emerging adults (Arnett, 1998). Adolescents represent a heterogeneous age group that is different from emerging adulthood. Few of the great developmental scientists like G. Stanley Hall (1904) and current scholars like Elliott & Feldman (1990) think that adolescence extends until the age of 24. For the purposes of this study, adolescents and emerging adulthood are two distinct, coherent age groups demographically, subjectively, and developmentally.

Demographically, adolescents developed to be emerging adults and each stage is a very distinctive. While a typical adolescent attends secondary education, the majority of emerg-

ing adults either mainly attend college or are employed. This represents a distinctive demographic difference between the two groups. Adolescents are unified across most of the demographic key characteristics. Adolescents mostly live with their parents, are enrolled in a high school level education, and work part-time jobs to cover their leisure time expenses (Arnett & Tabler, 1994). Only less than 10% of adolescents have had a child or are married in the United States (U.S. Bureau of the Census, 2013). The need for secondary education and seeking temporary jobs results in delayed marriage and parenting commitments among adolescents, as they are, traditionally, focused on knowledge and education acquisition. Based on the characteristics of developmental stage of adolescents, risky health behavior like experimenting with smoking and smoking regularly is hard to do and possibly triggers involvement by others within their environment (e.g., parents, family members, and/or teachers) due to dependency on a caregiver and limited income, social expectation of conformity with social norms like not smoking and regulations like MLA.

On the other hand, normatively speaking, emerging adulthood represents a widely diversified demographic group in terms of living situation, education, and marital status. The experimental and exploratory nature of the emerging adulthood period makes it impossible to predict and analyze the demographic characteristics of emerging adulthood based on age criteria (Rindfuss, 1991; Arnett, 2000). Nevertheless, most Americans aged 18 to 25 leave home to live at a university accommodated housing like dormitory, sorority, and fraternity or independently living to pursue their education and career development. About 30% of emerging adults leave home for college housing while about 40% of them leave home for a job opportunity. About 60% of emerging adults are involved in a romantic cohabitation partner (Goldscheider & Goldscheider, 1994; Arnett, 2000, 2006). Given these demographic characteristics, the risk factors, especially related to experimenting with risky behaviors like smoking and vaping, are heightened. This age group strives for independence due to living circumstances, normative perceptions, and peer influence, developmentally, they might still share attributes with adolescents.

The normative development of adolescent and young adults presents a clear difference in the physical and psychological functions of the two groups. Typically, adolescents are expected to follow certain normative development. Puberty, which is initiated between the ages of 12 and 16 years, is considered a milestone in adolescents' physiological and psychological normative development (Eveleth, Eveleth & Tanner, 1976; Arnett, 2000). Also, during adolescence, individuals negotiate identity and role formation based on family fostering experiences and values (Kroger, 2005). Socially, adolescents are expected to be dependent on their parents and enroll in secondary education. In the United States, adolescents typically start dating between the age of 12 and 14 and consider romantic love as a recreational experience. Around the age of 16, adolescents are expected to hold a part time job to cover personal leisure expenses (Arnett, 2000). Due to the high level of family and social identity conformity expectation, it is hard for adolescents to enact risky behavior like smoking.

While emerging adults are not going through huge physiological changes like adolescents, they experience great psychological and social development. In industrial and postindustrial societies, psychologically, emerging adulthood represents a period of exploring different aspects of life and building personal directions independent from family with a very low social normative expectation (Arnett, 2000). Emerging adulthood is a period of identity exploration. The social pressure to start a family and hold a specific career path is very low. Nevertheless, society expects emerging adults to try and experience different areas of studies, different jobs, participate in civic life, and explore long term love relations. Emerging adults are given an opportunity to build personal experiences about career, relationships, and worldviews around them that shape their identity and prepare them for adulthood.

Self-reposted answers from emerging adults showed that the age group from 18-25 years old believe they are not adults and do not have the characteristics of reaching adulthood. These qualities mainly relate to beiung self-sufficient including accepting responsibility for the self, making independent decisions, and financial independence (Arnett, 1998). This aligns with the identity exploration nature of emerging adults. When emerging adults have

qualities of self-sufficiency, they are ready for adulthood including parenthood and career settlement (Arnett, 2000). The exploratory and experimental nature of emerging adults' identity and behavior allows for risky behaviors like smoking to emerge.

4.4 Ad Effects on Adolescents and Emerging Adults

This section contrasts the effects of media and advertising on the two generational groups: adolescents and emerging adults. It is important to note these differences as a means of justifying the age groups subject in the current study.

Given the developmental changes among adolescents, and their strive for independence while still at the auspices of parents and/or guardians, media and advertising influences are critical in shaping their attitudes and behaviors. Adolescents' tendency to feel insecure and strive to fit in affects how they respond to ads and form their consumption behavior. Adolescents receive a great deal of advertising and commercial content that increases their brand consciousness and presents them with an opportunity to fit in and be cool. According to Leonhardt and Ayoubi (1997, pp. 64) "[k]ids this age (8-14) desperately need to belong; they believe that having the right "stuff" is the quickest route to acceptance.... they're very brand conscious." In an experimental study, Achenreiner and John (2003) found that adolescents are able to relate to brand names in conceptual and symbolic evaluation and judgment. In particular, adolescents were able to view brands in ads and sales point and among their peers as a perceptual (quality) cue for familiarity and visibility as well as brand equity and extendibility for other products. From identity development perspective, adolescents are still in the early stages of identity development and self-presentation. Therefore, conformity to peer group or subgroup culture is considered highly important for adolescents (Achenreiner & John, 2003).

Adolescents (10 to 18 years old) process information differently from emerging adults (19 to 25 years old) and early adults (26 to 45 years old) due to their personality development stage (John, 1999; Valkenburg & Cantor, 2001; Buijzen, Reijmersdal, & Owen, 2010). Per

Buijzen et al.'s (2010) processing of commercial media content (PCMC) framework, adolescents are characterized by automatic persuasion processing. PCMC was built at the top of cognitive elaboration as defined by Petty and Cacioppo (1996), where cognitive elaboration presents the level of attention and awareness of the message and the motivation and ability to process the message. Based on Buijzen et al. (2010), automatic persuasion takes a place when information is processed with minimal cognitive elaboration. Under automatic persuasion, an attitude change occurs implicitly and through affect mechanisms, like affect transfer, evaluative conditioning, and emotional associations (Chartrand, 2005; De Houwer, Thomas, & Baeyens, 2001; Dijksterhuis, Smith, Van Baaren, & Wigboldus, 2005). PCMC is used here to explicate the potential impact of exposure to e-cigarette promotional content via social media, as it can potentially lead to automatic processing and persuasion. Smoking exposure can influence attitude and social norms toward smoking which can promote smoking as a behavioral option. Several studies established the link between exposure to tobacco on traditional and social media and subsequent smoking behavior among different age groups (e.g. Depue, Southwell, Betzner, & Walsh, 2015).

In a longitudinal study, Depue et al. (2015) surveyed 200 young adults aged 18 to 24 years about their exposure to tobacco in media (TV, movies, and social media), smoking behavior, and other predictive measures of tobacco prevalence including sensation seeking, age, race, and sex. The researchers demonstrated that between over the period of five months the level of exposure to tobacco on media was the strongest predictor of tobacco use, with greater exposure to tobacco content in media during time 1 positively predicted the level of smoking behavior in time 2. Also, encoded smoking content exposure in social media was more influential in predicting smoking behavior than encoding smoking content exposure in TV and movies among young adults (Depue et al., 2015). Besides that, stronger effects of social media compared to traditional media aligned with the growing use of the Internet and social media especially among younger generations.

In another longitudinal study, Klein, Sterk, and Elifson (2013) conducted face-to-face in-

terviews with 485 adult cigarette smokers to evaluate their early-onset cigarette experiences. The study showed that most of the smokers have their first cigarette smoking between the age of 12 and 16 years old. This shows that tobacco regular users started from an early age experiencing smoking and developed through adulthood to become daily smokers.

Therefore, considering the age group of audiences is critical for our understanding and prediction of how e-cigarette might target different age groups online. Also, how the online content might be classified legally and according to the audience developmental stage capacities.

To summarize, there are two competing approaches to identifying age groups relevant to exposure to and engagement with e-cigarette content on social media. The first approach takes variation in federal and state regulations in relation to MLA restrictions, therefore, there is a need to study individuals representing consumers who are above and below the traditional MLA (18 years old) as well as capturing individuals who, according to the strictest MLA restrictions are legal to purchase and use e-cigarettes (above 21 years old). The other perspective helps us argue for the need to examine individuals representing adolescence and emerging adulthood. The demographic and developmental differences help articulate a potential for varying degrees of influence for mediated messages related to e-smoking. The next chapter provides an overview of specific advertising and marketing strategies, including use of social media, by tobacco and e-cigarette manufacturers and retailers.

CHAPTER 5

TOBACCO INDUSTRY ADVERTISING STRATEGIES

5.1 Historical Overview of Tobacco Advertising

Prior to the emergence of the Internet and social media, tobacco companies have been charged with enforcing pervasive marketing practices targeting social lifestyle, young people, and children. For instances, the tobacco industry established a marketing practice called trend influence marketing (TIM; Berg & associates, 1996). TIM practices focus on creating subtle, genuine, and natural marketing programs and content, where marketing practices are refined on their publicity and dissemination to make sure marketing efforts are invisible to the target audience and public viewers. The premise of the TIM practices lies in producing natural content that integrates flow with the goal of normalizing smoking behavior and diffusing health claims among young populations through young attractive celebrities and other means (Berg & associates, 1996).

Historically, R.J. Reynold Tobacco Company in 1996 implemented "Salem: Operation Green Apple Trend Influence Marketing Program," which aimed to foster Salem's brand awareness during the music festivals using TIM tactics in New York (Berg & associates, 1996). Another older example is Philip Morris's campaign "College Plan" in 1949 that used the slogan "Get 'em young, train 'em right" to target college students (Cahn, 1949). Toba'cco companies consistently resorted to deception through planning a direct advertising and marketing strategies that appeal to young populations by content and media channels. Next, I provide some of the recent documented e-cigarettes information about industry recent claims and marketing patterns and practices.

According to Nielsen Trends, the estimated market size for e-cigarette in U.S. is $5.5 billion$,1.35 billions of which are specific to online distribution channels (Wells Fargo Research, 2018). The share sales performance for e-cigarette brand during the 4-week period ending in Febru-

ary 24, 2018 is led largely by Juul (49.6%) of Juul Labs Inc., followed by Vuse (21.4%) produced by British American Tobacco, Altria Group Inc.'s brands (11.1%; e.g., markten XL, markten XL bold, markten, and green smoke), and blue ecigs by Imperial Tobacco (8.3%; Wells Fargo Research, March, 28, 2018).

5.2 E-cigarette Marketing: The Case of Juul

Tobacco producers, including those manufacturing e-cigarettes, claim they would not target kids and young people through any TIM tactics or viral marketing tactics. According to the British American Tobacco's International Marketing Principles (BAT, n.d.) the company claimed: "We will not engage in any viral marketing in openly accessible on-line or other digital networks where it is impossible to contract the integrity of the message nor the recipients it might reach... the intended audience must be restricted to verified adults' smokers."

Also, in a letter responding to the Tobacco-F'ree-Kids campaign (Campaign for Tobacco-Free-Kids, May 11, 2015), Philip Morris International stated: "[w]e are both against unrestricted use of tobacco branded materials on the Internet, even as part of an advocacy."

To understand the complexities of marketing e-cigarettes via social media, this section reviews the case of Juul, which is deemed the fastest-growing e-cigarette brand since its 2015 launch (Wells Fargo Research, 2018). According to the Jull official website (Juul Website, n.d.), the brand's mission is "improving the lives of the world's one billion adult smokers," where they believe "vaping can have a positive impact when used by smokers and can have a negative impact when used by nonsmokers. Our goal is to maximize the positive and reduce the negative." On November 13, 2018, Juul removed all content from its official Instagram account (see Appendix A). This move from the company came after the recent FDA crackdown on e-cigarette producers marketing practices including Juul. Juul official Instagram account has one announcement about its decision to close the account and their Instagram bio presents the company's mission mentioned above (Juul Instagram account,

n.d.). Even though Juul marketing practices through Instagram are currently on hold, the company's activities on other social media platforms are not. More importantly, Juul still has access to the user profiles of the followers they have amassed over the past few years, thus posing questions about the types of information being transferred to third parties to promote e-cigarettes as well as the brand itself.

I attribute Juul's success in the market mainly to the marketing mix alignments with the younger generation including innovative promotional practices. Juul products have a colorful customized wrap designs, different e-liquid flavored cartridges, a USB flash drive for recharging the vaping device, youth-oriented themes for the campaign like dancing young people while using Juul in parties and selfies throughout their ads, and heavy social media campaigns and promotion via Instagram until late 2018 and currently active on Twitter and through other online platforms (Juul Website, n.d.; Campaign for Tobacco-Free-Kids, n.d.). Juul capitalized on using brand-spe#cific hashtags, like #juul, #juulvapor, and #doit4juul in Juul-sponsored posts and user-generated content (Huang, et al., 2018). The branding effort gave Juul a leading position in the e-cigarette market among smokers and non-smokers including underage consumers (Wells Fargo Research, 2018). An informal search of the #Juul hashtag on Instagram yielded over 430,000 posts. The brand has become extremely popular and pervasive among youth and emerging adults that the act of smoking a Juul e-cigarette is now referred to as "Juuling" (Ducharme, 2018).

According to a survey of school students aged 12 to 17 years old, about 20 percent of the sample reported they have seen Juul used during school time (Truth Initiative, 2018; Hammond, Wackowski, Reid, '& O'connor, 2018). Also, several news stories and reports found that Juul design contributed to its popularity among young people. For example, according to a report by National Public Radio (Teenagers Embrace Juul, 2017): "One reason Juul and vape pens are so popular among teens currently might be that they can be used indoors without attracting unwanted attention or creating a stench... The most brazen of then fire up their e-cigarettes while their teachers' backs are turned."

And in another report by Routh (2017) students are preferring Juul because of its discreet design: "High school and college students are rushing to retailers to buy the product because its discreet design makes it easy to hide from parents and teachers... Some students have bragged on social media of using the Juul in class, even though e-cigarettes are banned indoors at some schools."

Juul Labs Inc. representatives have been recurrently emphasizing the company objectives as providing a better solution for adult tobacco smokers though e-cigarettes while preventing underage use of e-cigarette (AG Sues Juul Over Marketing to Teenagers, 2020). The data showed that students are using e-cigarettes. A lawsuit in Pennsylvania by the Attorney General's Office against Juul Labs Inc. claims that nearly one in four high school students in Pennsylvania reported using e-cigarettes. The case presented how Juul targets teenagers with ads and sales, thus calling for a a freeze on Juul's sales in the state.

Juul recently came under fire by public entities and individual consumers in numerous states including Massachusetts, Pennsylvania, Illinois, California, Minnesota, New York, North Carolina, and California (Bronstad, 2020). In California about two-dozen attorneys are leading over 300 lawsuits against Juul and in Los Angeles a Supreme Court Judge appointed 20 lawyers to lead lawsuit cases against Juul Labs. Public representative in more than 39 states are investigating e-cigarette companies products and practices for possible violations including direct ads targeting youth and misleading information about the vaping devices, deceptive information about e-cigarette health claims (Bronstad, 2020; Betz, 2020).

