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Narrative transportation cues in direct-to-consumer advertisements: an analysis of visual content

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The pharmaceutical industry uses Direct-to-consumer advertisements (DTCAs) to persuade consumers: they communicate stories about health and are regulated closely by the Food and Drug Administration (FDA). Advertisers are required to balance positive outcomes with the risks and side effects associated with the medication promoted. In 2023, the FDA added that the major statement must be presented in a clear, conspicuous, and neutral manner. Visual narratives captivate viewers and are highly persuasive, but few studies have examined their cues closely. Transportation, a component of Narrative Theory, was used in this research to analyze the visual stories in 49 DTCAs. The ads aired on the top 10 broadcast network and cable television programs at the end of the 2016 and 2018 seasons. The following transportation cues were identified and analyzed: novelty; vivid sensory information, and visual-verbal redundancy (VVR). The majority of the ads contain multiple exemplars and stories that culminate in a unifying positive message about the effects of taking the medicine advertised, and imply its role as a catalyst for improved health. The transportation cues studied indicate that these ads are engaging in novel ways and use strategies that blur the lines between reality and fiction. In addition, VVR communicates such positive information frequently. Understanding the visual representations and transportation cues increases DTCA literacy, contributes to ongoing research by the FDA and policy development, and informs consumers and healthcare practitioners about the ways in which pharmaceutical companies present their products to the public.

KEYWORDS

narrative, persuasion, transportation, visual cues, DTCA, visual-verbal redundancy

Introduction

Legislation was enacted in the early 1900s that initiated the process of protecting consumers from deceptive drug advertisements during a time when medicine was purchased directly from a pharmacist and when such advertisements appeared in papers or posters. Of course, both the advertising and pharmaceutical industries have changed significantly, but the crusade to protect the consumer from misleading advertisements continues.

The first DTCAs broadcast (1980s) were regulated strictly, but in 1996, the FDA relaxed their restrictions. Broadcast advertisers were permitted to reduce the information in DTCAs from full disclosure to adequate provision, which translates to ensuring that the information is not false, the benefits and risks are balanced, the major risks are included, and the ad uses consumer-friendly language (21 CFR202.1; [USFDA Guidance Document, 1999](#)).

New research indicates that the FDA rules must be revisited; cognitive science and distraction studies by institutions such as the Center for Biologics Evaluation and Research and Center for Drug Evaluation and Research have influenced updates in FDA guidelines within the past year (see [Aikin et al., 2024](#)). The revisions include requirements that DTCAs be presented in a clear, conspicuous, and neutral manner, and meet the following five key standards:

1. Information must be presented in consumer-friendly language.
2. The major statement (the most important risks associated with the drug) must be presented simultaneously through audio and visual channels [i.e., dual modality, also known as visual-verbal redundancy (VVR)].
3. Text must be easy to read.
4. There should be no audio or visual elements that could distract from the major statement.
5. An actor should not portray a medical professional and if they do, a disclaimer should be displayed prominently ([U.S. Food and Drug Administration, 2023](#)).

Advertisers in the United States had until November 2024 to comply with these standards. It is interesting to note that currently, only the United States and New Zealand are permitted to broadcast DTCAs, but governments in other countries are being compelled to lift their ban on DTCAs because of claims that they are beneficial and empower consumers. However, [Schulz et al. \(2023\)](#) studied DTCAs' effects and found no evidence that they increase consumers' perception of empowerment. When considering the overall value that DTCAs might provide to the consumer, further research in this area is warranted.

DTCA advertising background

Prevalence and effectiveness

DTCAs are pervasive and effective in encouraging viewers to ask their doctor if a certain prescription medication is right for them. The number of ads that are entering the market and the money being spent on pharmaceutical advertising are continuing to increase. In 2020, the FDA received 564 new television ad submissions ([U.S. Food and Drug Administration, 2023](#)) and spending on broadcast DTCAs increased from 1.9 billion in 2022 to 2.1 billion in 2023 despite falling viewership ([MediaRadar, 2023](#)), which makes pharmaceutical advertising one of the largest expenditures in the country ([Faria, 2024](#)).

