**Applying the T.A.R.E.S. Framework to Examine Digital Natives and Their Perceptions of the Ethicality Regarding Direct-to-Consumer Pharmaceutical Advertisements on Digital Platforms**

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**Abstract**

This study applies Baker and Martinson’s (2001) T.A.R.E.S. framework to determine to what extent are the five principles of the T.A.R.E.S. framework evident in DTCPA as perceived by digital natives. A qualitative research design was employed, and 12 participants who are currently enrolled in a college or university program, have access to technology, and are frequent users of social media were purposively sampled. The data was collected through depth interviews conducted both virtually on Zoom and in person at Norlin Libraries on The University of Colorado, Boulder’s campus. The results suggest that digital natives do not find any of the T.A.R.E.S. principles evident and perceive DTCPA to be unethical as ground into the following themes: *Truthfulness is contextual, Profits serve as a barrier to authenticity, Power imbalance between messenger and receiver contributes to lack of equity, Deceptiveness Compromises Social Responsibility*, and *Concern for future generations.* The findings of this study provide insights, perceptions, and recommendations for all T.A.R.E.S. principles to be present in ethical DTCPA from a digital native's perspective.

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**Introduction**

Advertising ethics has been a highly debated topic in the strategic communication field (Snyder 2016; Marshall, 2022). Many practitioners struggle to navigate through conflicts of interest by differentiating client needs from the overall well-being of the public (PR News, 2005). New technologies and platforms are being developed and distributed for the public to use at their discretion, enabling industry 4.0 to continue to advance (André, 2019; Lopes & Oliveira, 2022). The increase in development of digital technologies has allowed an influx of pharmaceutical advertisements to appear on newly developed media platforms frequented daily by young generations, later in this paper referred to as digital natives (Bohari, Ghani, and Alias, 2022).

This research study examines the current ethical parameters guiding direct-to-consumer pharmaceutical advertising through social media platforms, specifically to understand the impact of persuasive advertising strategies on digital natives through social media. To explore digital natives’ perceptions of persuasive advertising tactics used on social media channels.

Secondary research has been conducted to gain a deeper understanding of the prior research and knowledge acquired regarding persuasive advertising tactics through direct-to-consumer advertising of pharmaceuticals on social media platforms to date. These topics include information regarding DTCPA’s evolution, adoption, and current state, calling special attention to social media and digital natives as a primary audience through the ethical lens of Baker and Martinson’s (2001) T.A.R.E.S. framework (Arnold & Oakley, 2013; Baker & Martinson, 2001; Makowska, 2016; Auton, 2004; Hoek et al., 2004; Shaheen, 2022; Lancet, 2002; Gardner et al., 2003; Jae & DelVecchio, 2022; Wilson & Till, 2007; Fotis et al., 2011; Mangold & Faulds, 2009).

**Literature Review**

**The Evolution of DTCPA in the US**

DTCPA is a new form of advertising in the pharmaceutical sales industry. The adoption of new advertising strategies dates back to the early 1990s (Makowska, 2016). The FDA change in 1997 was the cause of the DTCA we now see today (Auton, 2004). With the implementation of new advertising strategies and the rapid development of technology, other nations have expressed many concerns regarding the ethics of DTCPA (Hoek et al., 2004). Therefore, the United States of America and New Zealand are the only two nations to permit DTCPA to this day (Hoek et al., 2004; Shaheen, 2022). During the fall of 2004, the Chief Counsel of the FDA, Daniel Troy, established a group to develop guiding documents to govern the FDA’s regulation of commercial promotional communications (Library of Congress, 2004, p. 23). Since this, many more revisions and steps have been taken to further reform the guiding ethical and legal parameters for direct-to-consumer pharmaceutical advertising (Applequist, 2016).

**Adoption of DTCPA in Other Countries**

The decision to begin implementing DTCPA in The United States and New Zealand set a precedent for conversations amongst other nations to consider embracing this persuasion technique for alternate health literacy (Lancet, 2002; Gardner et al., 2003). Disease state awareness advertising has begun to emerge in other countries in the USA and New Zealand’s footsteps (Lancet, 2002; Gardner et al., 2003). Many countries still hesitate to engage in DTCPA. In 2002 concerns were raised and now are being raised again with the potential legalization of DTCPA in Europe (Jessop, 2011). One limitation to categorizing the United States and New Zealand as nations under the same umbrella is that DTCPA is legalized in the US and New Zealand, the nations have differing policies (Norey et al., 2008). The US spends far more on pharmaceuticals than New Zealand (Norey et al., 2008). In 2016, the industry spent upwards of $6 billion on direct-to-consumer advertisements (Morrison, 2023). Although it may seem foreign, similar technologies had existed in place previously (West, 2012). Searching for information regarding health concerns is a widespread practice (West, 2012). Therefore, direct-to-consumer advertising has always existed in some form (Webb, 2005).

**Ethics of DTCPA**

To remain ethical in DTCPA, pharmaceutical companies must ensure that the consumer is fully informed about the drug (Jae & DelVecchio, 2022). When segmenting DTCPA media consumers, it is crucial to recognize the challenges surrounding vulnerable populations (Mukherji, 2017). These consumers require a careful analysis of pharmaceutical messaging before dissemination. Vulnerable populations include but are not limited to minorities not fluent in English, people with cognitive disabilities, and very young as well as old consumers who may have trouble understanding complex information presented for traditional audiences (Mukherji, 2017). Particularly vulnerable populations with low levels of health literacy already have several barriers inhibiting their ability to fully comprehend all of the drug information (Mukherji, 2017). Vulnerable populations are at a disadvantage when understanding health literacy and analyzing how risk information is often unethically presented to vulnerable populations. (Jay & DelVecchio 2021). Solutions to improving vulnerable populations’ health literacy include implementing a bullet point list to make detailed information more easily understandable (Jay & DelVecchio, 2021). Vulnerable populations are particularly susceptible to advertisements on social media platforms (De Scisciolo, 2018). In DTCPA, it is to be assumed that consumers do not have enough health literacy to filter promotional claims about prescription drugs that pressured physicians will prescribe (Reeves, 1998). Furthermore, the impact of the FDA’s recommendation is to enhance motivational value when advertising to minorities (De Scisciolo, 2018).