Juul market value is $35 billion that have successfully created a new market of nicotine dependent users while expanding through the existing segments of combustible cigarettes. Juul is acquiring more combustible cigarette consumer populations. Recently, Juul accepted direct investment of $12.8 billion from Altria for 35% of stock in the company (LaVito, 2018; Cenicola, 2019). This recent move supported Juul brand among Millennial and Gen Z tobacco consumers, since both Altria, through Marlboro the combustible cigarette brand, and Juul are mainly appealing to the same young population through different products.

According to this deal Juul would have access to the top-shelf space of 230,000 retail locations of Altria in the USA market, where Juul pods would be displayed beside Marlboro cigarettes. This move from Juul showed that the company leads the new generation of nicotine addiction products (i.e. e-cigarette). Juul has been blamed by FDA Commissioner Scott Cottlieb, Surgeon General Jerome Adam, and Matt Myers president of Tobacco-Free Kids campaign and public health community for the kids and youth e-cigarettes addiction epidemic (LaVito, 2018; Cenicola, 2019). Juul's success with younger populations results in deepening the nicotine addiction epidemic and beefing up the road for nicotine addiction innovation and production in the market.

The popularity and prevalence of Juul led the FDA to issue an official request in April 2018 to Juul regarding the youth appeal of their products and the company marketing practice that attract kids, young consumers, and nonsmokers (US Food and Drug Administration, 2018). This request did not stop Juul from attracting young people. One of the recent practices by the e-cigarette producers is Juul advertisement's on websites that are mainly viewed by children and teens like cartoonnetwork.com, seventeen.com, and nickjr.com (Betz, 2020, February 25; D'Annunzio, 2020, March 5).

Across different states frequent legal cases are showing that e-cigarette companies are following typical tobacco industry marketing practices (AG Sue, 2020).

The FDA is responding to the quick rising epidemic of kids using e-cigarettes with a gradual ban on flavored e-cigarettes that target kids like fruit, cereals, and cookie flavors (FDA finalizes enforcement policy on unauthorized flavored..., 2020). The policy issued early in January 2020 and within 30 days enforced on flavored cartridge-based e-cigarette sales only and ignoring the disposable flavored e-cigarette. Watchdog agencies are viewing the FDA move as an open "loophole" that allows for disposable e-cigarette sales to flourish, considering past documented behaviors among younger populations and their responsiveness to different product offerings (Aubrey, 2020; Myers, 2020).

While e-cigarette companies have been denying any intention or effort to target young

populations including kids and nonsmokers through advertising content, official documents leak and data analyzed from different social media platforms and websites showed clear evidence of consistent and articulated advertising and promotion campaigns focused on normalizing e-cigarette use among youth and emerging adults (Aubrey, 2020; Cole-Lewis et al., 2015; Myers, 2020).

Cole-Lewis and colleagues (2015) analyzed a sample of tweets between May of 2013 April 2014 to identify public trends related to e-cigarettes content. Their study showed that most of the conversations about e-cigarettes were classified with a positive sentiment (71%) and most of the information and conversations were led by everyday people (65%) and e-cigarettes movement (16%). Content labeled as information and conversations content about e-cigarettes on Twitter include categories such as personal opinions (28%), marketing (21%), first person e-cigarette uses or intent (20%), and policy and government content (20%). Only 5% of the policy and governmental content about e-cigarettes were coming from government or reputable news sources (Cole-Lewis et al., 2015).

A survey of sixth, eighth, and 10th graders from Texas conducted to evaluate the nature and extent of exposure to e-cigarettes-related communications on social media showed stunning findings (Hbert, Case, Kelder, Delk, Perry, & Harrell, 2017). First, about 50% of adolescents in Texas were exposed to tobacco-related content including e-cigarettes via social media platforms. Second, adolescents who were susceptible to tobacco (e.g. adolescents with high sensation seeking) or using any tobacco products including e-cigarettes were more likely to report engaging with tobacco-related content on social media by responding or reblogging. The study concluded that social media presented an important tool in vulnerable adolescence e-cigarettes prevention campaigns (Hbert et al., 2017).

In a recent study, Cortese et al. (2018) used Instagram to explore public health smoking behavior and tobacco related social norms, where they found that selfies of young females while smoking was the most popular image. According to their public health surveillance of analyzing the post content related to text tags of the 18 most common tobacco- and

e-cigarette-related hashtags, images of e-cigarettes comprised 32.1% of the sample, while cigarette images comprised 49% of the sample. Among the selfie images "a cool female smoking" were found to be above 62%. Selfies of smoking images were 61.4% with more than 65% of one female portrait expression. As Cortese et al. (2018) interpreted the findings, "cool" provide a normalization of smoking to counter the restriction of tobacco advertising. Positive images of user experience associated with brand content are shared organically and virally on Instagram. Based on that, Instagram as a social media is used legally as a tool to normalize e-cigarette use among women and young users (Cortese & others, 2018).

E-cigarette content mainly used to create product awareness and exposure among the audience (Emery, Vera, Huang, & Szczypka, 2014). In particular, among individuals who reported exposure to e-cigarettes-related information on TV (66%), radio (19%), banner ads (14%), Internet search engines (11%), and Facebook (9%). When asked about where they searched for e-cigarettes information during the last 30 days, Internet search engines accounted for 80% of responses, social media platforms (33%), and online news (12%). When the channels of sharing e-cigarettes-related information measured, 56% of the information was shared through social media platforms and word-of-mouth accounted for 54%. Also, exposure to e-cigarettes information was highly associated with more education, social media use, and time spent online (Emery et al., 2014).

E-cigarette online retailers current marketing strategies are focused on enhancing the product appeal, presence, loyalty incentives, discounts, and promotions (Mackey, Miner, & Cuomo, 2015). According to their study, half of the 57 e-cigarette online venders were selling e-cigarettes online only and offered a variety of promotional codes (Mackey et al., 2015). Additionally, e-cigarette venders were actively engaged through their websites and social media accounts in variety of advertising and marketing activates including links to product reviews, reward points system, loyalty program, new customers' discount, NSN reference, and positive images and videos for vaping lifestyle. Mackey et al. (2015) also found that, on average, e-cigarettes venders were active in 2.6 SNS platforms at the same

time, with Twitter, Facebook, and Instagram used among 70.2%, 63.2%, and 42.6% of the venders, respectively.

Major e-cigarettes manufacturers systematically target youth in the U.S. An industry study investigating major e-cigarettes manufacturers (Altria, R.J. Reynolds Vapor Company, Njoy, Eon-smoke, Logic, Vmr, Lorillard, Green Smoke, Lead by Sales) between 2012 and 2013 showed direct evidence for sponsoring and sampling events with a youth appearance orientation (Gateway to Addiction, 2014). Six of the manufacturers investigated in the study provided free samples or sponsored a total of 348 events in 2012 and 2013. Seven manufacturers aired their paid TV and radio ads targeting youth viewership under 18 years and the Super Bowl. Also, six of the surveyed manufacturers produced e-cigarettes products that appeal to children with their marketing spending more than doubled between 2012 and 2013 only (Gateway to Addiction, 2014).

Exposing adolescents' audience to e-cigarettes advertisement and marketing content was significantly associated with the probability of rising the e-cigarette among users and non-users alike (Mantey, Cooper, Clendennen, Pasch, & Perry, 2016) and other tobacco products (Auf, Trepka, Selim, Taleb, De La Rosa, & Cano, 2018). Aligned with that is numerous studies showing high school students in the U.S. perceive e-cigarettes as healthy and with minimal health hazards (e.g., Anand, McGinty, O'Brien, Guenthner, Hahn, & Martin, 2015; Roditis & Halpern-Felsher, 2015). This is not surprising given the heavy investment in advertising and social media marketing of e-cigarettes. In other words, evidence supports the claim of e-cigarette marketing success.

Until now our knowledge is very limited about e-cigarette marketing, advertising, and promotional strategies and their compliance with regulations on social media. Among these important questions for public health researchers, policy makers, and advertising literatures, what is the level of companies of e-cigarettes retailers with underage users in social media platforms? How celebrities and promotional contents (non-direct-sale content) reached underage populations on social media applications? What is the level of e-cigarette brand

community and organic promotional content received by underage population on social media? How individual user e-cigarette posts and profile effected content received on social media?

CHAPTER 6

RESEARCH QUESTIONS

The proliferation and adoption of Instagram among youth and emerging adults (Smith & Anderson, 2018) and the vagueness of e-cigarette marketing and advertising on the platform from practical and regulatory perspectives make the focus of this research significant. There is growing evidence that the e-cigarette industry is leveraging various forms of media to target younger populations (Huang, et al., 2018, Truth Initiative, 2018; Hammond, Wackowski, Reid, & O'connor, 2018, Teenagers Embrace Juul, 2017). Based on the MLA on e-cigarettes (U.S. Food and Drug Administration, 2018), the current study aims to investigate the possibility and nature of targ&eting and reach of youth and emerging adults by e-cigarettes retailers and e-cigarette promotional accounts on Instagram.

The current study examines three major outcomes related to the effectiveness of marketing and advertising of e-cigarettes via Instagram – access to information, direct communication, and engagement – as they pertain to varying ages of the fictitious user accounts (13 vs. 19 vs. 25) and their own behavior on Instagram (post vs. reach). User age refers to the declared age of the user as indicated by user profile information provided by the fictitious user. Behavior on Instagram refers to the nature of activities relevant to e-cigarette retailers and brands on Instagram, where an account can post e-cigarette-related content (the user him/herself) or the focus of the behavior is on reaching e-cigarette retailers and brands, following them and interacting with them. In the following, I provide conceptual definitions for each of the study's three outcomes.

6.1 Access to E-Cigarette Content and Accounts

The first outcome this study looks at is the ability of the different accounts to access e-cigarette content on Instagram. Accessing information on social media refers to the ability to reach content shared on Instagram. Therefore, within the context of e-cigarette marketing

and advertising, accessing information on Instagram refers to the ability of an individual user to view content by e-cigarette retailers and brands. From a legal perspective, individuals below MLA for tobacco products should not be able to access e-cigarette related content on Instagram (FCC Internet, 15 U.S.C. 1335 & 15 U.S.C. 4402(f)). Therefore, this study aims to answer the following research questions:

RQ1: What is the difference, if any, among the three fictitious account age groups (13 vs. 19 vs. 25) in accessing e-cigarette content from retailers and brands on Instagram?

RQ2: What is the difference, if any, between fictitious user behaviors (post vs. reach) in accessing e-cigarette content from retailers and brands on Instagram?

RQ3: What is the effect, if any, of the interaction between fictitious users? age (13 vs. 19 vs. 25) and behavior (post vs. reach) on accessing e-cigarette content from retailers and brands on Instagram?

6.2 Direct Communication

Direct communication for social media sites is defined as the effort to understand and be understood on a freely flowing two-way information exchange ("what is a direct message," n.d). Direct communication requires two-way communication, effective feedback, and stress-free flow of information. On social media, a direct message is considered a form of direct communication. I define direct communication in social media as a private form of interaction between the sender and receiver, in this case, the sender is an e-cigarette retailor or brand and the receiver is the fictitious user account. I ask:

RQ4: What is the difference, if any, among the three fictitious account age groups (13 vs. 19 vs. 25) in receiving direct communication from e-cigarette retailers and brands on Instagram?

6.3 Engagement

Scholars conceptually define social engagement as participation in formal and informal social group activities (Prohaska, Anderson & Binstock, 2012; Ellaway & Macintyre, 2007; Utz, Carr, Nesse, Wortman, 2002; Kim, Wang & Oh, 2016). Social engagement according to Zhang, Jiang, and Carroll (2011, p. 570) is defined as "the commitment of a member to stay in the group and interact with other members." Avison, McLeod and Pescosolido (2007) define social engagement as "the extent to which an individual participates in a broad range of social roles and relationships." On social media platforms like Instagram, engagement refers to any actions taken by an individual user in relation to content that has been posted by another user. These actions include, but are not limited to, sharing, liking, and commenting on Instagram posts. In the specific context of the current study, engagement refers to any actions taken by e-cigarette retailors and brands with regard to content posted by the fictitious use accounts. Through this study I raised the following question:

RQ5: What is the difference, if any, among the three fictitious account age groups (13 vs. 19 vs. 25) in engagement with user posts by e-cigarette retailers and brands on Instagram?

CHAPTER 7

METHODS

7.1 Study Design

This study employed a field quasi-experimental design using individual fictitious Instagram accounts. Fictitious Instagram accounts have been created for the experimental conditions. And the accounts have been fed with daily posts, data gathered on a daily base, and analyzed in aggregate form. The study employed a 3 (profile owner age: 13 vs. 19 vs. 25) x 2 (user behavior: post vs. reach) x 3 (Time in weeks) mixed factorial design, with age and user behavior as between-subject and time in weeks as a within-subject factor. Based on that, six fictitious Instagram accounts were created where three ran under post condition and three ran under reach condition, during the second week of the experiment only. The first week (started from Monday) was designed to develop a baseline of the outcome measures, whereas the intervention done during the second week, and the third week presented post-intervention measurement. The manipulation of user behavior type introduced in the second week (named intervention)&, where half of the users (each representing a single age) posted e-cigarettes content only and the other half posted e-cigarette content, accessed e-cigarette related accounts, and interacted with e-cigarette content (see below for more details). Throughout the three weeks (21 days) and for each of the six fictitious #accounts (i.e. both conditions post and reach) a total of 63 social posts (i.e. memes) have been used (three per day). And during the second week (7 days) and for each of the six fictitious accounts (i.e. both conditions post and reach) a total of 21 e-cigarette posts have been used (three per day).

7.2 Independent Variables

Profile Owner Age. The age of the profile owner was manipulated between subjects. During the set-up of the fictitious Instagram profiles, the age of the profile owners was varied to 13, 19, or 25. Age 13 was selected since it is the minimum age required to open an account on Instagram, and at the same time represents a clear indication that a user in this age group in below the MLA for accessing tobacco products including e-cigarettes. According to Apollonio and Glantz, as of 2015, 18 years old is the MLA for 46 states, while 4 states and more than 93 localities had 21 as the MLA (2016). With that in mind, the second profile was set at 19 years old, as an in-between MLA age group, and 25 was selected as a clear age that exceeds the MLA requirements. Also, based on a recent date from the National Health Interview Survey of e-cigarette user among U.S. adults the sociodemographic characteristics analysis indicated that men (17.8%), non-Hispanic white (16.9%), and age group of 18-24 (25.8%) were the highest e-cigarette users (Villarroel, Cha, & Vahratian, 2020). Therefore, I selected white male for the gender and race of the profile owners.

All fictitious users were white males. The only differences were the name, image, and age of the user. Usernames were selected based on the top popular male names in the 2000s from Social Security Administration list (Office of Social Security Administration, n.d.) (see Appendix C). A pretest of the profile images from age and race comparability with the fictitious account age groups have been performed and showed acceptable level of comparability and face value representation. A pretest of the profile images of 36 white male with 12 images from each age group (13, 19, and 25 years old) have been performed and tested by a panel of five social and advertising experts for the comparability and face value representation of the race and age group. Based on the evaluation two images from each age groups (13, 19, and 25 years old) were selected that were evaluated 100% as a white race and 100% as the age group that they represent. After that, six individual Instagram accounts were created, two for the age group 13 years old, two for the age group 19 years old, and two for the age group 25 years old.

The bio section of the profile included the age, name, and location (USA) of the fictitious user (see Appendix D). All Instagram accounts were set up using uniform criteria across conditions adhering to privacy and security of the account itself and the types of activities that can be performed with the account (see Appendix E).

Account Settings. First, the privacy and security of each account was set with the following parameters:

1. The account was set to "public," thus allowing other Instagram users to view the account photos and videos without needing to be a follower (friend) of the account.

2. The account status was set to "active," thus allowing other Instagram accounts and followers to see the last active time the user was on Instagram and allowed the user to see the activity status of other users.

3. Story sharing was activated, where other users were able to share the accounts stories as a message to the fictitious user account.

4. Comments were open Comments, where other users could comment on the fictitious account posts.

5. Photos and videos were set to add automatically, thus allowing other users to tag the account user in photos and videos.

Content Posting Settings. In addition to general account settings, the following parameters were followed when posting original content and comments on other users' posts.

1. All comments were set to open comments setting.

2. No location was added in the posts/comments.

3. No other social media platforms were activated or linked in any of the posts/comments.

4. No other user accounts were tagged in any posts/comments.

5. Hashtags were limited to daily social post and posting condition as described below.

The fictitious accounts refrained from responding to any communication attempt by any other Instagram account. For example, if an account interacted with an e-retailer and they responded, then the fictitious account did not reciprocate responsiveness.

User Intervention Behavior Type. The six accounts were split into two groups (post vs. reach) based on the nature of what the activities the fictitious performed on Instagram.

In the **post** condition, users posted social and e-cigarette content without interacting with any e-cigarette related content on Instagram and also without any attempt to engage in communication with any of the e-cigarette retailers. All actions were limited to posting social (memes) and e-cigarette posts. Therefore, under the posting condition individual Instagram accounts users posted (on the account main page) images with the appropriate hashtags and the same images, and by default, these posts were automatically uploaded to the account story. In total, there were 21 images (3 images per day x 7 days) posted under three Instagram profiles of 13, 19, and 25 years old for each week. Social posts (i.e. memes) comprised of user generated images that have been gathered from Instagram public images that met the following exclusion criteria: branded images, exclusive images with copyrights, and e-cigarette health warning images (for more about the post condition instructions see Appendix F). While in the second week additional 21 images of e-cigarettes were posted (3 images per day x 7 days) posted under three Instagram profiles of 13, 19, and 25 years old.

On the other hand, under the **reach** condition individual Instagram accounts were interacting with e-cigarette related accounts content on Instagram. During the three weeks the three fictitious accounts (13, 19, and 25 years old) followed the same posting content instructions under the post condition mentioned above. In addition only during the second week of the experiment the individual accounts under the reach condition (1) followed ten e-cigarette hashtags, (2) followed 20 e-cigarette related accounts, (3) liked e-cigarette posts, (4) commented on e-cigarette posts, and (5) sent direct messages to e-cigarette related accounts (see Appendix G for more about the reach condition instructions).

Under the post condition the fictitious accounts behavior in Instagram the users were passive and not reactive to others nor reaching out to other accounts users, i.e. the list of 20 e-cigarette retailer and brand accounts (see Appendix H) and other users. While under the reach condition fictitious accounts behavior the users were actively interacting with the list of 20 e-cigarette retailer and brand accounts through Liking, Commenting, and Direct Messages. I differentiated the fictitious accounts online behaviors as post versus reach to evaluate the sensitivity of the Instagram algorithm engine and the e-cigarette retailer and brand accounts toward Instagram users different behaviors.

To summarize, both condition types (post and reach) posted three social posts throughout the entire duration of the study (21 days x 3 posts = 63 social posts) and e-cigarette posts during the second week only (7 days x 3 posts = 21 e-cigarette posts). These posts comprised of memes and e-cigarette gathered from Instagram public images (Appendix D). The total number of posts for each one of the six fictitious account were 84 posts (63 social posts + 21 e-cigarette posts = 84 posts). The only difference between the two conditions (post vs. reach), under reach condition users followed e-cigarette accounts and engaged (through likes, comments, direct messaging) with e-cigarette accounts.

Time

The fictitious accounts were created three days before the first week of the study to allow for Instagram to recognize and activate the account, resolve any issues with the account set-up, and ensure uniformity in how each of the accounts was set up. Also, three hashtags have been followed right after creating the six Instagram accounts these hashtags are related to social posting, namely, #meme, #memes, #funny (see the popular type of posts on Instagram). This was also done to allow for the Instagram algorithm to recognize the account and populate the accounts with newsfeed items at the start of the study.

The first week was designed to develop a baseline for socially active individual accounts though daily posting of memes. The daily social content posting continued every day in the second and third week for all six accounts. In the second week, users either engaged

in posting about e-cigarettes only (post condition) or taken an active role in posting and reaching e-cigarette brands and retailers (reach condition). Finally, all e-cigarette-related activities come to a halt at the end of second week, and the accounts resumed social posting of memes.

I have selected a pool of 63 memes that included pets and other animals with short phrases to indicate social and humorous themes. These images are collected from Instagram and other social media platforms. All memes general and had no indication of age or race or political opinions. Also, users followed three meme hashtags and uploaded their Instagram posts to the account story (see Appendix H). The behavior of the accounts was different only during the second (intervention) week of the study, where the post condition users added another image- and text-based post that is related to e-cigarette use and experiences, whereas the reach condition users were engage in posting, following and interacting with content from e-cigarette retailers and brands.

7.3 Dependent Variables

The study entailed three groups of dependent variables: access, direct communication, and engagement. Each outcome variable was operationalized with different metrics obtained through both human coding and data downloads from Instagram for each account. For data collected manually, two research assistants were tasked with the responsibility of creating the accounts, posting each day, and gathering data by visiting the fictitious user's profile page, taking a screen shot of the main profile page as well as coding data related to the number of posts, followers and accounts being followed. Additionally, the "Tagged" section of the profile was regularly visited to record the number of posts and the actual posts in which the profile owner was tagged. The second form of data collection was carried out by retrieving each account performance through a data download from Instagram that detailed the posts (photos and videos), story uploads, direct messages, saved posts, comments that have been made by the user including the time of each action. The data download was performed at

the end of each week. The data analytic plan is presented in Chapter 8 and the codebook based is presented in Appendix I. Following is a description of each of the main outcome variables.

Access to E-Cigarette Content and Accounts. In this study, I define accessing information as the ability to reach or follow or receive a certain content on Instagram. Therefore, an Instagram user has access to information upon reaching out to a specific profile content, i.e. viewing e-cigarette content through the explore and search feature. Also accessing information was established upon the ability to follow specific profiles, i.e. following e-cigarettes retailer and brand accounts. Based on this, accessing content and accounts was coded as the ability of each account to view, reach, follow, and receive content from a set list of e-cigarette retailer and brand Instagram accounts (see Appendix H for a list of e-cigarette Instagram accounts used in the study).

Direct Communication. Direct communication on Instagram refers to sending or receiving a private piece of content between two account users. A user sending a private message to another user was counted as a direct communication attempt even if the other user did not respond to that attempt. Also, an Instagram user has the option to accept, ignore, or block other users from sending them direct communication. Therefore, a direct communication also comprised any attempt by other users to reach or respond to them through the private message (direct message) option on Instagram.

Engagement. Engagement on Instagram refers to any activity by another user to interact with the original content posted by the fictitious user in the form of liking and commenting on any fictitious account user posts.

7.4 Pretest

A pretest with one fictitious account has been done to test the experiment design capacities to access information, direct communication, and engagement related to e-cigarette. An Instagram fictitious account was created with a male profile owner aged 25 using the

user behavior of reach over a three-week period. Based on that, one fictitious Instagram account has been created and ran with social posts of memes contents for the first week, the second week ran with social posts of memes and e-cigarette content, and third week ran with social posts only. The study protocols, social posting, and e-cigarette contents posting were the same that have been used in the main study as described in Appendixes C-G. With regard to the ability to access, the fictitious account accessed 20 of the 20 e-cigarette retailers and brands on Instagram. Over the course of 21 days, the fictitious account received 340 e-cigarettes posts in the newsfeed, out of 519 total newsfeed posts coded (see appendix B). With regard to engagement with the fictitious user's posts, our findings showed a greater number of likes (M = 1.81, SD = 1.25) and comments (M = 0.14, SD = 0.36) for user posts related to e-cigarettes compared to neutral posts (Likes: M = 0.26, SD = 0.45; Comments: (M = 0.00, SD = 0.00). Finally, over the 21 days, the fictitious account received no direct messages and a single mention from e-cigarette retailers and brands on Instagram.

7.5 Data Collection Plan

Data collection and coding included two levels of collecting and processing Instagram accounts data (visit Appendix I: Code Book for Data Analytic Plan).

Account Home Page Data. Two trained coders collected data about the ability to access other accounts contents and actions that have been done by others to the fictitious account content every day. These actions included the frequency of being tagged (other account tagging the fictitious account), liked posts, liked comments, comments on the account content, followers, unfollow, reply to all comments made by the account user on the posts, and direct messages.

Data Retrieval. Finally, a downloadable version of user data activity was retrieved through Instagram settings at the end of each week and included the following information:

1. Posted photos and videos with the caption, time of uploading, added location, and a reference for the post path.

2. Story upload of photos with the caption, time of uploading, added location, and a reference for the post path.

3. Profile photo with the caption, time of uploading, added location for the photo, and a reference for the photo path.

4. All comments, likes, direct messages, connections, saved content from feeds, searches, settings made by the account user.

7.6 Data Analytic Plan

To answer the study's research questions, I aggregated different data types and formats and thematically grouped them to three facets of outcome variables of interest in this study as they relate to access, direct communication, and engagement. In all of these three areas, coded and retrieved data were summed per condition, thus allowing for analysis of outcome variables using a 3 (age groups) x 2 (behavior intervention type) x 21 (days) ANOVAs which allowed for detecting main effects of age groups and behavior intervention type as well as the interaction between them. Additionally, subsequent analysis was performed rely on binary (dichotomous) data, whereby Chi-Square analyses, logistic regression model, and Poisson regression were applied.

CHAPTER 8

RESULTS

8.1 Accessing E-Cigarette Content

Research Question 1 explored the difference among the three fictitious account age groups in accessing e-cigarette content from retailers and brands on Instagram. To answer this research question, each of the six accounts developed for this study attempted viewing and following 20 different e-cigarette retailer Instagram accounts, thus amounting to 120 attempts to view the e-cigarette retailer Instagram accounts. All successful viewing attempts were coded as "1" and failure to do so as "0".

Data for accessing the e-cigarette retailers and brands Instagram account were submitted to a Chi-Square analysis. Results showed that of the 120 attempts to access the e-cigarette pages, the different accounts were successful in accessing 102 (85%) of those attempts, $\chi^2(1) = 58.80, p < .001$, thus indicating greater prevalence of success in accessing e-cigarette pages than failure attempts. Another Chi-Square analysis was conducted to compare accessibility to the e-cigarette Instagram account across the three age categories of the fictitious users, $\chi^2(2) = 4.706, p = .095$. As depicted in Figure 8.1, of the 40 attempts by each age category (20 per user; 2 users in each age category), 13-year-old fictitious accounts accessed 30 (75%) accounts, and both 19- and 25-year old fictitious users each accessed 36 of (90% for each). As indicated in the Chi-Square analysis, the three age groups were not significantly different in accessing e-cigarette retailers and brands Instagram accounts. It is important here to mention that there is a 100% accessibility to Instagram content from following social based hashtags and e-cigarette-based hashtags in all the different fictitious Instagram accounts.

While the first RQ dealt with the success of viewing the different e-cigarette accounts, the second RQ explored the difference between the fictitious user behavior (post vs. reach)

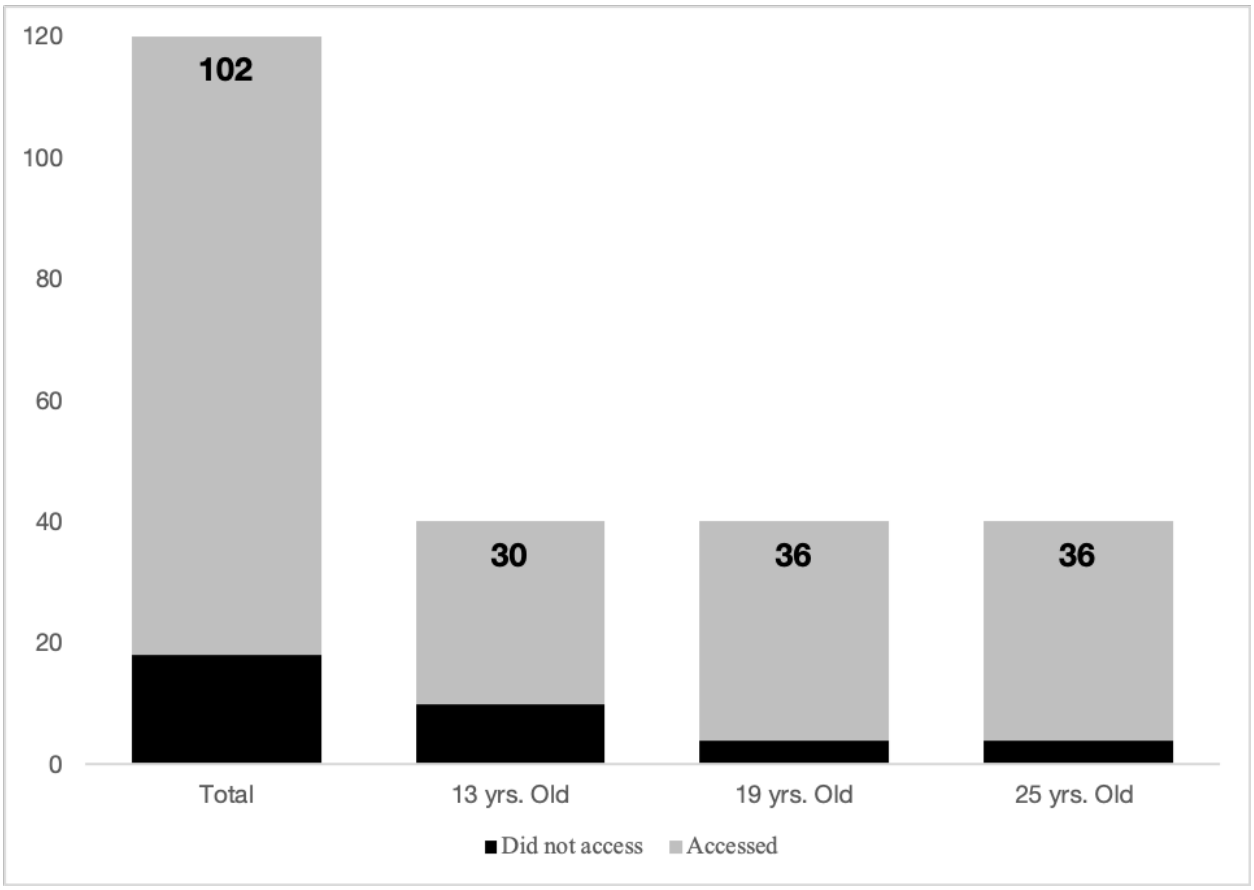

Figure 8.1: Frequency of attempts to access e-cigarette Instagram accounts, by age

in accessing those accounts. As depicted in Figure 8.2, only nine (15%) of the post accounts and another 9 (15%) of the reach accounts were not successful in accessing the e-cigarette Instagram accounts, $\chi^2(1) < .001, ns$. Therefore, there were no significant differences between post and reach accounts in accessing e-cigarette Instagram accounts.