Consumers’ knowledge of prescription drugs from direct-to-consumer pharmaceutical advertising has an impact on their level of trust in the drug (Mukherji, Janakiraman, Dutta, & Rajiv, 2017). Causation is found between the level of self-involvement in one’s personal healthcare and positive/negative attitudes towards DTC’s persuasion efforts (Wilson & Till, 2007). The higher involvement an individual has in their specific healthcare needs causes an increase in positive attitudes towards DTC advertising; this then results in the individual acting on the call to action in pursuing a prescription drug seen through DTCA (Wilson & Till, 2007). However, effective persuasion is lost in DTCPA when individuals feel they do not have enough and need to be armed with more knowledge about the drug to make an informed decision about their health. Patients responded in a survey that they feel they need to be better informed from DTCPA advertisements (PR Newswire, 2021).

Unethical price disclosures have had a history of several occurrences in DTCPA. In direct-to-consumer advertising, dermatology products and services have a high level of occurrences. These often accumulate to become a recurring expense only disclosed after the consumer possesses the drug (Korman & Fabbro, 2021). Although the ethicality of price disclosures in DTCA may be murky, price transparency has shown no effect on consumer behavior (Hollin & Ball, 2022). An effective strategy to reduce consumers’ interest in high-priced drugs is to mandate that pharmaceutical companies disclose prices in DTCPA (Garrett et al., 2019).

With the growth of social media, pharmaceutical companies are also beginning to leverage this. An article featured in Vox described the value of patients to pharmaceutical marketers in establishing their brands on emerging digital platforms (Zuppello, 2019). Pharmaceutical companies are beginning to opt for smaller influencers with more segmented audiences who are more likely to accept health messaging to use as advertising devices through social media platforms (Wills & Marjorie, 2022).

**Social Media Advertising**

Social media has altered consumer behavior regarding awareness, information acquisition, opinions, attitudes, and purchase/post-purchase communications and evaluation (Fotis et al., 2011; Mangold & Faulds, 2009). Acquisition of information is the most influential element contributing to social media’s ability to alter consumer behavior. (Fotis et al., 2011; Chung and Buhalis, 2008). Media consumers in the United States prefer consumer reviews and user-generated videos (Fotis et al., 2011).

Advertisers of all industries are increasingly using persuasive tactics on social media platforms (Ridout, 2011). Direct-to-consumer pharmaceutical companies are following closely behind in the footsteps of other companies; however, due to the interconnected nature of health literacy, ethical questions are raised about DTCPA’s persuasion tactics through new mediums such as social media platforms (Armstrong, 2010). As consumers continue to consume media and information throughout their daily lives, they are now susceptible to around-the-clock advertisements at their fingertips. Each social media platform has unique ways of integrating ads into the content (Wei et al., 2021). The effectiveness of creating native advertising unique to individual social media platforms directly affects the messages’ persuasive nature amongst consumers (Wei et al., 2021). The persuasive nature of DTCA on social media platforms has proven effective. From 2012 to 2020, companies had a 64% increase in sales across nine years. In 2012, an estimated 3.9 billion in revenue was generated; this number leaped to 6.58 billion in 2020 (Guttmann, 2022). DTCA’s proven effectiveness has evoked positive change in consumers’ level of engagement with their personal health. Health improvements have been found in a survey revealing that 35% of adults discussed DTCPA with their physicians, leading to a 22% increase in patients discovering a new diagnosis (Langdorf, 2016).

As mentioned, to be effective in persuasive DTCA, advertisers strategically cater the messaging to fit natively within each unique social media platform (Wei et al., 2021). A strategy initially explored for the purpose of political campaign persuasive advertising is the use of humor (Aytuna & Capraz, 2021). For many social media platforms, humor is a foundational aspect of the content that inhabits the space within the platform, proving this to be an effective use of persuasion for DTCA (Willis & Delebrare, 2022). A strategy currently used today in DTCPA is emphasizing persuasion through the credibility of opinion leaders. Pharmaceutical companies are using influencers as an advertising strategy for pharmaceutical drugs (Willis & Delebrare, 2022). Using influencers effectively integrates DTCPA’s messaging into the platforms by mimicking the usual non-health related product promotion influencers are often used for as a strategic means of gaining earned and shared media (Zhang & Hamari, 2020). DTCPA advertisements are projected to continue to become increasingly popular and persuasive as the technology and advertising industries continue to develop and advance (Zhang & Hamari, 2020). The persuasive nature of social media has become increasingly influential as the mobility of advertisements increases (Zhang & Hamari, 2020).

Native advertising also referred to as organic advertising is paid media content integrated into the platform’s format, including user engagement features such as search ads, promoted and suggested posts, and other active consumer participation features (Matteo & Zotto, 2015; Lee et al., 2016). Native advertising produces higher acceptance resulting in increased profits, positive brand outcomes, and effective dissemination of relevant information (Kim, 2017).

**Digital Natives**

The term “digital native,” coined by Marc Prensky in 2001, refers to the generation born during the tail end of the twentieth century and into the twenty-first century during or post-information age. Digital native’s first encounter with technology began at a young age, raised in a society centered around the development and implementation of new technologies (Armagan, 2013; Cohen, Prayag, & Moital, 2014; Sert, 2020), a world existing in the absence of technologies such as the internet, cell phones, and computers is a foreign concept to this cohort (Monaghan et al., 2019). We cannot apply outdated frameworks to guide DTCPA’s ethics on emerging platforms that Digital Natives occupy because, along with the evolution of technology came the evolution of society and the generational shift that includes significant changes in attitudes and approaches to learning (Jones & Thomas, 2011; Tapscott, 1990; Tapscott, 2009). Furthermore, the new generation thinks differently; the brains are different from previous generations, caused by the process of technology’s change (Prensky, 2001; Jones, 2011). In a 2015 study conducted by Claridge found that society’s assumption that digital natives can search and obtain information effectively has proven to be a detrimental misconception through a qualitative research study using Think-Aloud protocols as a framework for observing students’ information-seeking behaviors. This study found that interviewees were confident in their ability to use technology; however, they demonstrated a lack of adequate search skills and discernment (Claridge, 2015). Social media’s impact on all aspects of life affects more digital natives open to virtual structuring and innovations, incorporating emerging technologies into their daily routines and changes outside the traditional areas (Sert, 2020, p. 552).