In addition to assessing the success of access attempts, each of the 20 accounts' bio description was analyzed. Of the 20 accounts examined here, only 60% mentioned MLA restrictions, 10% included a health warning, and 15% required approval of the "Follow" request before viewing profile content. Additionally, 65% of the accounts' bio content included words and phrases that promoted e-cigarette, 100% included sale/buy leads, 20% included social media links related to promoting e-cigarette, 30% included at least one e-cigarette hashtag, and 95% included business information (see Figure 8.3: Accounts' bio information). Upon

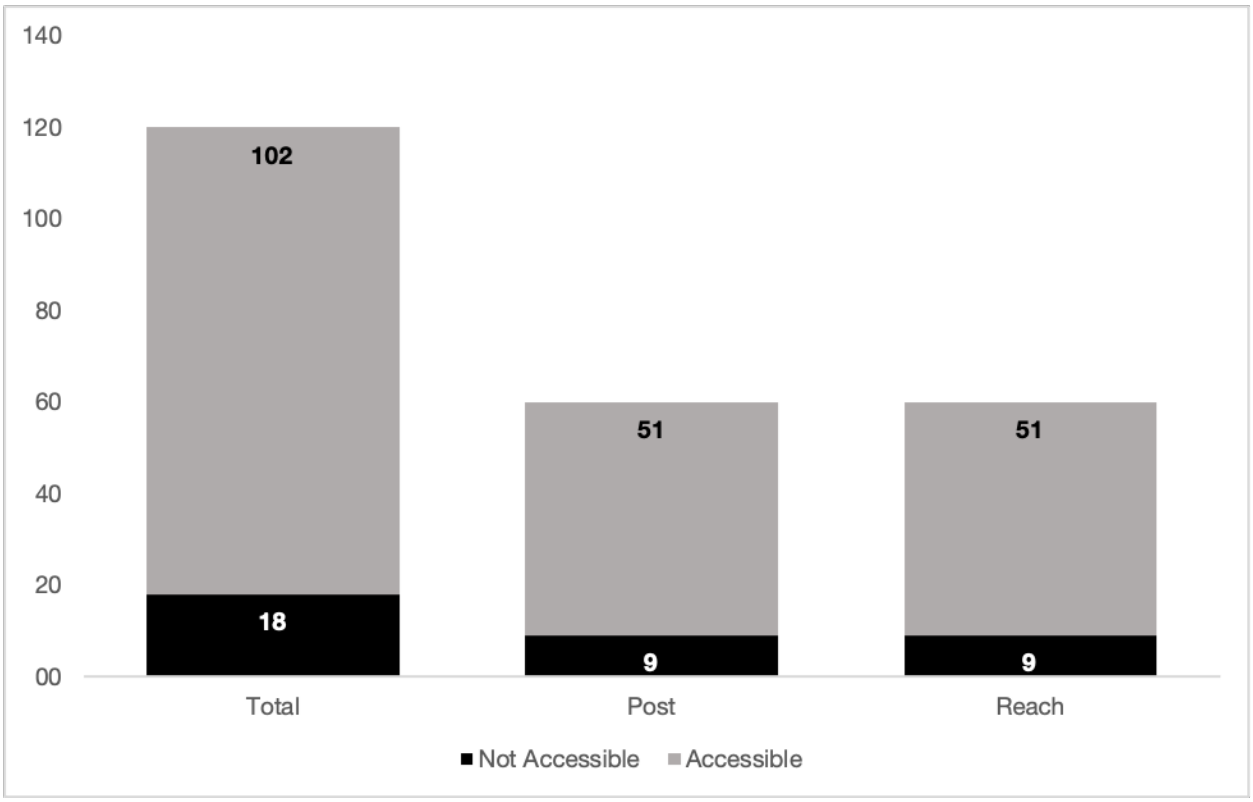

Figure 8.2: Frequency of attempts to access e-cigarette Instagram accounts by user behavior condition

further examination of the landing pages linked in the accounts‘ bios, over one-third of those page (37.5%) did not entail any age-gating as they did not include any MLA qualifications restrictions. Additionally, more than eight in 10 of the landing pages (82%) failed to include any health warning related to e-cigarette consumption. Finally, the 20 e-cigarette accounts had an average of 2,780 posts ($Range = 12$ to 14,100, $SD = 3{,}332$), 136,321 followers ($Range = 62$ to 472,000, $SD = 150{,}408$) and number of followers 1,234 on average ($Range = 6$ to 4,544, $SD = 1332\ 3{,}332$).

Research Question 3 explore the effect of the interaction between fictitious users' age category and user behavior on the success of accessing the 20 e-cigarette Instagram accounts. To assess the effect of the interaction the success of access attempt was submitted to a binomial logistic regression. The logistic regression model was not statistically significant, $\chi^2(5) = 6.765$, $Nagelkerke\ R^2 = .10, ns.$ Neither the direct effect of age category, B =

1,85, SE = 1.15, ns, user behavior condition, $B =< .001, SE = .73, ns$, nor the interaction between the two variables, $B = 1.21, SE = 1.41, ns$, were significant. Based on this, it is concluded that the interaction between age category and user behavior did not incur a significant difference in the likelihood of accessing the e-cigarette Instagram accounts.

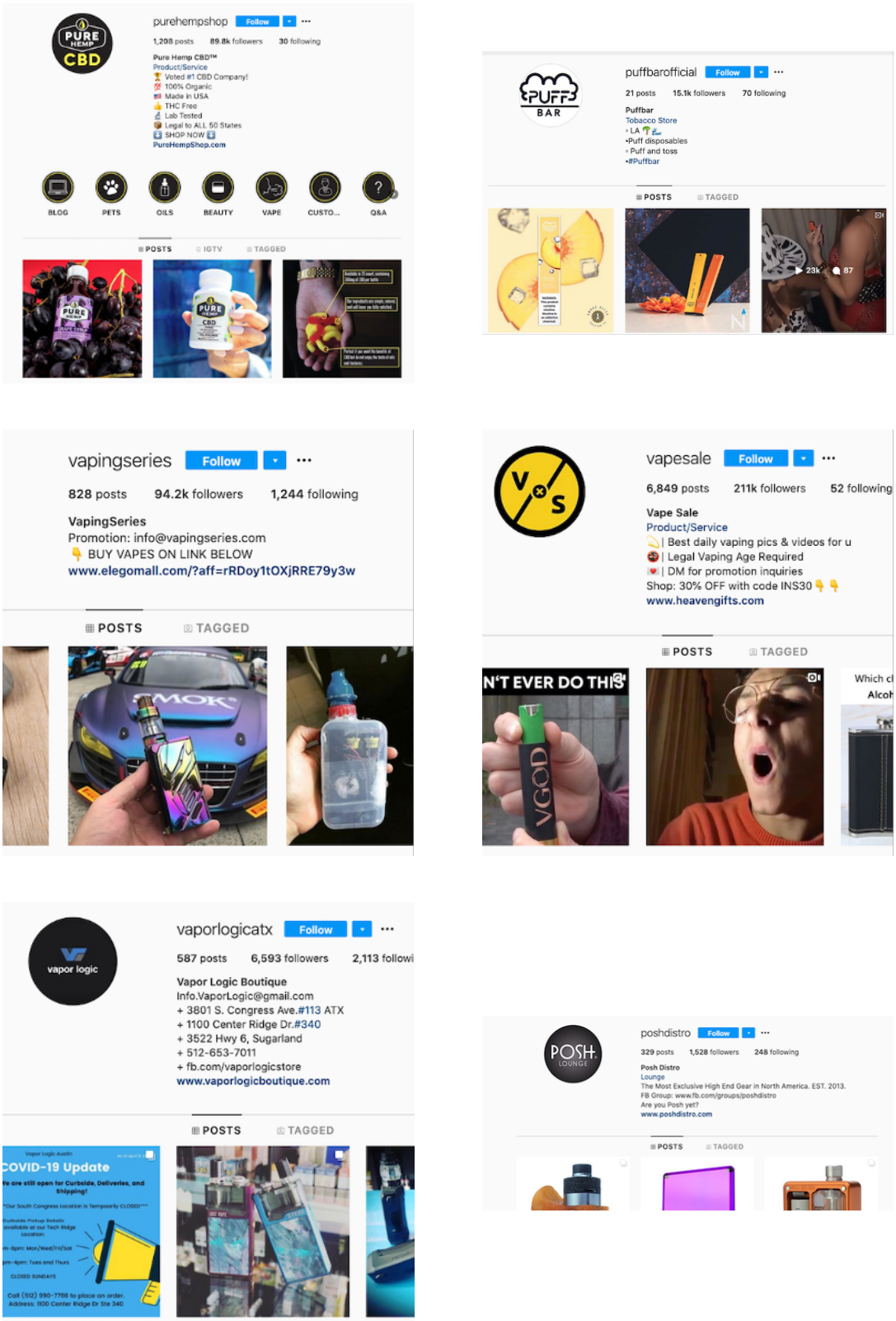

Figure 8.3: Screenshots of e-cigarette retailers' Instagram bio pages

8.2 Receiving direct e-cigarette messages (DM)

Research Question 4 examined differences among the three age categories of fictitious users in receiving direct communication from e-cigarette Instagram accounts. Data for direct communication were only collected for the three age category accounts in the reach condition, given that the post-only accounts did not embark on reaching out and directly messaging the different e-cigarette Instagram accounts. For the period of one week (intervention week), each of the accounts sent a direct message to three of the followed e-cigarette Instagram accounts, thus each fictitious account attempted to direct message the e-cigarette accounts 21 times over the course of the intervention week, thus totaling to 63 attempts. Of the 63 direct messaging attempts, the three accounts combined were successful in receiving a reply to their direct message attempt 20 times (31.75%), and there were clear differences across the different age groups in that the 13-year-old account only received two DM replies (9.52%), whereas the 19-year-old account received eight direct message replies (38.10%) and the 25-year-old received 10 replies in total (47.62%), $\chi^2(2) = 8.56, p = .014$ (see Figure 8.4).

Furthermore, I conducted a binary logistic regression model to answer the same research question. The model was fitted using direct communications as a criterion (0 = no, 1 = yes) and age group as a predictor. The model significantly fit the data, $chi^2(2) = 8.56, p = .013, -2Loglikelihood = 70.18, Cox\&SnellR2 = .13, NagelkerkeR2 = .18$, thus indicating that the model can explain between 12.7% and 17.8% of the variance in direct communication behavior. Additionally, the model was able to classify 68.3% of the cases correctly. The unstandardized coefficient for the constant was significant, $\beta = -2.25, SE = .74, Wald = 9.17, Exp(\beta) = .11, p = .002$. The coefficient for the 19-year old age group was significant, $\beta = 1.77, SE = .87, Wald = 4.13, Exp(\beta) = 5.85, p = .042$, as well as for the 25-year old age group, $\beta = 2.16, SE = .86, Wald = 6.25, Exp(\beta) = 8.64, p = .012$. With that in mind, the odds of being directly contacted by e-cigarette retailers were 5.85 times higher in the 19-age group and 8.64 times higher in the 25-age group compared with the 13-age group. It is worth mentioning that the data for direct messaging was only available for the reach

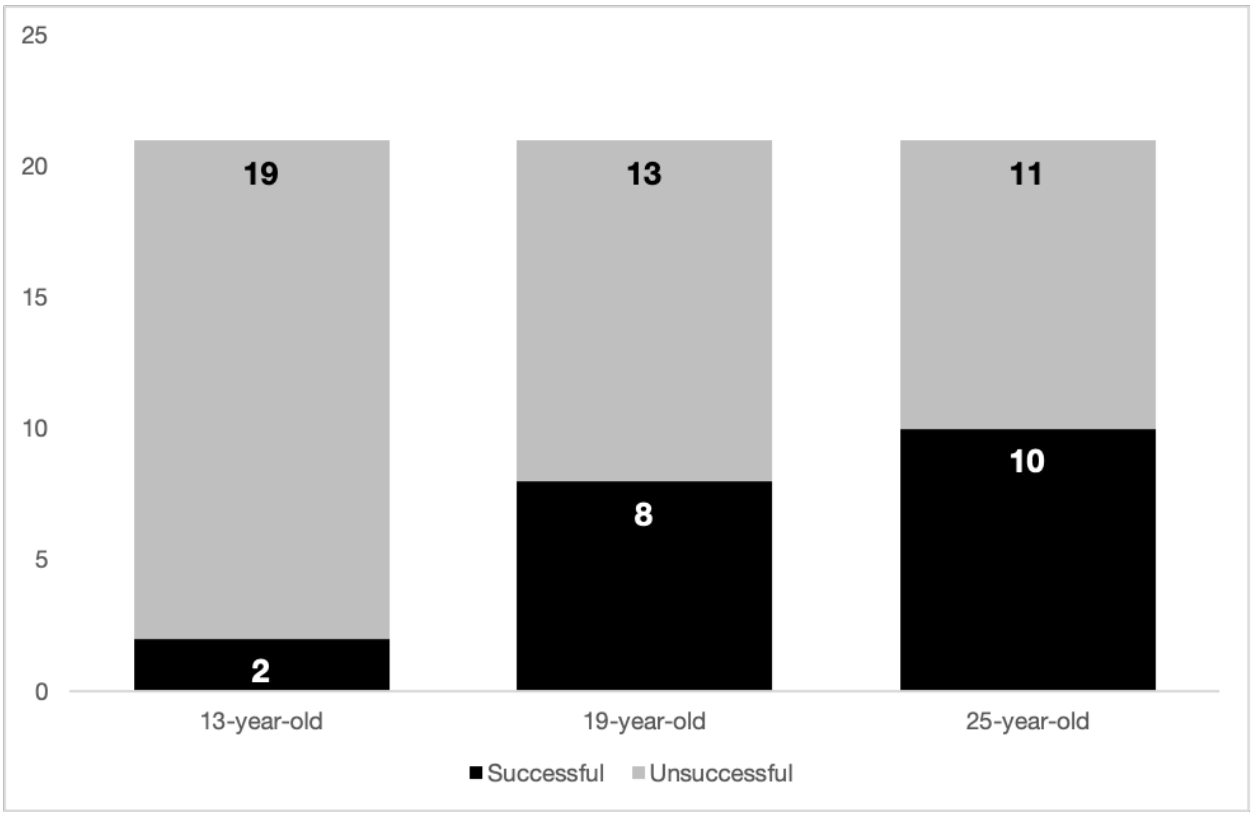

Figure 8.4: Frequency of Successful and Unsuccessful Direct Messaging Attempts by E-Cigarette Retailer Accounts to Fictitious User Accounts

condition accounts, as the post-only conditions did not engage in any activities that would lend themselves to the opportunity of receiving a direct reply from an e-cigarette retailer Instagram account.

8.3 Engagement with e-cigarette content

The fifth research questions dealt with difference among the three fictitious account age groups in terms of engagement with user posts by e-cigarette retailers and brands on Instagram during week one and week two. Operationally, engagement was measured by the number of likes and comments for 84 posts for each account. During the 21 days, of the three-week study, each account posted 3 memes every day. Also, each fictitious account posted three e-cigarette images during the second week in addition to the three memes, for a total of six posts each day (only during the second week of the study). For this research

question we limited the data analysis for the engagement for week one and week two.

First, I compared the effects of age, post condition (post or reach), and time (week 1 or week 2) on engagement of accounts that interacted with "memes" using zero-inflated Poisson regression. Where the age groups (13 vs. 19 vs. 25) and post conditions (post vs. reach) were entered into the model as independent variables and the engagement (week 1 mems vs. week 2 memes vs. week 2 e-cigarette) were entered as dependent variable. Findings showed that the odds of not having engagements (zero engagement) was not significantly different between the first and second weeks of the study (relevant to posting memes only), $Estimate$ = -3.32, SE = 9.71, $Z - value$ = -.342, ns. As for the differences among the three age groups in terms of engagement, among those accounts with engagements, account with an age of 19 years decreases the expected rate of engagements by 82% compared with account for fictitious users aged 13 years old, holding other variables constant, $Estimate$ = -1.70, SE = .42, $Z - Value = -4.02, p < .001$. On the other hand, the expected rate of engagement was not significantly changed in age group 25 compared to age group 13 years, $Estimate$ = .10, SE = .25, $Z - Value$ = .40, ns. Similarly, reach condition increases the expected rate of engagements by 156% (exp(0.942)) compared to the post-only condition holding other variables constant, and this is statistically significant, $Estimate$ = .94, SE = .26, $Z - Value = 3.70, p < .001$.

Before examining the differences in engagement between memes and e-cigarettes posts, it was important isolate any longitudinal effects. To do so, data for engagement in long form (regarding each post as a separate case) were submitted to a 3 (age group) x 2 (interaction type) x 2 (weeks) to compare engagement for memes between the first the second weeks of the field experiment. Results showed that engagement with memes was different as a function of the fictitious account's age, $F(2, 237) = 10.19, p < .001, \eta^2 p = .08$, where engagement was lowest with posts by the 19-year-old account ($M = .09, SD = .36$), and that for the 13-year-old ($M = .45, SD = .67$) and 25-year-old ($M = .48, SD = .87$) were relatively equal. Planned post-hoc analyses showed that the 13- and 25-year-old accounts did not

differ significantly, yet they were both significantly different from the 19-year-old account ($p < .001$). Engagement with memes was also different as a function of interaction type, $F(1, 237) = 12.34, p = .001, \eta^2 p = .05$, where memes posted by post-only accounts ($M = .20, SD = .55$) were significantly lower than that for the reach accounts ($M = .48, SD = .81$). The main effect of intervention week, comparing engagement with memes across the first and second week of the study was not significant, $F(1, 237) = 1.65, ns$. Additionally, the effect of the interaction between age group and interaction type was significant, $F(2, 237) = 3.48, p = .03, \eta^2 p = .03$ (see Figure 8.5A), and so was the two-way interaction between age and intervention week, $F(2, 237) = 3.61, p = .03, \eta^2 p = .03$ (see Figure 8.5B), and interaction type and intervention week, $F(1, 237) = 12.82, p < .001, \eta^2 p = .05$ (see Figure 8.5C), as well as the three-way interaction between age group, interaction type, and intervention week, $F(2, 237) = 5.04, p = .007, \eta^2 p = .04$ (see Figure 8.5D).

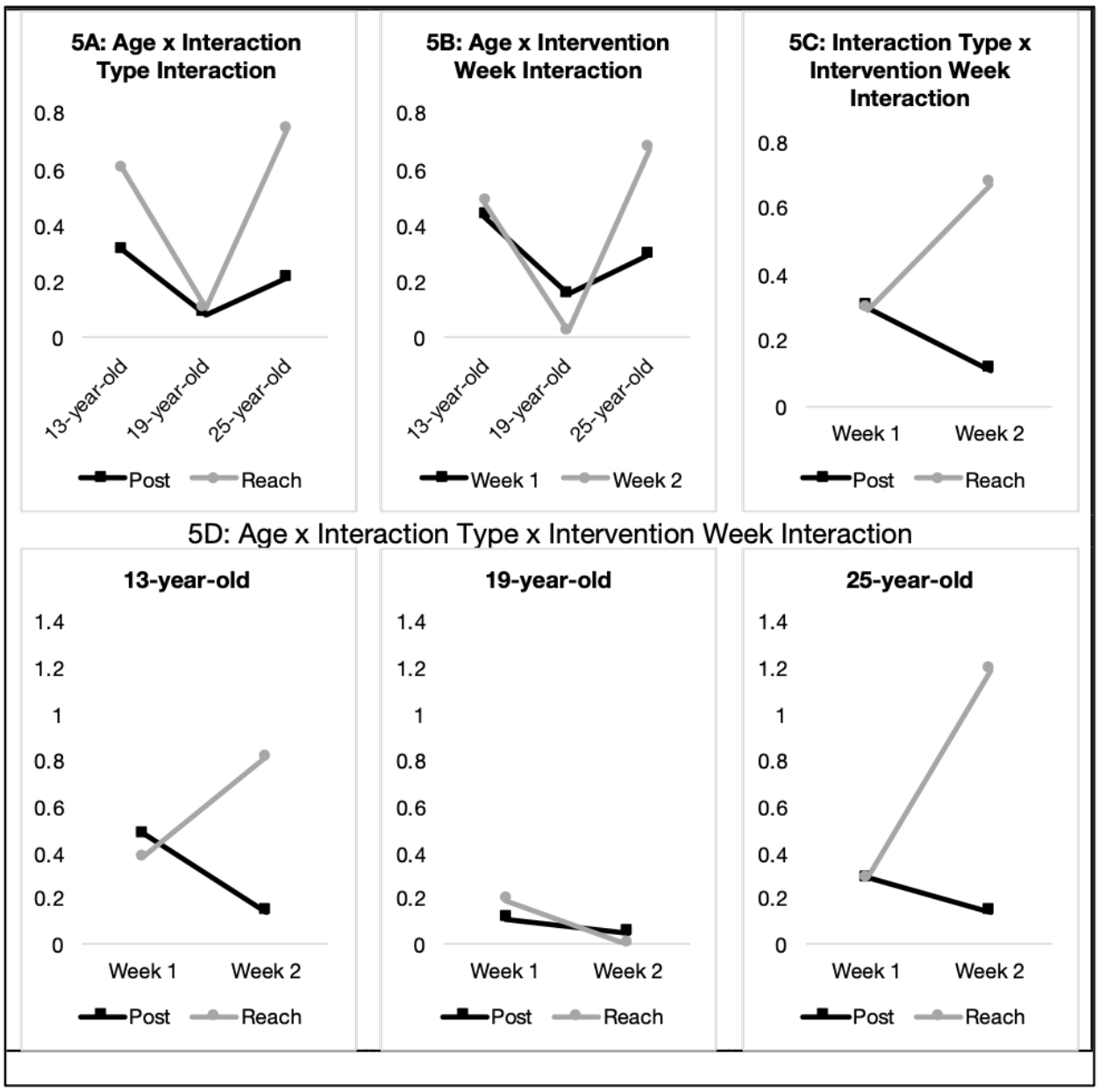

Figure 8.5: Two-way and three-way interaction effects of age groups, interaction type, and intervention week for engagement with memes

To examine the effects of fictitious account age and interaction type on engagement with memes and e-cigarette posts, long-form data for engagement for the second week of the study was used by regarding each post as a separate case for analysis. Engagement data were submitted to a 3 (age group: 13 vs. 19 vs. 25) x 2 (interaction type: post vs. reach) x 2 (post type: meme vs. e-cigarette) ANOVA. In the second week of the study,

use accounts received different levels of engagement as a function of the fictitious user's age, $F(2, 231) = 26.51, p < .001, \eta^2 p = .19$, where 25-year-old accounts received the highest engagement ($M = 1.60, SD = 1.89$), followed by 13-year-old ($M = .86, SD = 1.01$), and 19-year-old ($M = .49, SD = .74$) accounts, respectively. Engagement was also different as a function of account interaction type (post vs. reach), $F(1, 231) = 48.67, p < .001, \eta^2 p = .17$, where reach accounts garnered significantly higher ($M = 1.41, SD = 1.64$) engagement than post-only accounts ($M = .51, SD = .81$). Engagement with e-cigarette posts ($M = 1.62, SD = 1.59$) was higher than memes posts ($M = .39, SD = .77$), $F(1, 231) = 92.12, p < .001, \eta^2 p = .29$. The following two-way interactions were significant: age group and interaction type, $F(2, 237) = 15.89, p < .001, \eta^2 p = .12$ (see Figure 8.6A); age group and post type, $F(2, 231) = 6.77, p = .001, \eta^2 p = .06$ (see Figure 8.6B); and interaction type and post type, $F(1, 231) = 6.15, p = .01, \eta^2 p = .03$ (see Figure 8.6C). Additionally, the three-way interaction among age group, interaction type, and post type was significant, $F(2, 231) = 5.07, p = .007, \eta^2 p = .04$ (see Figure 8.6D).

As shown in Figure 8.6A, across all age groups, reach condition accounts received greater engagement compared to the post-only condition, yet this difference was larger for older account users (25-year-old). Consistently across different age groups, as shown in Figure 8.6B, e-cigarette posts received higher engagement compared to memes posts, and this difference was the largest for 25-year-old accounts, and also higher for reach compared to post-only conditions, as shown in Figure 8.6C. Finally, looking the at three-way interaction in Figure 8.6D, we can see that across the board, e-cigarette posts received higher engagement, and the engagement was highest when the account proactively interacted with e-cigarette retailers on Instagram (reach condition). Despite the fact that engagement was lower for younger accounts (13 and 19 years old) compared to the above-MLA account (25 years old), younger accounts still exhibited engagement with their e-cigarette posts at a higher rate than the neutral (meme) posts.

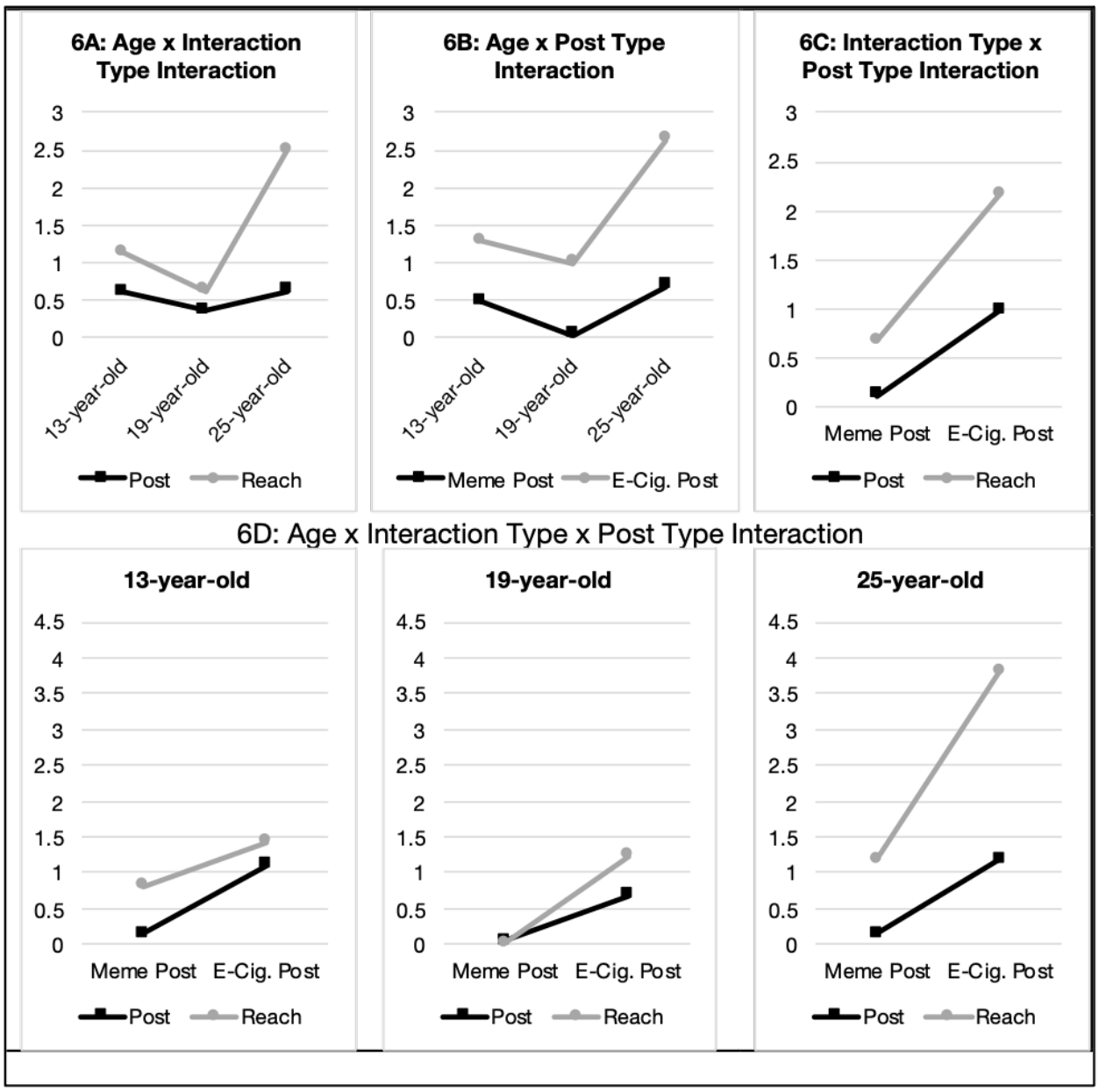

Figure 8.6: Two-way and three-way interaction effects of age groups, interaction type, and post type on post engagement.

CHAPTER 9

DISCUSSION

The current study's chief objective was to examine the ease and types of access to and engagement with e-cigarette retailers on Instagram among individuals below and above the MLA for purchase of electronic cigarettes. In doing so, this study aimed to uncover e-cigarette marketing and advertising practices and assess their compliance with federal regulations. The Family Smoking Prevention and Tobacco Control Act places restrictions on the branding, labeling, advertising warnings, warning label statements, advertising and promotion restrictions, product features, and points-of-sale marketing of e-cigarette products to those who are of minimum legal age (MLA; FDA, 2009). Therefore, to refle'ct compliance with existing regulations, Instagram users below MLA should not be able to access or be targeted by e-cigarette content or allowed to post e-cigarette content. Generally, the study's findings showed that most accounts, regardless of the fictitious users' age, were able to access Instagram accounts promoting the use and sale of e-cigarettes. Age group differences were observed, however, for the opportunity to receive direct communication from e-cigarette retailers on Instagram. Finally, age group and interaction type differences were observed in regard to engagement with e-cigarette content posted by the fictitious user accounts.

In this dissertation, I argued that introducing e-cigarettes to consumers market is a clear effort to rebrand tobacco consumption and nicotine addiction through new product design to reverse the reduction on tobacco companies' market shares in the last two decades. Beyond the study findings discussed above, past research and reports pointed to the huge investment and contribution of traditional cigarette companies in e-cigarette production, marketing, and promotions, like Altria Group, Ballantyne Brands, Hay Island Holding, Reynolds American, and Swedish Match AB. In the United States, multinational tobacco companies are leading e-cigarette industry through acquiring and investing in vaping establishments and lobbying to oppose vaping industry hefty taxation and consumer protection regulations (Open Secretes,

2018). For example, in 2018 Altria Group, makers of top-selling cigarettes brands like Marlboro, invested $13 billion to acquire 35% of Juul Labs shares, which is the top e-cigarette company over the past few years (LaVito, 2018; Cenicola, 2019). Atria Group also lunched its Market Ten e-cigarette brand. Imperial Tobacco Group and Lorillard acquired Blu e-cigarette, a leading e-cigarette brand, Lorillard acquired Skycig, and Reynolds American lunched its Vuse e-cigarette (Goodman, 2013, December 5; Open Secretes, 2018). In 2014 and 2015, the big tobacco makers like Reynolds American and Atria Groups spent $23.6 million lobbying about e-cigarettes with federal candidates and political parties. While in 2018, Juul Labs spent more than $1.5 million only on lobbying operations in Washington, D.C. (Mcminn, 2019, January 23).