**Theory**

This study applies Baker and Martinson’s (2001) T.A.R.E.S. ethical framework to determine to what extent are the five principles of the T.A.R.E.S. framework evident in DTCPA through the eyes of the message receiver. This study used the T.A.R.E.S. test to serve as a theoretical framework for evaluating ethical persuasion in direct-to-consumer pharmaceutical advertising. The T.A.R.E.S. test created by Baker and Martinson in 2001 consists of 5 guiding principles: TRUTHFULNESS of the message, AUTHENTICITY of the persuader, RESPECT for the persuadee, EQUITY of the appeal, and SOCIAL RESPONSIBILITY for the common good. For the purpose of this study, the perspective of the communicator acts as the pharmaceutical advertiser. As a theoretical model for ethical persuasion, the T.A.R.E.S. test has five guiding principles for determining ethical persuasion. Each principle looks to a unique element of the persuasion act from the communicator’s perspective (Baker & Martinson, 2001).

The truthfulness of the message is the first guiding principle that acts as the foundation for persuasive messaging that regard audience deception as a form of harm (Baker & Martinson, 2001; Bok, 1989). Moral reflection is required before disseminating any potentially harmful messages; examples of questions professional persuasive communicators might ask themselves while determining the truthfulness of the message can be found in Baker and Martinson, 2001 on page 161. Truthfulness in the T.A.R.E.S. test highlights deception as a pivotal factor when determining ethicality of the message. Deception causes harm to society, trust is a priceless social good, and when deception occurs, undue harm to society follows (Baker & Martinson, 2001; Bok, 1989). Truthfulness requires the intention of the message to provide others with the truthful information required to make educated decisions affecting everyday life.

Authenticity regards the authenticity of the persuader. The T.A.R.E.S. test defines authenticity for persuasive communication by breaking it into three categories:1. Integrity and Personal Virtue, 2. Sincerity and Genuineness, and 3. Loyalty and Independence (Baker & Martinson, 2001, p. 162). Integrity and personal virtue focus on the communicator’s personal motivators, emotions, past experiences, and subconscious biases. Sincerity and genuineness explain the communicator’s personal level of belief in the benefits of the product through truth, respect, responsibility, equitability, and fairness. Loyalty and independence highlight potential conflict areas to ensure loyalties are appropriately balanced (Baker & Martinson, 2001). Actions shape our authenticity (Golumb, 1995 & Baker & Martinson, 2001).

Respect for the persuadee is the root motivation for the other T.A.R.E.S. principles. “Persuaders should disseminate truthful messages through equitable appeals with integrity and authenticity and with an eye to the common good because of their respect for the people to whom they are communicating and for all others who will be affected by the persuasion” (Baker & Martinson, 2001, p. 163). Respect requires communicators to regard consumers of persuasive messaging as worthy of dignity. It mandates that they do not violate consumers’ rights and interests and that they do not prioritize the self-interest of client-serving purposes. It assumes that no professional persuasion effort is justified if it demonstrates disrespect for those it is directed (Baker & Martinson, 2001; Jaksa & Pritchard, 1994; Christians, 1997).

Equity of the persuasive appeal calls for the consideration of the content and execution of the persuasive communication to make sure it is fair and equitable. This principle helps to determine whether communicators have fairly and ethically used communication persuasion tactics in the advertisement. Equity in the T.A.R.E.S. test highlights power imbalance in the messenger receiver relationship and requires that message has fairly used the power persuasion in a given situation. Messaging cannot be made beyond the receiver’s ability to understand both the context and underlying motivations and claims. This principle emphasizes the importance of similarity between the communicator and the message receiver in understanding information, insight, capacity, and experience to ensure all audiences are not being unfairly and unethically exploited. Equity calls particular attention to the fact that "vulnerable audiences must not be unfairly targeted" (Baker & Martinson, 2001, p. 166). This emphasizes the importance of the audience’s level of health literacy, as well as the target audiences’ access to the message. Practitioners can evaluate the equity of the persuasive appeal in greater depth by comparing the message to Rawls’s (1971) “veil of ignorance” and Bok’s application of “the golden rule” (1995).

Social Responsibility for the Common Good focuses on the need for communicators to consider the public’s common goals and interests, prioritizing the community interests over self or client-based interest and profit. Persuasive communicators that align with this fourth guiding principle avoid the proportion of products, goods, and services that are harmful to the community and do not serve the common good. The heart of social responsibility in the T.A.R.E.S. test builds from a prior principle, respect, as social responsibility calls into question the respect for individuals and society as a whole entity (Jaksa & Pritchard, 1994).

According to Baker and Martinson (2001), persuasive communication professions, such as public relations and advertising, are prone to conflicting interests as they prioritize serving the needs and desires of their clients and themselves. However, Baker and Martinson (2001) also acknowledge that the T.A.R.E.S. test’s five guiding principles can provide moral safeguards to counterbalance the potential harm caused by persuasive messages created and distributed by communication practitioners.

Based on the discussion, this study asks to what extent are the five principles of the T.A.R.E.S. framework evident in DTCPA? This question allows for a better understanding of the interviewee’s perception of ethicality in DTCPA using the framework as a guide for interview questions and understanding coded data. The T.A.R.E.S. test serves as an instrument to evaluate the ethicality of a message in an advertisement, as this highlights specific criteria for the interviewees and coder to assess the content and decipher weather, they believe ethicality is or is not exhibited in the DTCPA message. The questions asked during the interviews were geared to probe and assess if interviewee believes each principle of T.A.R.E.S. is present in current DTCPA and to what extent.

**Method**

To address the research question, this study interviewed 12 digital natives in this qualitative study. Qualitative research method was selected as depth interviews are particularly beneficial to help understand the data collector understand participants perspectives, behaviors, beliefs and justifications (Berger, 1998; Lee, 2004). A benefit to qualitative research is the flexibility it provides to the researcher during the analysis of data (Morrison et al., 2012). The flexibility a useful factor leveraged in this study as IRB approval was received on March 7, 2023, the participant recruitment process began, and interviews were conducted between March 8th to March 27th, 2023.

To recruit participants for the study, a purposive sampling method is employed, which involves a defined set of criteria requiring participants to be currently enrolled in a college or university program, have access to technology, and are frequent users of social media, and aimed to increase the suitability of participants for the study, often used in qualitative research (Pyrczak, 2016; Morrison et al., 2012). Participants were recruited through an IRB approved informational flyer posted on bulletin boards around the University of Colorado, Boulder, in the Boulder community as well as on social media platforms. To prevent undue influence while recruiting participants, the recruitment flyers feature essential information, and contact details for interested individuals to participate at their convenience.