9.1 Summary of findings

9.1.1 Underage Users Access to E-cigarette Content.

This study's findings showed that the majority of attempts to access e-cigarette retailers' Instagram account were successful, regardless of the age of the fictitious user. However, our findings also showed that the success rate was slightly, though not significantly, lower for younger users (13-year-old; 75%) compared to users aged 19 and 25 (90% for both). Furthermore, when all of the fictitious accounts followed social based hashtags and e-cigarette-based hashtags they accessed e-cigarette content 100% of the time. These results show that there are no age restrictions or effective age-gating (age verification) system in place to restrict access to e-cigarette content on Instagram among vulnerable populations based on MLA for e-cigarette purchase.

The second notable finding related to accessing e-cigarette retailers' Instagram account dealt with the non-significant differences as a function of the accounts' interaction type (post vs. reach). Additionally, these differences between the post and reach conditions were not significant across the three age groups of fictitious users. While there would be no reason to hypothesize about such a difference as a function of user activity in terms of accessing

e-cigarette content, it is noteworthy in a sense that despite the actions of the user, they were still able to majorly access and follow e-cigarette accounts. From an algorithmic and system-design perspective, this is extremely important given that algorithm can be designed in such a way to determine the risk level of the user as a much-needed capability of the algorithm to restrict access to risky content promoting use of e-cigarettes. In other words, algorithms should take into consideration users' activity as they enforce age verification and restriction mechanisms to access harmful content.

9.1.2 Direct Communication with Underage Users.

To assess the potential for receiving direct communication from e-cigarette retailers, each fictitious account attempted to send a direct message the e-cigarette accounts 21 times. The 13-year-old account received two DM replies (9.52%), whereas the 19-year-old account received eight DM replies (38.10%) and the 25-year-old received 10 replies in total (47.62%). By reviewing the type of responses received from the e-cigarette accounts through the direct communication, the underage fictitious account (13 years old) received automated responses in texts and images all promoting e-cigarette products through discount, leading link to order kits, placing the price, and attractive images. While for factitious accounts with 19 year old and 25 years old, they received automated and personalized responses that include texts and images all promoting e-cigarette products through presenting information about new products release, suggesting trying e-cigarette as a positive and attractive lifestyle and experience, given free products, discounted products, mentioning the price, providing links for purchase, providing leading social media links and leads, replying with socially desirable respond (heart like), using the first name to address the fictitious accounts owners (see Figure 9.1). These results indicate that although the underage account did receive some DM responses, they received them at a lower frequency than older age groups (19 and 25). It is also noteworthy that the qualitative assessment of the type of direct message received from e-retailers, especially that the two messages received by the 13-year-old accounts were automated, signals

that e-cigarette retailers moderating interactions with consumers on Instagram could have accounted for the restrictions to engage with underage users. For e-cigarette marketers and advertisers on social media platforms like Instagram, this finding calls for the need to enforce human-moderated engagement with consumers to ensure compliance with MLA restrictions when it comes to promoting e-cigarettes online. On the other hand, this calls for system designers on social media platforms like Instagram to improve the quality of business account settings to ensure the ability to restrict automated communication with vulnerable populations. It is worth stating that this finding is limited to reach condition accounts, as the post-only accounts did not engage in any direct communication with any of the e-cigarette retailers, thus there was no opportunity to get a response from them.

9.1.3 Engagement with Underage Users.

The study also investigated whether fictitious users' age or type of interaction on Instagram influenced engagement (likes and comments) received on both neutral and e-cigarette content posted by the fictitious accounts. The study's findings showed that engagement was significantly increased in week two compared with week one for the interaction of both post-only and reach conditions. Without consideration of the type of Instagram post published by the fictitious users, this finding points to the impact of longevity on the network in terms of noticeability and increasing opportunities for engagement with other users.

When looking specifically at the engagement rate for memes (neutral) and e-cigarette posts in the second week of the study, a number of insights emerged. First, we see that e-cigarette posts by the same fictitious user, regardless of their age, garnered higher engagement than the neutral posts. Post-only accounts received significantly lower engagement for both e-cigarette and memes posts. However, for accounts that engaged with e-cigarette retailers (reach) by liking their content and direct messaging them, they received significantly higher engagement for e-cigarette than neutral posts. These differences were further amplified for users who were above the MLA for e-cigarette purchase, despite the fact that users who were

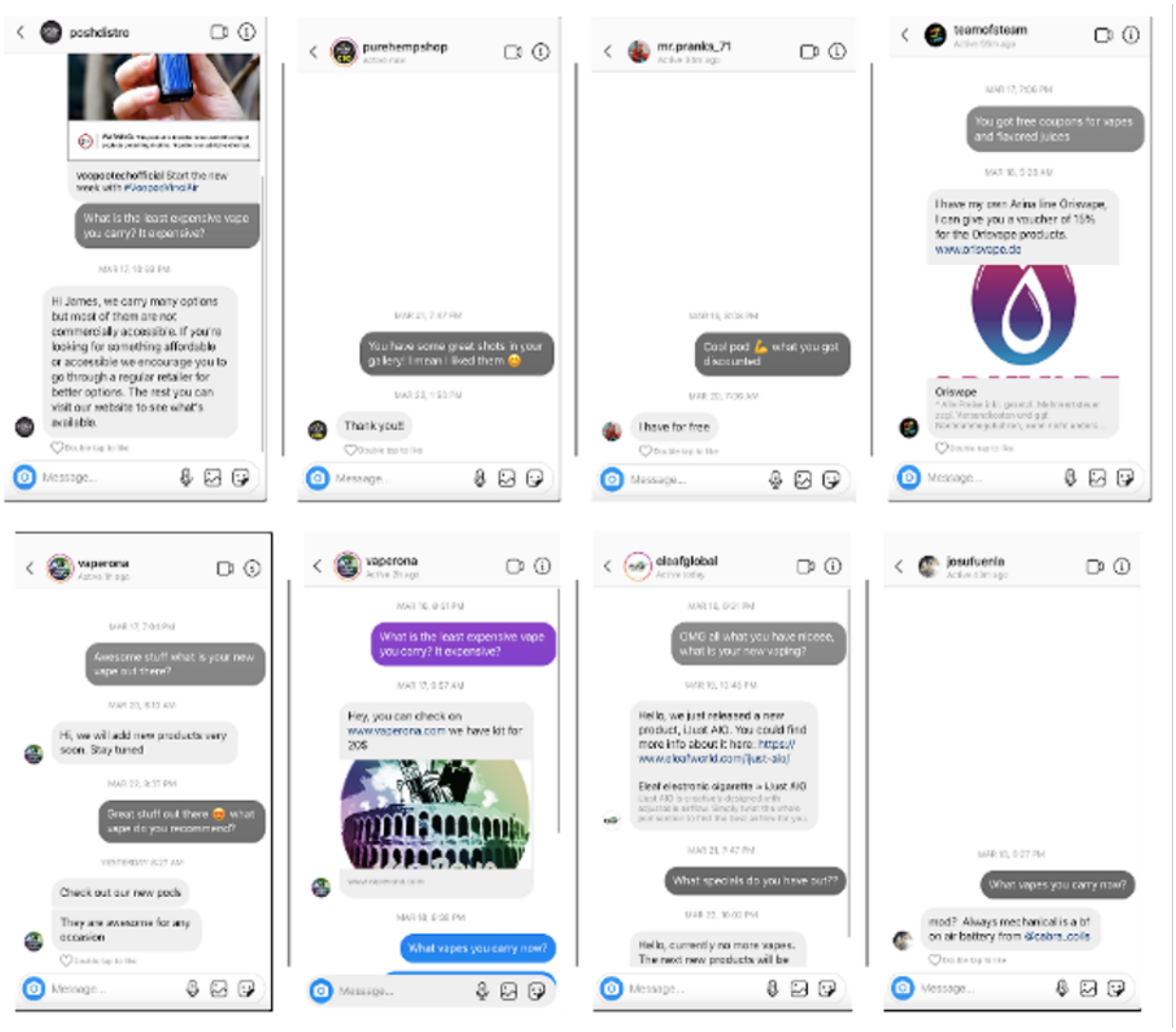

Figure 9.1: Instagram direct communication examples

clearly below the MLA (13-year-old) and those bordering the MLA (19-year-old) received higher engagement for e-cigarette than neutral (memes) posts. Under the reach condition, the fictitious account of 25-year-old users received significantly higher engagement compared with 19- or 13-age group. Additionally, under the same condition, 13-year-old fictitious account received significantly higher level of engagement compared to the 19 years old account ($p = 0.01$). While the account in which the age was set above MLA (25 years old) received the highest engagement.

The V-shaped trend found in the engagement analysis of the two-way interaction effects

through (see Figures 8.5 and 8.6) suggested clear targeting to underage group (13 years old) without a consideration for the LMA restrictions, while at the same time, potentially not investing resources and actions toward targeting of the 19 year-old account. It is clear from these findings that the regulatory permissions were met with aggressive targeting of accounts that were clearly above the MLA. Where it becomes problematic is the difference between the adolescent (13-year-old) and the other emerging adult account (19-year-old). In other words, should the e-cigarette retailers and marketers abide by the regulatory restrictions, the raw score for engagement with the e-cigarette posts should be "0" for the younger account, with incremental increase in engagement with the abigious account of the 19-year-old. However, we notice heavier investiment in reaching out to the younger generation, and less interest in the ambiguous age group. There are multiple plausible explanations for this trend. First, this suggests a clear failure of the social media algorithm to be programmed in a way that protects vulnerable populations. The fact that these automated and human-initiated interactions occurred within the system shows a clear disregard for the ethical concerns with regarding to marketing harmful and addictive substances of vulnerable and underage populations. This certainly brings a dichotomy of "could" vs. "should" when it comes to algorithmic curation and development of systems that are centered on human-computer interaction as well as a human-human computer-mediated communication. The evidence reported here suggests a failure of the algorithm to protect and act in an ethical way. The second interesting findings is the inferiority of the ambiguous age group to e-cigarette marketers and retailer attempts. This certainly requires further exploration using multi-method approaches to better understand the reason behind this discrepancy in the results. However, it could be possible that this particular age group is not a priority for certain marketing objectives. Given that they have considerable autonomy over their spending and behaviors, and a significant portion of them are e-cigarette users, e-cigarette retailers and marketers might not have perceived them as a viable target segment for attitude and behavior change. Another plausible explanation is that this age segment might be present in larger

numbers on Instagram with previous behavior of engaging with e-cigarette content, then adding a few more consumers was diffused in comparison to the overall size of this group on Instagram. In all, this finding calls for more transparency in how the Instagram algorithm works vis--vis targeting of underage and vulnerable populations with harmful content.

9.2 Empirical and Policy Implications

To date, there is little research into the strategies implemented by e-cigarette brands and retailers to attracted and target teenagers on popular social media platforms. This study provides novel insight into the strategies implemented by e-cigarette brands and retailers to attract and target adolescence on Instagram. The method employed in this study has been previously used by Barry et al. (2015; 2016) within the context of access to and exposure to alcohol marketing content on popular social media platforms like YouTube, Instagram and Twitter. In their studies, Barry and colleagues attempted to access content by leading alcohol brands on different social media and social networking platforms, and showed the ease of doing so, thus indicating breaches to self-regulatory guidelines within the alcohol industry. Their novel method ushered the way for leveraging empirical research as a means of illustrating violations of ethical and regulatory principles and guidelines. The context of e-cigarette, while holding considerable parallels to the case of alcohol marketing on social media, is somewhat different. Unlike the self-regulatory nature of the marketing and advertising of alcohol, when it comes to promotion of cigarettes and smoking-related products, federal guidelines are in place like (U.S Food and Drug, 2020). However, these guidelines are vaguely and variably enforced with regard to e-cigarettes, let alone the complex context of social media marketing and advertising of e-cigarettes.

This study provides valuable information by showing that e-cigarette brands and retailers are doing little to none to restrict underage Instagram users from accessing, directly communicating, and engaging with their content. The FDA has routinely insisted that underage youth are being targeted by the e-cigarette industry; however, the e-cigarette industry con-

tinually denies these claims. However, industry reports (e.g., Cenicola, 2019; Huang et al., 2018; LaVito 2018; Richardson, Ganz, & Vallone, 2015) indicate that e-cigarette marketers are resorting to indirect ways of targeting young consumers, including influencer marketing and investment in brand-related communities. For example, there are e-cigarette liquid brands named *Frank'N Vape E-liquid and Franken Berry cereal*, which the FDA believes have been created to target underage youth (FDA Center for Tobacco Products, 2018). The current study provides evidence that the e-cigarette industry is at the very least allowing underage users to access and engage their content, or at best, not proactively restricting access and engagement with underage youth. The findings reported here are critical in advocating for stricter regulations related to the diverse set of marketing tactics used by the e-cigarette industry targeting youth and young adults, and thus exposing vulnerable populations to eminent public health risks and harms. These findings also call for e-cigarette marketers and retailers to ensure they are acting in ethical ways by protecting vulnerable populations from being influenced by content they promote via social media. E-cigarette brands and retailers should, at least, ensure they activate age-gating on all their public promotional materials on social media, as well as ensure human-moderation of direct communication, promotion, and engagement with consumers to ensure compliance with MLA restrictions pertaining to promotion of e-cigarettes through digital technologies.

In addition to the responsibilities of e-cigarette retailers and brands as well as policy makers, social media platforms also bear a share of responsibility. Our findings suggest an important role of social media algorithm in limiting and restricting e-cigarette marketers from reaching underage papulations. Last year, Instagram's parent company, Facebook, updated its community guidelines, whereby the platforms prohibited "all private sales, trades, transfers and gifting of alcohol and tobacco," which expanded on their previous policy banning sales of alcohol and tobacco products on their marketplace platforms (Mihalcik, 2019). Despite the latest extension to sales-related activities among private individuals (accounts), the updated policy does not encompass the same restriction with regard to organic posts that

glorify the use of e-cigarettes, tobacco and alcohol products, and more importantly, the policy does not enforce any restrictions to influencer posts that promote the use of e-cigarettes. While a step in the right direction, our findings show that it might not be successful in curbing the influence of e-cigarette marketing and advertising that transcends the boundaries of clear advertising/marketing attempts. It is worth noting that the data for this dissertation were collected prior to the recent 2019 change in Instagram's community guidelines. Instagram is still a key player in the digital marketing business, through providing the platform as an advertising platform with opportunities for indirect advertising/promotion (e.g., influencer marketing, online communities), is not limiting underage papulation from posting e-cigarette content on their accounts or limiting their search and follow for e-cigarette content and sales on the platform. There are clear shortcomings of the Instagram algorithm and its basic affordances to both users and marketers/advertisers. The current study's findings showed that some e-cigarette brands used automated reply strategies that failed to detect the age of the user approaching the brand/retailer. This is an information architecture, albeit complex, issue that needs attention from system designers to not only enable marketers and retailers of harmful products to select proper settings for their operations on their platform, but also to change the normative behaviors of businesses and brands on the platform in a way the advocates for protection of vulnerable populations. It also goes without saying that Instagram and other social media platforms should enforce age-gating for harmful products like e-cigarettes and leverage pattern detection capability of their algorithm to investigate and penalize violations of their community guidelines.