This population was selected as participants because college students represent a demographic that removes a significant differentiating factor in society – their educational background (Hargittai, 2010). University students generally have a high level of network connectivity and access to resources. As the digitally aware generation emerges, this is a societal group in which it has been assumed that the effects of change due to the technological developments will be most evident (Oblinger & Oblinger, 2005; Jones, 2011). This cohort contains individuals who have grown up during the initial development of social media. Spending their adolescent years on new devices and platforms. Interviewees referred to as ‘Digital Natives’ are defined as individuals born after 1980 who were raised in an environment in which they were surrounded by technology and consists of people who possess technological skills different from those possessed by the members of the prior generations (Palfrey & Gasser, 2013; Prensky, 2001). This segmented population has been and continues to be a generation of experimentation with pharmaceutical drugs, advertising techniques, technological advances, and the creation of social media platforms.

Prior to the interviews, all participants were requested to sign an informed consent form. The participants’ identities were kept confidential, and all identifiable information was discarded immediately after coding the transcriptions. In this study a total of 12 in-depth, one-on-one interviews were conducted in Norlin Library study rooms and on Zoom. Upon the completion of the 12th interview, theoretical saturation was achieved both in the participants data as a sufficient amount of data to achieve theoretical saturation (Guest et al., 2006; Morrison et al., 2012). During the interviews, participants were asked to verbally answer questions pertaining to their online media usage, perceptions, and opinions regarding their personal encounters and experiences consuming direct-to-consumer pharmaceutical advertisements. The average duration of interviews took 30 minutes. Upon interview completion, the transcriptions were systematically coded and analyzed using Baker and Martinson’s (2001) T.A.R.E.S. framework. The coding process began with open coding to group raw data into conceptual categories to find initial emerging themes from the raw data collected (Khandkar, 2009). The data was then coded two more times using axial coding as needed to draw relationships between concepts and categories from open coding (Strauss & Corbin, 1990; Kaiser & Presmeg, 2019) and finally selective coding to group data into common themes that answer the research question (Kaiser & Presmeg, 2019; Teppo, 2015).

The 12 interviewees were:

* Interviewee I, 21 years old, Female, The University of Arizona
* Interviewee J, 21 years old, Female, The University of Kansas
* Interviewee K, 22 years old, Female, The University Colorado, Boulder
* Interviewee L, 22 years old, Male, The University of Colorado, Boulder
* Interviewee Z, 21 years old, Male, The University of Colorado, Boulder
* Interviewee M, 21 years old, Female, Colorado State University
* Interviewee N, 21 years old, Female, The University of Colorado, Boulder
* Interviewee O, 23 years old, Female, Colorado State University
* Interviewee P, 22 years old, Female, Creighton University
* Interviewee Q, 19 years old, Female, Colorado State University
* Interviewee R, 23 years old, Male, The University of Colorado, Boulder
* Interviewee S, 21 years old, Female, San Diego State University

The following section addresses the findings of this study.

**Findings**

The RQ, to what extent are the five principles of the T.A.R.E.S. framework evident in DTCPA, was examined and answered using the T.A.R.E.S. framework to determine whether participants perceived their personal encounters with DTCPA. The data was coded and grouped into each category as it applied to determine user experience of the message ethicality. Thematic frames for each T.A.R.E.S. principle serve as a broad categorical grouping method, which allow the coder to understand message meaning and decipher ethical meanings from respondent data within each emerging theme. This study employed the five principles of the T.A.R.E.S. model as a means of evaluating qualitative data collected in formal in-depth interviews with participants.

The 12 participants interviewed were between the ages of 19 to 23 years old. The participants in this study attend various universities across the United States as undergraduate students perusing BA. These participants were obtained through IRB approved recruitment material posted to social media platforms and interviewed virtually. The participants recruited locally responded to bulletin board approved flyers posted around the Boulder, CO community. These participants were interviewed in person in a private study room at Norlin Library on the University of Colorado, Boulder, main campus.

To make sense of the user experience viewing DTCPA from a digital native’s perspective, the conducted depth interviews provided insights, perceptions, and recommendations for direct-to-consumer pharmaceutical advertisements. Encounters with direct-to-consumer pharmaceutical advertisements occur daily for the interviewed participants. Interviewees feel strongly that the nature of DTCPA is unethical. Redundancy was found in themes of being “forced” to view “misleading” advertisements that promote “self-diagnosis” emerged in all twelve interviews. The results revealed that ads suggesting symptoms, diagnoses, and solutions to the viewer have greater associations with low message ethicality than those with strictly messaging about the drug. To ground the data, the information has been coded using the T.A.R.E.S. test as a guiding theory, the five following themes emerged.

**Truthfulness is contextual**

Truthfulness within DTCPA constitutes the validity of the communicators message. Interviewees found truthfulness as a leading principle of importance required for ethical DTCPA. Eleven out of the twelve interviewees ranked the importance of truthfulness as a top two principle out of the five as a means to achieve ethical DTCPA. When asked about their perception of truthfulness in current DTCPA, redundancy was found through repetition of words similar to “deception” “falsehood” and “misleading”. Interviewee Z used the term “false narrative” to refer to unanimously shared feelings that DTCPA messaging fails to meet the nature of truthfulness. Deception was found overtly (Bok 1989) through the advocacy of entertainment opinion leaders over professionals, and lack of information disclosed in the advertisement messaging.

Interviewee S explains the power of persuasion an opinion leader that resonates with its target audience:

“The ads are usually pretty captivating too like a micro influencer will make an ad for ADHD medicine” – *Interviewee S*

Interviewee S stresses the unethical nature of employing a trusted opinion leader as a persuasion tactic.

“There’s no need for an influencer to be advertising a prescription drug to me on Tik Tok” – *Interviewee S*

Digital natives reported high levels of information seeking when making decisions at the macro level in their daily lives as well as at the micro level when making decisions about personal health. Interviewee S stated,

“I feel like not only are they not giving me enough information about the drug but also diagnosing me at the same time” – *Interviewee S*

Interviewees stressed direct-to-consumer pharmaceutical advertisement communication is incomplete and does not satisfy a reasonable person’s requirements for information (Klaidman & Beauchamp, 1987). Interviewee J depicts the “harm” caused as a result due to lack of information,

“I think, yeah, just more information in general, because I think right now, most ads, and most students only see and perceive these ads in one way, which is, oh, I can get on this pill, and I’ll be an A plus student are all be super productive. When in reality, they know nothing else, besides those two lines that they’ve heard or seen from an ad.” – *Interviewee J*

A conclusion drawn from this data is that truthfulness is not evident in current DTCPA. Interviewees suggested for DTCPA to be executed ethically, they would like to see increased truthfulness about the disorder that the treatment is being advertised to cure, and the full encompassment of the drugs cost, benefits, and potential ramifications.

**Profits serve as a barrier to authenticity**

The depiction of authenticity in DTCPA messaging was composed of statement’s signifying the communicator’s intentions for the message. One strong theme emerged when interviewees were asked how they perceive authenticity of the messenger in direct-to-consumer pharmaceutical advertising. The data concludes levels concern regarding potential conflict of interest between profitability and patients’ best interest in direct-to-consumer pharmaceutical advertising messaging. Authenticity in the T.A.R.E.S. framework is categorically segmented into the following: integrity and personal virtue, sincerity and genuine, and loyalty and independence. Interviewee’s data points to the failure of loyalty and independence as conflict of interest occurs in obligations to clients and employers. Interviewee R perceives DTCPA as a client-serving persuasive advertisement stating that,

“They are only caring about the profit from the product.” – *Interviewee R*

Interviewee concern regarding messaging authenticity play in part as Interviewee J found deception in trickery as this messaging aims to,

“Trick other people just to make a profit for yourself [employer].” – *Interviewee J*

Interviewee M mentions the similar concern while simultaneously rejecting authenticity as present in DTCPA.

“I don’t really think that there’s a lot of things that they’re just kind of doing it for profits rather than actually trying to help people. So, I feel like there’s not much authenticity on there.” – *Interviewee M*

Interviewee J explicitly states the unethicality perceived in authentic direct-to-consumer pharmaceutical advertisements.

“I think that it’s not ethical when these companies are advertising and trying to encourage students to get on these pills when they don’t need them, it’s just to make a profit.” – Interviewee J

Interviewees data concludes authenticity is not present in DTCPA as it fails to meet the loyalty and independence requirement by raising concern in regard to the messengers “moral discernment to ascertain when the demands of these loyalties are perverse, and that independence and adherence to personally held moral principles” (Baker & Martinson, 2001, p. 162). Interviewees raised a shared concern within each principle of the framework that reveals a consistent theme of worry regarding the messengers’ loyalties, and prioritization of profits over client-serving needs. According to digital natives, current DTCPA messaging is presented in a manner that is “forced” “suggestive” and “persuasive.” Interviewees found a strong ethical implication of the messaging that provokes a call to action by the consumer too promptly engage. The lack of ethicality and failure to appear as evident in the T.A.R.E.S. framework is found in loss of respect, authenticity, and truthfulness in the eyes of interviewees. Interviewees found DTCPA pharmaceutical companies fall short of the ethical requirement that must ensure that the consumer is fully informed about the drug, supporting the claim for the need of this aspect to be present in the DTCPA messaging (Jae & DelVecchio, 2022). When asked about perceived respect for the audience, ethical concerns were raised by interviewees as key terms closely related to “forced,” “targeted,” and “cure all” emerged in relation to the advertisements messaging. Initially a finding in the data reinforces the importance of human beings to not be treated merely as a means to an end (Jaksa & Pritchard, 1994) when Interviewee Z illustrates their perception of respect in DTCPA as a comparison between patients and a paycheck. Interviewee Z’s statement reinforces distrust and concern surrounding the ethicality of messaging purely client-serving purposes, in close relation to interviewees perceptions that authenticity’s failure to meet the perceived ethicality in translation through prioritizing profit over client needs.

“I think respect is another big thing is seeing these patients more as people who need help, rather than just a paycheck for these pharmaceutical companies” - *Interviewee Z*

Interviewee Z details negative perceptions of DTCPA as a result of lacking respect in the form of unequitable appeal through suggestive message dissemination on social media platforms. Interviewee Z’s mention “following trends” also alludes to the appearance of entertainment opinion leaders rather than professional, relating back to the first principle of truthfulness mentioned earlier.

“I think that specific targeting of individuals that may perceive themselves within a condition, so specifically like depression, or depression, because that’s when I can think about that, in the event, they are going to like, see somebody following trends on Instagram or any type of social media that may follow them their description or characteristics of someone who may think that they’re depressed or following things that have depressed guidelines to it by pinpointing that there kind of almost like false diagnosing these people. And I think that that’s a very bad thing.” – *Interviewee Z*

Interviewee P mentions feelings of lost respect in the suggestive nature of the messaging as the ad is tailored to audience preference.

“I think that the that having a very targeted approach, like I find it very sneaky, that pharmaceutical companies will put advertisements on social media because it feels like it’s a, it’s a very targeted approach to finding an audience that is susceptible to I mean, people that are in school people that are just about to graduate school people that are stressed. It just feels like it’s a very targeted approach to me making people feel like they need this because they’re feeling all of these symptoms.” – Interviewee P

Loss of respect was found as Interviewee O signifies the importance of the message feeling “forced” into a curable issue with a provided solution at hand.

“I’d say respect is just, like, reaching someone, but also not like forcing it upon them. And like not saying things that are going like oh, yeah, that make the person the audience. Be like, oh, yeah, this is what I need to do. I think that fact, having a respectful message, like, you should look more into this and research this, if you have these issues. This could be something that may help you. But not like, this is what’s this is what’s best for you like not blatantly telling you exactly what to do giving you the power to research that yourself.” – Interviewee O

Interviewee Q also mentions of perceived “force” as disrespect in the context of direct-to-consumer pharmaceutical advertising.

“I would just say to be respectful, just simply don’t show people what they don’t want to see. Like if a person doesn’t like seeing ads for dogs but you keep showing them the same dog ads, I wouldn’t say that’s very respectful. So same goes for the pharmaceutical industry ads.” – *Interviewee Q*

Interviewee O specifically highlights the unethical depiction of a “cure all” persuasive message and calls for the need to promote a problem/solution format in an ethical manner that caters to unique personal characteristics, genetics, and symptoms.

“This, this drug was a cure all it changed my life. I think that that is not a statement that should promote a, a drug because everyone is so different, and everyone’s bodies respond different. And so, you’re saying that this drug is going to help cure everything that’s wrong with you is, that is not true. Okay, so that’s, that’s not a way to promote something, especially for a specific kind of issue.” – *Interviewee O*

Interviewee P also shares concern regarding blanket “cure all” statements are “misleading” and in contribute to the lack of respect present in DTCPA.