Finally, the current study's findings lend themselves to the importance of parental involvement and enhancing media literacy among youth and adolescents related to the dangers of engaging in communication and exposure to e-cigarette content via social media.

9.3 Limitations

This research is limited in different ways. First, the number of fictitious accounts was limited to six accounts only, thus our findings present a case-study-like description of the phenomenon subject to this study, and in way, can be taken as a means to generalize about all users on Instagram. And more accounts will provide more support to the generalizability of the study findings. Second, in the current study we relied on fictitious accounts that were created solely for the purpose of the current study; therefore, the findings cannot generalize to the complex context of individual use of Instagram. Third, the time for the experiment was limited to three weeks. Fourth, data gathering and analysis did not include newsfeed data that have been received to the fictitious accounts nor suggested accounts to the fictitious accounts users. Fifth, geographic location of operating the fictitious accounts was limited to one place, Lansing Michigan. Sixth, all the six fictitious account operated in one social media platform (i.e. Instagram) and from six iPads and used the same location and the same internet service account. Seventh, this study limited to communicating with e-cigarette retailer and brands accounts without making any purchase order or phone calls. These limitation were not avoidable and all have been expected during the research planning stage. Since we are dealing with a very limited research budget, timeline, and manpower under the current coved-19 epidemic times. Also, this work presented an individual work for a dissertation research. Nevertheless, with the given capacities this work is a fruitful and presented and outstanding research finding and novelty.

9.4 Future Research

Future research could duplicate this work with the following recommendations. First, increase the number of fictitious accounts age groups to thirteen. Where 8 accounts (2 (gender: male vs. female) x 2 (race: white vs. black) x 2 for repetition) presented each year from 13 up to 25 years old. Second, the time for posting could be six weeks for social content (memes) and two weeks for e-cigarette contents. Third, data gathering and analysis

should include news feed analysis and recommended accounts by Instagram Explore system. Fourth, future research could investigate other social media platforms like Facebook, Twitter, Snapchat, and TikTok. And use smart cellphone that is operated from different locations and different internet service accounts. Finally, I recommend future research design to cover the full funnel model capacities until making a purchase order from e-cigarette retailers and brands online. These elements will allowed the finding to be more generalizable and could presented more insights about the marketing and promotional strategies and practice of e-cigarette industry.

9.5 Policy Implications

This research suggests that e-cigarette brands and retailers are either not implementing, or are laxly implementing, age restrictions or age-gating systems (i.e. age verification system) on their Instagram content. Therefore, more should be done by e-cigarette brands and retailers, as well as Instagram policy to implement public health policy to counter the e-cigarette use among underage population. The policy implementation required very strong regulations and enforcement and monitor from law enforcement agencies. Perhaps another solution would be to require e-cigarette brands and retailers to also provide medical information and images about their products instead of only glamorized images.

CHAPTER 10

CONCLUSION

Under the pressure of declining market share of the smoked tobacco products the tobacco companies adapted e-cigarette (vaping) as a product replacement to regain the nicotine dependence market. This shifts required new marketing strategies including new channels of communication and distributions. While offline marketing and distribution channels is regulated under federal and state MLA laws and FDA regulations (U.S. Food and Drug Administration, 2018) the online marketing and distribution channels becoming a frontward for tobacco industry.

Social media became one of the most effective channels to promote e-cigarette among target populations. While adolescents and emerging adults have a high level of social media adaptation and use, understanding e-cigarette marketing activities and practices became critical for the public health researchers and community. Findings from this study showed that underage users of received exposed to e-cigarette content like adults in general. Underage users of Instagram are able to access content from e-cigarette retailers and brands through visiting the e-cigarette related accounts, received direct e-cigarette content through their newsfeed, searching for e-cigarette content through Explorer in Instagram, posting e-cigarette content on their accounts, following e-cigarette related hashtags successfully. Also, underage users through Instagram have the ability to directly communicate with e-cigarette retailer and brands accounts and received direct reply as a private message. Finally, underage users in Instagram have been reached out by e-cigarette retailers and brands through socially desirable behavior of engagement in the form of likes and comments on the underage users contents. While findings showed that e-cigarette accounts direct messages to underage Instagram users presented as an automated messages only but also provide a leading websites and social media links for e-cigarette purchase accounts.

The findings presented a clear evidence of advertising and promoting e-cigarette con-

tents to underage users in Instagram regardless of all guidelines and standers in the public health agencies regulations, online advertising guidelines, social media policies, and tobacco industry advertising framework. E-cigarette content, retailer, and brand accounts on social media should be countered with more restrict policy and implementation to protect underage populations.

APPENDICES

APPENDIX A

INSTAGRAM TERMINOLOGY DEFINITIONS

Table A.1: Instagram Terminology

Term in Instagram	Description or capacity in Instagram context
Post	It is a screening capacity of photo and video message with caption.
IGTV	It is a screening capacity that allows for extended time for the video post between one and ten minutes for each post.
Hashtag (#)	Used to identify a specific topic on social media. Usually done by having the "#" connected to topic or phrase or experience to facilitate the search and organization of similar content on social media.
Tag	Tag is to mention another Instagram user. Tagging used to notify a user, i.e. tagged user, about the post and to lead others, i.e. followers of the user.
@	Used to mention Instagram account address or username by adding @ before the account name
Mention	Mention takes a place when adding @ immediately before the username. Mention used to draw attention of another user to a content on Instagram that could be in the caption or in a comment. Mentioned user receive a notification the activity feed.
Like	To show your positive evaluation for a post content by double-tap on a post. Also, unlike for a liked post could be done by double-tap again on the post.
Follow	It is a feature that allows users, followers, to see when others they follow has any new post. Followers is the number users who follow a given Instagram account.
Comment	In each post there is a capacity for writing text and pictograph. i.e. emoji.
Direct message (DM)	It is two-way exclusive communication between two Instagram users.
Caption	It is a contextual written description as a part of the post.
Feed	It is a content that have been generated by other users based on a location on the application where people share content based on their preference. Feed has content from other account the user is following or content suggested by the application including advertising material.
Reply	It is a text message capacity for a comment on a post content.

APPENDIX B

PRETEST ANALYSIS

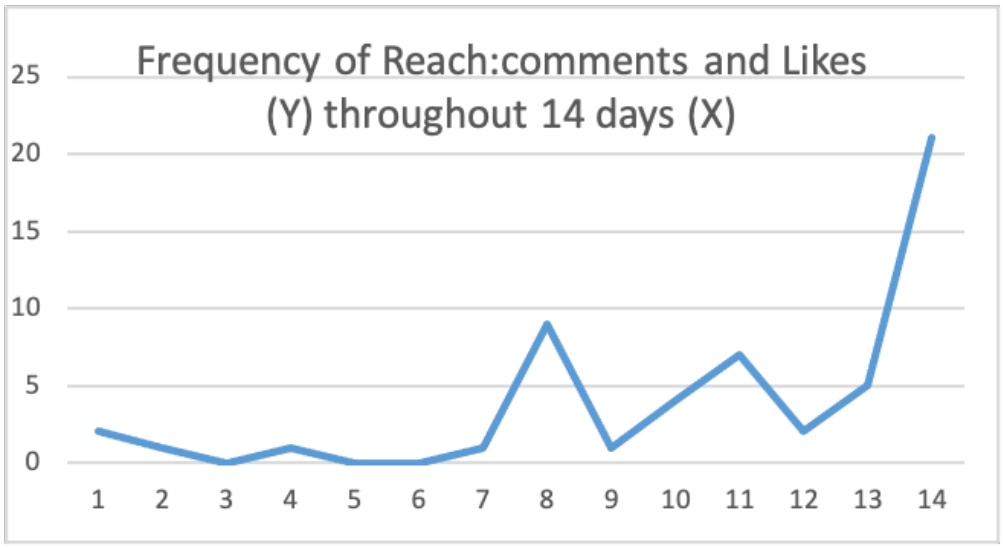

Figure B.1: Pretest Analysis for Frequency of Reach

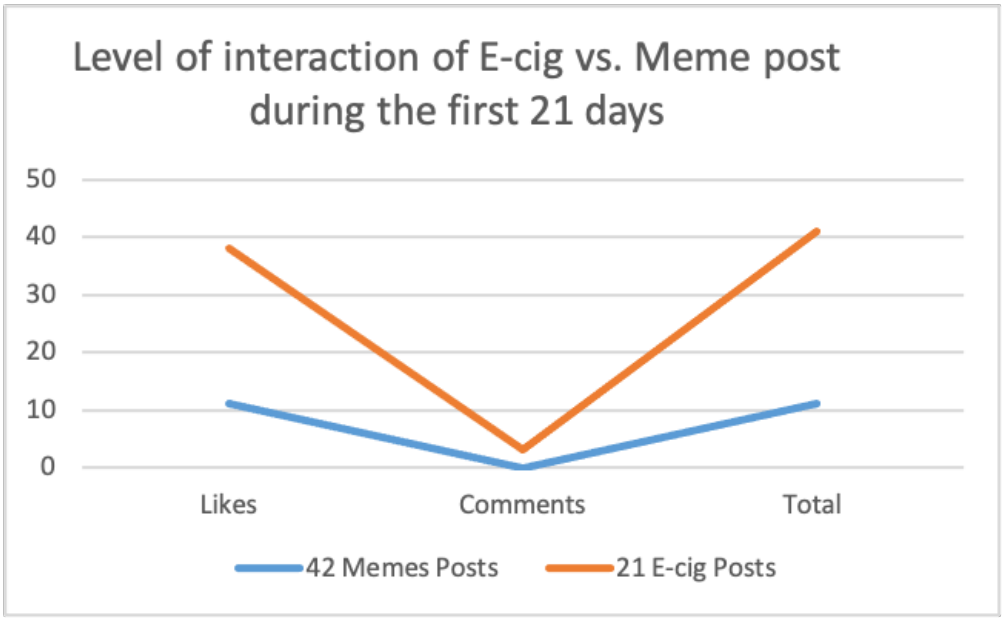

Figure B.2: Pretest Analysis for Interaction Level

APPENDIX C

INSTAGRAM ACCOUNT NAME LIST

Table C.1: Top Popular Male Names

#	Full name
1	Jacob Michael
2	Joshua Matthew
3	Daniel Christopher
4	Andrew Ethan
5	Joseph William
6	Anthony David
7	Alexander Nicholas
8	Ryan Tyler
9	James John
10	Jonathan Noah

Note: Top popular male names on the 2000s according to Social Security Administration list. `https://www.ssa.gov/oact/babynames/decades/names2000s.html`. Accessed on January 5th, 2019

APPENDIX D

FICTITIOUS INSTAGRAM INDIVIDUAL ACCOUNTS

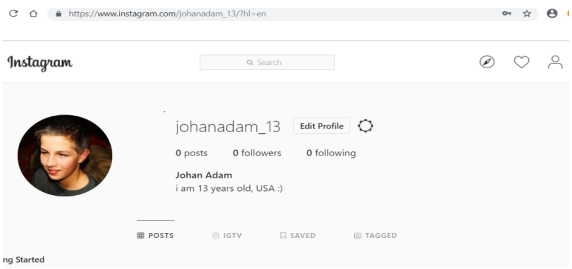

Figure D.1: Thirteen Years Old Fictitious Account

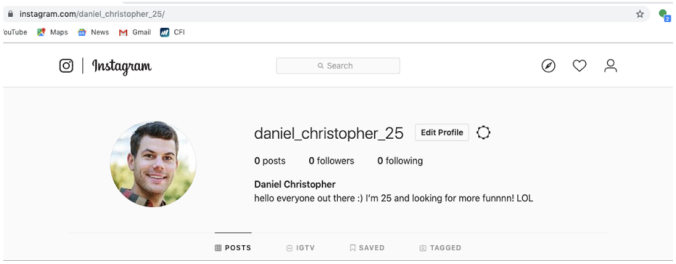

Figure D.2: Twenty Five Years Old Fictitious Account

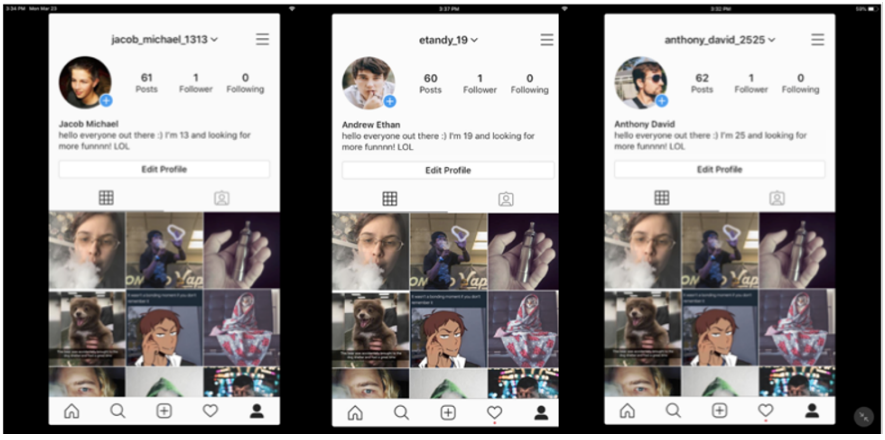

Figure D.3: Fictitious Accounts' Home Page

APPENDIX E

FICTITIOUS INSTAGRAM ACCOUNT SETTINGS

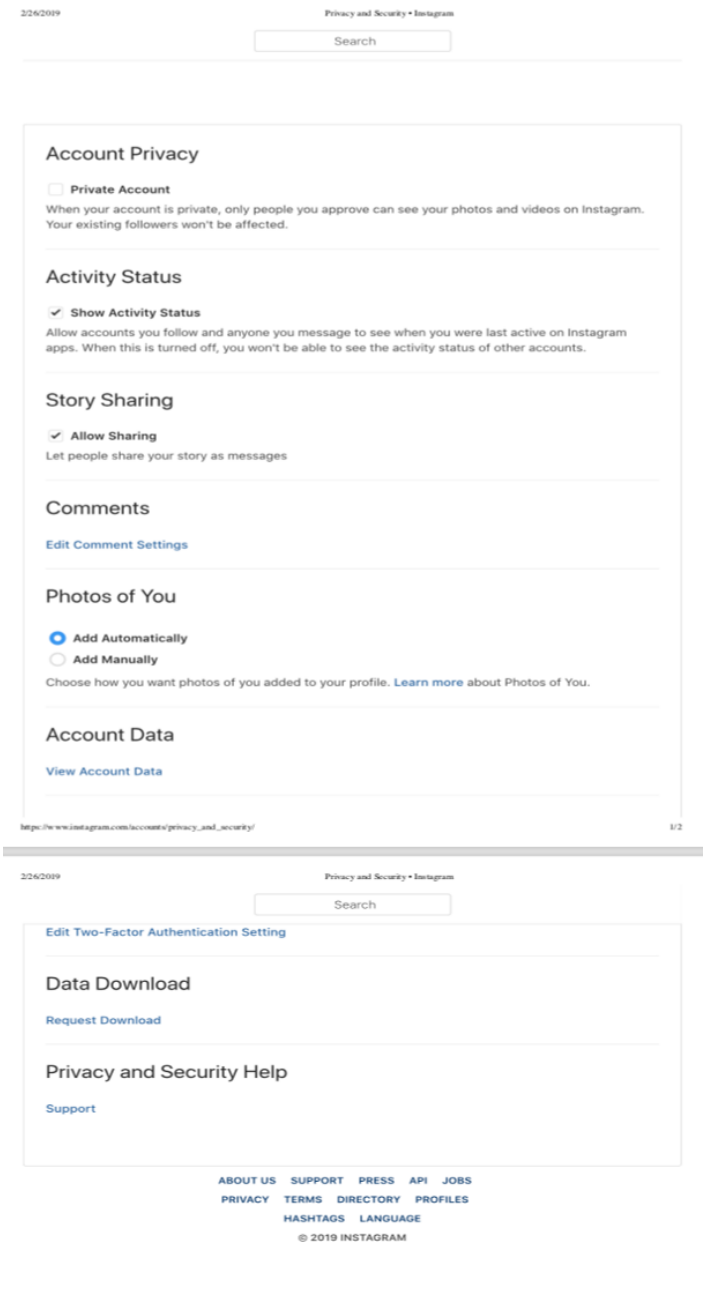

Figure E.1: Account Features

APPENDIX F

SOCIAL POSTING INSTRUCTIONS

First: Social posting condition applied from day 1 until the end of day 21 for the main experiment and for the pilot study social posts limited for week one and week two only the following fictitious accounts:

Table F.1: Fictitious Accounts Information

Account name	Account user ID in Instagram	Age of the account holder	Condition
Daniel Christopher	daniel_christopher25	25	Pilot study Reach
Alexander Nicholas	alexander_nicholas_13	13	Main study Post
Andrew Ethan	etandy_19	19	Main study Post
Anthony David	anthony_david_2525	25	Main study Post
Jacob Michael	jacob_michael_1313	13	Main study Reach
Ryan Tyler	Rynguy_19	19	Main study Reach
James John	james_john_25	25	Main study Reach

In day one of the experiment, all the six fictitious accounts will (1) follow hashtags #meme, #memes, #funny.