“I think having a pharmaceutical, commercial or advertisement on social media, in general, can be very misleading. And it can make it look like this drug is going to be like, a quick fix for a problem that doesn’t have a quick fix to it. And I think that it makes it look like this drug alone is going to cure your ADHD, your depression, your overeating, whatever it is, like I think that it can be very misleading and not incorporating the other aspects that need to be involved with promoting health care.” – *Interviewee P*

The data collected from interviewees represents low levels of perceived respect present in direct-to-consumer pharmaceutical advertising. The T.A.R.E.S. framework revels the findings represent a lack of evident equitable respect in DTCPA.

**Power imbalance between messenger and receiver contributes to lack of equity**

Equity of the persuasive appeal emphasizes the importance of equality in the message. To ethically disseminate a message, considerations must be made to equate all parties. This principle requires content and execution examination to ensure the persuasive appeal is both fair and equitable, if the message has unethically used the power of persuasion. Interviewee J found no equity present in DTCPA as the interviewee explained power structure inequities between the persuader and the persuade in relation to audience reach and one-way communication between the messenger receivers and their communicators (DTCPA).

“I would say that there is almost no equity in this advertising because it’s not equal in any way to the consumer.” – *Interviewee J*

Interviewee J expands upon power inequities through technological concerns regarding susceptibility to believing a persuasive message as a Digital Native.

“We have grown up with technology and with social media and in our brains have been rewired to become addicted to these social media apps. So, I definitely think that we have a different perception on the way we see things and advertisements, because we’re exposed to so many and have been for so long. So, I think we definitely have a different deal.” – *Interviewee J*

Interviewee concern regarding profitability continues to reemerge here as both Interviewee’s J and K restated the “human” factor over profit desires.

“I think the only people that really benefits besides the people who are actually, who actually have these issues, are the advertisers and manufacturers who are making the money. And then the other people are being hurt.” – *Interviewee J*

Interviewee K concludes with a solution to achieving equity, stating a demand for message receiver respect, relating back to the heart of the T.A.R.E.S. test (Baker & Martinson, 2001).

“I would say respecting and realizing that your consumer is not just a paycheck, they’re actual people. So, I think you gotta have to respect pushing a limit, like to know that you can’t just be giving them something that they might not need, or convince them of something that’s not true. You should be honest and respect them.” – *Interviewee K*

As discussed in the literature review and methods sections, the cohort selected for the purpose of this study specifically has had access to technology where DTCPA on social media platforms are present. Although, consideration must also be called to inequities present in relation to other demographics technological access in order to ensure equity is present in DTCPA messaging. Interviewee K highlights the importance of equality in demographic audience viewership and suggests the message must be transparent, and consistent across all demographics.

“The demographics that you’re showing the advertisement to like, you can’t only be showing that to like, one specific demographic, and then like, take advantage of them, whatever, because it’s advertising.” – *Interviewee K*

“I think that it should be very transparent and also consistent across all demographic or all demographics, psychographics, whatever. You name it, like it should say the same, really the same message.” – *Interviewee K*

Interviewees found low levels of equity present in current direct-to-consumer-pharmaceutical advertising messaging. Data reveals lack of equity as messenger receiver power imbalance in access to audience as well as data.

**Deceptiveness Compromises Social Responsibility**

Interviewees particularly expressed concern in relation to audience susceptibility of the message as these platforms are perceived as unethically persuasive by interviewees, outlined in detail in the findings section. Interviewee K outlines concern in application and execution to the audience attention captivation and susceptibility to the message. This principle is the last guiding framework in the T.A.R.E.S. test. Social responsibility is society centric; it emphasizes the importance of the message serving the interest of the common good. Social responsibility and societal duties were closely related terms interviewees used thorough the conducted interviews. When asked during the interviews, all interviewee’s believed social responsibility to be one of the most important considerations to “ethical” direct-to-consumer pharmaceutical advertising. Themes that emerged from the data represent interviewees fear of being unaware of the persuasion as it occurs on platforms without consumers realizing. Interviewee K outlines the deceptive nature of organic ads.

“People just think it’s so organic. It’s just so organic, that people don’t realize that it’s influential.” – *Interviewee K*

Interviewee M reveals a notion to personal experience consuming DTCPA. Negative perceptions were communicated by interviewees while explaining the hook of persuasive appeals through the use of organic ads.

“I've basically seen the same one over and over again. And it’s some person tried to start off by doing something to bring you in. So, either saying something to catch your attention or doing something to catch your attention, and then afterwards, kind of pushing the agenda on you. So, you’re kind of hooked. Then you watch until the end of the video.” ***–*** *Interviewee M*

Interviewee N shares concern over diagnoses through social media platforms and states the use of social media may not be the correct means to execute ethical DTCPA. Lack of social responsibility is evident in DTCPA as Interviewee N claims the diagnosis process to fall short of societal duties that include relaying information in a fair and clear way.

“I think social responsibility and being ethical in your advertisements goes hand in hand. In particular, I think social responsibility is holding true to just basic values. And that’s when the line kind of blurs and advertising because there’s a lot of blurry lines and a lot of things that can impact people internally, without knowing it. So, I think for social responsibility, there is a social responsibility to diagnose people in a fair and straightforward way, and maybe not through the means of social media.” – *Interviewee N*

Interviewee O explains their nod to social media’s effectiveness in persuasive appeals through concern in relation to manipulation that occurs on digital platforms that digital natives have a level of susceptibility to believing.

“Yeah, we are directly affected because that is, that is our life like social medias every single 22-year old’s life 20 like 30 to 20 year old’s life and younger generations, but we’re more prone to being manipulated by these ads, because they make you feel like, especially with social media, they make you feel like this is what is best is what’s best for you. And this is specific to you. And so there, yes, our generation is very effective.” – *Interviewee O*

Interviewee I explained in depth the perceived vulnerability being a digital native and the barriers this audience has been forced to navigate from adolescence.

“It’s just, our generation came around when everything was kind of, you know, started to pick up and we started to believe everything that we saw on the internet. And we didn’t know any better. We’ve never known any better. So, I think it’s kind of hard for our generation to decipher real news from fake news or anything like that, just because it’s what we grew up on. And we were not taught to believe everything on the internet.” – *Interviewee I*

**Concern for future generations**

      An overarching theme present through interviewees data regarding the acknowledgement of unethically persuasive DTCPA messaging circulating frequently through platforms young ages and generations frequent. This conclusion is primarily drawn from the lack of equity principle in the T.A.R.E.S framework. Interviewee E explains the concern that was raised by interviewees for child media users who consume DTCPA messages on social media platforms. Interviewees believe it is the messenger’s social responsibility to carefully consider the persuasive appeal of a DTCPA message specifically pertaining to children as media consumers and that the messengers are currently failing to do so. Interviewee L explicitly stated their perceptions as social responsibility is not evident in DTCPA while the advertisers continue to disseminate on platforms that children frequent.

“I just don’t think it is very ethical to advertise prescription drugs on social media that primarily kids use.” – *Interviewee L*

Interviewee Z highlights concern with social responsibility in targeted messaging for young generations.

“I think especially with the younger generations coming up in the world, social media on your phone is kind of like the largest platform you could probably have, especially with tick tock Instagram, Twitter, things like that. Because with the way that you’re able to write the algorithms for, I guess, the social media platforms that you can directly target whatever you think the product should be going towards those people that they would be willing to buy. And in the event, they don’t buy them, you can still place to kind of like that pin in their mind that they’ll keep coming back to it over and over until they eventually hopefully will buy that product. So social media on your phone, specifically like tick tock, Instagram, Facebook, Twitter are huge platforms and are probably the most effective.” – *Interviewee Z*

Interviewee I highlighted the naive aspect of child that is different from a Digital Native, making social responsibility even less prevalent through the eyes of this interviewee in DTPCA.

“Like especially for younger consumers, if they don’t fully understand or fully know, kind of what the product is, or the actual risks, or what is used for, they could probably self-diagnose and like think they have a problem when they really don’t, or, you know, don’t think they have a problem when they really do.” – *Interviewee I*

Uniquely, Interviewee E mentioned that they believe advertisers of DTCPA are already aware of the unethicality in relation to social responsibility as DTCPA encourages higher levels of prescribing than people who truly need it, claiming over prescribing as profit increases.

“I think that the pharmaceutical companies and the people in authority with those stuff, know that it’s become problematic, because nowadays, I think that it’s become an issue with people getting prescribed Adderall, or whatever medication when they don’t really need it. And I think a lot of those ads are encouraging students to get on Adderall or get on the meds.” – *Interviewee E*

Interviewee Q defines social responsibility through the comparison of the golden rule.

“In direct consumer pharmaceutical advertising, I defined social respect as treating others how you want to be treated, the golden rule. Don’t create a persuasive advertisement you wouldn’t want your kid or sister or grandmother viewing.” – *Interviewee Q*

Low levels of social responsibility were found in direct-to-consumer pharmaceutical advertisements. High levels of need for social responsibility to be present were required by all interviewees in order to achieve ethical DTCPA.

**Discussion**

The T.A.R.E.S. test acted as a sufficient framework thorough the duration of this research. This study addresses a gap in the literature and is significant in the way that it extends the T.A.R.E.S generic framework in a way that shifts focus from the ethicality of the advertiser to the receiver. Baker and Martinson (2001) T.A.R.E.S. framework has traditionally been used to analyze ethics from the messenger side. This study provides key insights from the unique perspective of the message receiver side. This study gives the perspective of the receiver rather than the messenger side. This study found that digital natives do not perceive Baker and Martinson’s (2001) T.A.R.E.S. principles as evident in direct-to-consumer pharmaceutical advertisements on social media platforms through the five themes emerged from the data collected:

*Truthfulness is contextual,* supported the claim for the need for truthfulness to be present in the DTCPA messaging (Jae & DelVecchio, 2022). *Profits serve as a barrier to authenticity,* emerged through themes of concern regarding opinion leaders, prioritization of profits, and suggestive messaging reemerged under the principle of respect in the T.A.R.E.S. test, reinforcing prior claims that respect is at the heart of all the other principles (Baker & Martinson, 2001). *Power imbalance between messenger and receiver contributes to lack of equity* reiterating the demand for message receiver respect, relating back to the heart of the T.A.R.E.S. test (Baker & Martinson, 2001). *Deceptiveness Compromises Social Responsibility*, supporting earlier claims regarding concern in relation to the corrupt nature of pharmaceutical sales (Korman & Fabbro, 2021; Hollin & Ball, 2022; Garrett et al., 2019). This finding directly supports the 2001 study that the effectiveness of creating native advertising unique to individual social media platforms directly affects the messages’ persuasive nature amongst consumers (Wei et al., 2021). As well as qualifies the use of celebrities as a well-established practice by partitioners of Advertising, therefore recalibration is needed in the field (Sabar et al., 2023; Schimmelpfennig & Hunt, 2020; Glenister, 2021). And *Concern for future generations* as participant concern was evident and reinforces earlier claims that DTCPA provokes an increase in patients discovering a new diagnosis (Langdorf, 2016). Furthermore, the findings depict interviewees feelings of loss of respect and DTCPA failing to meet ethical parameters as a result of lack of social responsibility present in DTCPA messaging, reinforcing Bok’s application of “the golden rule” (1995) in relation to the application of the T.A.R.E.S. framework.

This study calls to light the importance of specific ethical guiding parameters to be met and reviewed before disseminating DTCPA messages to this cohort through social media platforms, urging advertisers to take a different approach when attempting to reach this audience. A potential recommendation grounded in the findings of this study calls for an ethical code specific to DTCPA, highlighting the importance of health communication implications through pharmaceutical advertisements. Advertising current code of ethics (American Association of Advertising Agencies, 2016) and does not consider the findings of this study. The new proposed code of ethics should emerge and be governed by the FDA health professionals. The perceived unethical use of perception takes the power away from the message receivers to make an informed decision about one’s health. The following recommendations should be included in the new code of ethics to make it clear the message is an advertisement and is not organically deceiving the receiver:

* All aspects of the T.A.R.E.S. principle must be present.
* Disclose that the message is an advertisement from the beginning.
* Do not target specific audiences based on audience resonation with curated messaging.
* Do not diagnose audience using “suggestive” words.
* Make room for open two-way communication between the messenger and receiver.
* Messaging should be strictly generic and informative.