Table F.2: Hashtags' Posts Count

Hashtag	Number of current posts as of March 21th, 2019
#meme	Above 68 million posts
#memes	Above 78 million posts
#funny	Above 153 million posts

Below is the daily social content roster posts . The image number below for (2) main page posting with the corresponding four hashtags and (3) story uploading from day 1 to 21 of the experiment. The related images could be found based on the number below on the file name 63-meme images for experiments design.

Table F.3: Main Study Daily Social Content Roster Posts (Day 1 - Day 13).

Day	Img. No.	Hashtags in the caption of the post on the main page only
1	1	#memes #lol #meme #cat
	2	#memes #lol #meme #love
	3	#memes #lol #meme #face
2	4	#meme #haha #funny #cat
	5	#meme #haha #funny #baby
	6	#meme #haha #funny #instagood
3	7	#memesdaily #funnymeme #meme #oof
	8	#memesdaily #funnymeme #meme #goodlife
	9	#memesdaily #funnymeme #meme #kitten
4	10	#funnymemes #hilarious #meme #dog
	11	#funnymemes #hilarious #meme #1
	12	#funnymemes #hilarious #meme #dank
5	13	#dankmemes #funnyphoto #meme #Friday
	14	#dankmemes #funnyphoto #meme #explore
	15	#dankmemes #funnyphoto #meme #smurf
6	16	#meme #jokes #lol #oof
	17	#meme #jokes #lol #texting
	18	#meme #jokes #lol #haha
7	19	#meme #funny #lols #OMG
	20	#meme #funny #lols #RAWR
	21	#meme #funny #lols #friend
8	22	#memes #lol #meme #people
	23	#memes #lol #meme #1
	24	#memes #lol #meme #mycat
9	25	#meme #haha #funny #friends
	26	#meme #haha #funny #teacher
	27	#meme #haha #funny #mycow
10	28	#memesdaily #funnymeme #meme #picture
	29	#memesdaily #funnymeme #meme #gen
	30	#memesdaily #funnymeme #meme #kitten
11	31	#funnymemes #hilarious #meme #toilet
	32	#funnymemes #hilarious #meme #me
	33	#funnymemes #hilarious #meme #love
12	34	#dankmemes #funnyphoto #meme #pose
	35	#dankmemes #funnyphoto #meme #highfive
	36	#dankmemes #funnyphoto #meme #face
13	37	#meme #jokes #lol #madface
	38	#meme #jokes #lol #Monday
	39	#meme #jokes #lol #mymom

Table F.4: Main Study Daily Social Content Roster Posts (Day 14 - Day 21)

Day	Img. No.	Hashtags in the caption of the post on the main page only
14	40	#meme #funny #lols #mycat
	41	#meme #funny #lols #bonding
	42	#meme #funny #lols #babybear
15	43	#memes #lol #meme #2019
	44	#memes #lol #meme #mymorning
	45	#memes #lol #meme #myyogurt
16	46	#meme #haha #funny #cute
	47	#meme #haha #funny #notfish
	48	#meme #haha #funny #reader
17	49	#memesdaily #funnymeme #meme #oof
	50	#memesdaily #funnymeme #meme #ladies
	51	#memesdaily #funnymeme #meme #birdwatching
18	52	#funnymemes #hilarious #meme #mysister
	53	#funnymemes #hilarious #meme #me
	54	#funnymemes #hilarious #meme #adorable
19	55	#dankmemes #funnyphoto #meme #lion
	56	#dankmemes #funnyphoto #meme #agoodboy
	57	#dankmemes #funnyphoto #meme #affection
20	58	#meme #jokes #lol #catpose
	59	#meme #jokes #lol #myhead
	60	#meme #jokes #lol #me2019
21	61	#meme #funny #lols #idiot
	62	#meme #funny #lols #moods
	63	#meme #funny #lols #wingman

APPENDIX G

POST CONDITION

Week two: Post condition intervention

Second: the following fictitious accounts have been used under the post condition during the second week only:

Table G.1: Post Condition Accounts Information

Account name	Account user ID in Instagram	Age of the account holder
Jacob Michael	To be added when the account created	13
Joshua Matthew	To be added when the account created	19
Daniel Christopher	To be added when the account created	22

The image number for (1) main page posting with the corresponding seven hashtags and (2) story uploading from day 8th until day 14th of the experiment. The related images could be found based on the image number below on the file name 21_photos_of_e-cigarette.

Table G.2: E-cigarette posting condition for week two only

Day	Img. No.	Hashtags in the caption of the post on the main page only
8	1	#ecig #vape #vaping #ecigs #vapelife #vapingcommunity #girlswhovape
	2	#ecig #vape #vaping #ecigs #vapelife #vapingcommunity #vapingpen
	3	#ecig #vape #vaping #ecigs #vapelife #vapingcommunity #cloudvape
9	4	#ecig #vape #vaping #ecigs #vapelife #vapingcommunity #vapeshop
	5	#ecig #vape #vaping #ecigs #vapelife #vapingcommunity #vapelove
	6	#ecig #vape #vaping #ecigs #vapelife #vapingcommunity #vapedaily
10	7	#ecig #vape #vaping #ecigs #vapelife #vapingcommunity #vapeallday
	8	#ecig #vape #vaping #ecigs #vapelife #vapingcommunity #girlvaping
	9	#ecig #vape #vaping #ecigs #vapelife #vapingcommunity #vapefriend
11	10	#ecig #vape #vaping #ecigs #vapelife #vapingcommunity #vapemodels
	11	#ecig #vape #vaping #ecigs #vapelife #vapingcommunity #instavape
	12	#ecig #vape #vaping #ecigs #vapelife #vapingcommunity #vapeon
12	13	#ecig #vape #vaping #ecigs #vapelife #vapingcommunity #instavape
	14	#ecig #vape #vaping #ecigs #vapelife #vapingcommunity #squeeze
	15	#ecig #vape #vaping #ecigs #vapelife #vapingcommunity #vapenation
13	16	#ecig #vape #vaping #ecigs #vapelife #vapingcommunity #cloudvape
	17	#ecig #vape #vaping #ecigs #vapelife #vapingcommunity #vapelove
	18	#ecig #vape #vaping #ecigs #vapelife #vapingcommunity #clouds
14	19	#ecig #vape #vaping #ecigs #vapelife #vapingcommunity #vapinggood
	20	#ecig #vape #vaping #ecigs #vapelife #vapingcommunity #vapefam
	21	#ecig #vape #vaping #ecigs #vapelife #vapingcommunity #vapefamily

APPENDIX H

REACH CONDITION

Week two: Reach condition intervention

Third: the following fictitious accounts have been used under the reach condition during the second week only:

Table H.1: Reach Condition Accounts Information

Account name	Account user ID in Instagram	Age of the account holder
Andrew Ethan	To be added when the account created	13
Joseph William	To be added when the account created	19
Anthony David	To be added when the account created	22

The above fictitious three accounts will be used to do the following:

1. In day 8^{th} follow e-cigarettes hashtags list below (E-cigarettes Hashtags List).
2. In day 8^{th} follow e-cigarettes Instagram accounts list below (Followed E-cigarettes Instagram Accounts List).
3. Every day from day 8^{th} until the day 14th of the experiment will implement the reach condition daily roster (Reach Condition Daily Roster: for like, comment, and direction message content). The experiment conductor (i.e. the research assistance) will go through each fictitious account main feed and for the third, sixth, and ninth e-cigarette post from the followed e-cigarette accounts (Followed E-cigarettes Instagram Accounts List) will do:

    a) Like
    b) Comment
    c) Direct message

4. In day 14^{th} unfollow the e-cigarette hashtags list in step (1) and unfollow the e-cigarette accounts list in step (2).

Table H.2: E-cigarettes Hashtags List

Hashtag	Number of current posts	Baseline for e-cigarette hashtag
#vape	Above 25 million posts	Popular with consumer and industry posts
#vapelife	Above 15 million posts	Popular with consumer and community posts
#cloudchaser	Above 4 million posts	Popular with consumer liked posts
#vapeporn	Above 11 million posts	Popular with consumer liked posts
#ecig	Above 3 million posts	Popular with industry posts
#vapers	Above 15 million posts	Popular with industry liked posts
#vaping	Above 8 million posts	Popular with consumer and industry posts
#ejuice	Above 5.8 million posts	Popular with consumer and industry posts
#eliquid	Above 5 million posts	Popular with industry posts
#vapeshop	Above 3 million posts	Popular with industry posts

$*$ data retrieved on March 21, 2019 from on Instagram.com and the following website for hashtags evaluation `http://best-hashtags.com/hashtag/meme/`

Table H.3: Followed Instagram Accounts

Followed E-cigarette Instagram Accounts List- in Instagram as of March 20, 2019*										
#	Account name	Number of Posts	Number of followers	Coded as e-cigarette retailer (R) or brand (B) or others (OTHER) based on the account content	Acc. Type based on the bio and N give to account with not specific mentioned type	Number of Social media links	Number of URL links and emails	Sales or sponsor content in the profile (Y,N)	Any MLA variation (Y,N)	Location (specific , N)
1.	vapor4life_official	603	2668	R	N	3	2	Y	N	N
2.	Officialvgod	7444	576k	B	Product/services	1	1	Y	Y	California
3.	Vaporlogicatx	578	6992	R	N	1	2	Y	N	TEXAS
4.	vapingseries	772	96.2k	R	Product/services	0	1	Y	N	N
5.	Vape_wold	122	16.7k	R	N	0	1	Y	N	N
6.	Complyfe_tcl	2840	70.6k	R	Shopping & retail	1	1	Y	Y	Georgia
7.	Voopootechofficial	2317	286k	R	Electronics	0	2	Y	N	N
8.	avidlyfeinc	1124	42.8k	B	company	0	2	Y	N	California
9.	Drip.gram	1578	118k	R	Media/news company	0	2	Y	N	N
10.	Savage.enterprises	1705	321k	R	business	0	2	Y	Y	N
11.	purehempshop	799	36.6k	B	Health and beauty	0	2	Y	N	California
12.	Snowwolf	1973	117k	B	Product/services	1	2	Y	N	USA
13.	freemaxvape	1077	37.6k	B	e-cigarette store	1	2	Y	Y	N
14.	vaperona	420	44.5k	B	Shopping & retail	2	2	Y	N	Worldwide
15.	eleafglobal	2578	140k	B	Electronics	0	2	Y	N	N
16.	vapesale	5951	213k	B	Product/services	0	2	Y	N	N
17.	Illusionsvapor	167	17.1K	R	N	0	2	Y	Y	Worldwide
18.	Vapemadhatter	181	63.9K	R	COMPANY	2	2	Y	Y	California
19.	taffy_man	107	13.9k	B	N	0	2	Y	N	N
20.	528_custom	4024	179k	B	N	0	2	Y	Y	N

∗I selected the list below based on #vape posts in Instagram. Accounts that have mentioned based on the bio to be located outside the USA have been avoided. Also, any individual account with less than 100 posts and 1,000 followers has been avoided.

Table H.4: Reach Condition Daily Roste

Reach Condition Daily Roster: for like, comment, and direction message content.				
Day	Action number	Like	Comment	Send direct message
8	1		I love to ☺	How do I get a vape?
	2		Nice shot and beautiful gallery	What is the least expensive vape you carry? it expensive?
	3		You guys are so lucky	What juice got you thc clouds!!!
9	1		This shot is so soulful ... dope!	awesome stuff what is your new vape out there?
	2		Holey everything about this is nice ☺	You got free coupons for vapes and flavored juices
	3		Great shot famo 👊👊	I love fruity juice which ones you suggest?
10	1		Awesome awesome awesome shot	Hello what is new out there...
	2		I really like the product, if you send me a gift?	What vapes you carry now?
	3		Nice post! I've been dying to try this flavor□ ❤️❤️	OMG all what you have niceee, what is your new vaping?
11	1		✅I love this post💪	Awesome clouds ☺ what high-tech stuff you have?
	2		Wow!! Sounds tastier than the last.... 😍😍😍😍 I gotta try em all ❤️□□ ❤️	Orange tangerines really great bodied flavour. Let me know what got 🔥
	3		☺🙌🙌🙌🙌	Cool pod 💪 what you got discounted
12	1		❤️❤️❤️Sick !!	cheers!!! Gonna wait for ur next post! Big thing ;)
	2		✅Very interesting☺	🌬🌬🌬🌬🔥 😍😍😍😍 !!!
	3		Always wanted to try that!	Pass me some of you freees ❤️🌬 what vapes you carry?
13	1		Class and style for dayzzzz	What specials do you have out??
	2		Greta line... Truthfully, your page is extraordinary, I am happy to follow your journey.	You have some great shots in your gallery! I mean I liked them ☺
	3		Live it!	I need coooool pods what you got?
14	1		thank you very much :p Great stuff 👊	I wanna coupons for vape and juice?
	2		hmmm I wonder how that would taste	You have one of the good galleries I've seen today 🤘
	3		So cool ❤️	Great stuff out there 😍 what vape do you recommend?

Fourth: in day 21 of the experiment all the six fictitious accounts with unfollow the hashtags #meme , #memes , #funny.

APPENDIX I

CODE BOOK FOR DATA ANALYTIC PLAN

Table I.1: Account Home Page Data Code Book

Account general information:
Fictitious account name
The experiment design week number: (from 1 to 3)
Frequency of reaching to the account contents:(0 - the counted number)
Number of tags:
Number of likes:
Number of posts:
Number of liked posts:
Number of liked comments:
Number of comments on the account posts:
Number of followers:
Number of unfollow:
Number of relay to comments made by the user:

Table I.2: Instagram Retrieved Data Code Book

Retrieved Data	Matched the planned for in the experiment design (Y, N)
Profile information	
Posted photos	
Uploaded story	
Comments made	
Followed hashtags	
Followed accounts	
Unfollowed hashtags	
Unfollowed accounts	

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