Due to the limited sample size, gender-based implication is present in this study interviewed 9 out 12 were females. Future studies should consider including a more diverse sample of gender identities. Furthermore, this study recruited participants primarily on the west cost region of the United States. Future studies should consider including participants from all regions of the United States to gain a more comprehensive understanding of this cohort nationally. Audience health determinants is largely dependent on the perceived need of the specific advertised product prior to consuming the message. Future research should consider interviewing individuals with prior experiences of chronic dieses who seek health related information more frequently.

**Conclusion**

In conclusion, this study depicts the perceptions of ethicality in direct-to-consumer pharmaceutical advertisements from the perspective of the media consumer – digital natives. Based on the T.A.R.E.S. test, this study found low levels of ethicality in relation to meeting the individual principles of Baker and Martinson’s (2001) T.A.R.E.S. test. Results showed that unanimously, DTCPA failed to execute evidence of ethical messaging though persuasive appeals in the eyes of digital natives. Negative perceptions are held by this cohort through concern of prioritizing profits over client needs, the audience susceptibility consuming persuasive messaging on platforms that initially provide a persuasive aspect already and stressed immense concern for future generations to come that will consume the current direct-to-consumer pharmaceutical advertising. Examples of DTCPA that interviewees have found, witnessed, and referred to can be found in appendix A.

**Appendix A.**

**Graphical user interface

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*Figure 1. ADHD DTCPA*

**Diagram

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*Figure 2. Weight Loss Prescription DTCPA*

**A picture containing graphical user interface

Description automatically generated**

*Figure 3. Diagnosing DTCPA*

**Graphical user interface, website

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*Figure 4. DTCPA using Opinion Leader*

**Appendix B.**

**TITLE:** Applying the T.A.R.E.S. Framework to Examine Digital Natives Perceptions on the Ethicality of Direct-to-Consumer Pharmaceutical Advertisements on Social Media

**Principle Investigator:** Ashton DeBacco

**Interview Script/Question List**

1. How often do you use social media?
2. How often do you see advertisements on social media?
3. How do you feel about seeing advertisements on social media?
4. What types of advertisements do you see on social media most?
5. Can you describe your experiences with direct-to-consumer pharmaceutical advertisements on digital platforms?
6. What platforms have you seen DTCPA on previously?

* Do you see direct-to-consumer pharmaceutical advertisements on social media often?
* Do you believe that direct-to-consumer pharmaceutical advertisements on digital platforms can influence consumer behavior and decision-making? If so, how?
* Are there any specific digital platforms or technologies that you believe have a greater impact on consumer behavior in relation to DTCPA?

1. Can you give me an example of a DTCPA message you found problematic?

* How do you perceive the ethicality of direct-to-consumer pharmaceutical advertisements on digital platforms?

1. How do you define truthfulness in DTCPA?
2. How do you define authenticity in DTCPA?
3. How do you define respect in DTCPA?
4. How do you define equity in DTCPA?
5. How do you define social responsibility in DTCPA?
6. In what order would you rank the importance of each principle mentioned (Truthfulness, Authenticity, Respect, or Equity) for DTCPA?
7. Which of the five principles (Truthfulness, Authenticity, Respect, or Equity) is most important to ethical DTCPA?
8. Do you believe that digital natives have a different perception of the ethicality of DTCPA compared to other age groups? Why or why not?
9. How do you think that the regulation of DTCPA on digital platforms could be improved to ensure greater ethicality?
10. Is there anything I haven’t asked that’s worth noting or exploring further?
11. Do you have any questions about this study, the procedures, or your rights as a participant?

**Appendix C.**

## Title of research study: Applying the T.A.R.E.S. Framework to Examine Digital Natives Perceptions on the Ethicality of Direct-to-Consumer Pharmaceutical Advertisements on Social Media

## IRB Protocol Number: 22-0605

## Investigator: Ashton DeBacco

***Purpose of the Study***

This research study examines the current ethical parameters guiding direct-to-consumer pharmaceutical advertising through social media platforms, specifically to understand the impact of persuasive advertising strategies on digital natives through social media. To explore digital natives’ perceptions of persuasive advertising tactics used on social media channels.

Secondary research has been conducted to gain a deeper understanding of the prior research and knowledge acquired regarding persuasive advertising tactics through direct-to-consumer marketing of pharmaceuticals on social media platforms to date. These topics include information regarding DTCPA's evolution, adoption, and current state calling special attention to social media and digital natives as a primary audience through the ethical lens of the T.A.R.E.S. (Truth- fulness (of the message), Authenticity (of the persuader), Respect (for the persuadee), Equity (of the persuasive appeal) and Social Responsibility (for the common good)) framework.

Expect that you will be in this research study for no longer than 90 mins. During this time, you will be asked a series of interview questions inquiring about your social media habits and feelings.

We expect about 30 people will be in this research study.

***Explanation of Procedures***

In depth one on one interviews will be conducted in Norlin Library study rooms or on Zoom. You must sign an informed consent form before the interview begins. To ensure the study maintains confidentiality, all identifying data will be discarded immediately after coding the transcription.

Upon completion and signing the Consent Document, I will schedule a time for the interview to take place either in person or virtually dependent on your preference. A copy of the interview questions will be shared with you before the interview takes place.

Once the interview has concluded and the recordings are transcribed, any identifying information will be destroyed immediately.

***Voluntary Participation and Withdrawal***

Whether or not you take part in this research is your choice. You can leave the research at any time and it will not be held against you.

***Confidentiality***

Information obtained about you for this study will be kept confidential to the extent allowed by law. Research information that identifies you may be shared with the University of Colorado Boulder Institutional Review Board (IRB) and others who are responsible for ensuring compliance with laws and regulations related to research, including people on behalf of the Office for Human Research Protections. The information from this research may be published for scientific purposes; however, your identity will not be given out.

***Payment for Participation***

You will not be paid to be in this study.

***Questions***

If you have questions, concerns, or complaints, or think the research has hurt you, talk to the research team at [asde1253@colorado.edu](mailto:asde1253@colorado.edu)

This research has been reviewed and approved by an IRB. You may talk to them at (303) 735-3702 or [irbadmin@colorado.edu](mailto:irbadmin@colorado.edu) if:

1. Your questions, concerns, or complaints are not being answered by the research team.
2. You cannot reach the research team.
3. You want to talk to someone besides the research team.
4. You have questions about your rights as a research subject.
5. You want to get information or provide input about this research.

***Signatures***

Your signature documents your permission to take part in this research.

Signature of subject Date

Printed name of subject

**Appendix D.**

**Table

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