These seemingly ubiquitous ads have been shown to be highly persuasive. [Armantier and Namoro \(2006\)](#) found that DTCA exposure increases compliance with health practitioners' recommendations. There is evidence that such ads can influence diagnoses and treatment. For example, ads for anti-depressants have been found to promote proactive communication between patients and doctors ([Block, 2007](#); [Goyal et al., 2015](#); [McKeever, 2014](#)). DTCAs' persuasiveness affects physicians as well and they are likely to prescribe a medication that a patient has requested after having seen an ad ([Avery et al., 2012](#); [Joyce et al., 2011](#)). The [U.S. Government Accountability Office](#)

(2021) reported that over 58% of spending in 2021 on Medicare Parts B and D covered advertised drugs. Pharmaceutical companies' expenditure on advertising continues to increase, and consumers and physicians are being persuaded by the DTCAs that saturate the airwaves. It is important to note that while this study did not interview or survey viewers of DTCAs to determine their actual effects, the data gained by analyzing the content and mechanisms of such ads closely offers a clear understanding of the message(s) that they communicate about health.

Distractions in DTCAs

When considering content, it is worthwhile to address the phenomenon of distracting imagery during the presentation of risk information in pharmaceutical advertisements and how it might violate FDA rules. [Sullivan et al. \(2017\)](#) studied distracting imagery's effects by creating hypothetical DTCAs with low-distraction or high-distraction features and showing them to participants during the presentation of the major statement. In the low-distraction hypothetical DTCA, a male narrator read the risk information as he stood still and spoke to the camera directly. The high-distraction ad mimicked the format of actual DTCAs, with an emergent or ongoing narrative presented during communication of the risk information. The authors used eye-tracking technology and found that the distracting elements of the ad (the visual narrative displayed in the background) drew attention away from the risk information, even when it was presented in dual modality (audio and text). In addition, questionnaire responses indicated that the distracting elements reduced the viewers' retention of the drug's risks and that they paid more attention to the narrative than the risk information. Similarly, FDA researchers confirmed that distractions during the presentation of risk information affect consumers' attention and recall of the side effects ([U.S. Food and Drug Administration, 2023](#)).

Although DTCAs are pervasive and there has been notable research on their effects, research that has focused solely on narratives in DTCAs is still emerging. [Ball and Applequist \(2019\)](#) were among the first to examine narratives in broadcast DTCAs and look exclusively at the way information was conveyed through first-person, second-person, or third-person perspectives. Doing so allowed them to identify specific styles of narratives (classic drama or vignette). They categorized classic drama as one character (or set of characters) that acts out a single continuous story, while vignettes include multiple actors with individual stories that culminate in multiple storylines. Although it was not their goal, they determined that all DTCAs include some type of narrative. Other research on narratives in DTCAs has focused specifically on transportation and identification, which are components of narrative persuasion. [Montgomery \(2019\)](#) confirmed the findings of previous research that all DTCAs include some form of narrative, and also found that the majority of narratives are presented visually with ads that begin with a healthy exemplar (implying positive results of using the medication). Delving into the theoretical framework of the use of the narrative underpins its use in DTCAs and lays a foundation

for this research's focus on analyzing the content of health messages in DTCAs.

Theoretical framework

Narrative theory

Narrative theory studies the way in which stories are structured and used to understand the world. This is predicated on the idea that humans are natural storytellers (Fisher, 1985), and meaning is created within the interaction of events in the segments of a story (Puckett, 2016). Narratives illuminate and explore human existence (Chatman, 1978; Fisher, 1985) and reflect a broad range of experiences such as love and loss, birth and death, and conquest and defeat (Slater and Rouner, 2002). These experiences are communicated through the discourse of a story, which includes emotional appeals, aesthetic experience (engagement through emotional expression), and the objects and places represented (Cohn, 2013; Marković, 2012).

Early research in narrative theory focused exclusively on literary works. However, Chatman (1978) argued that visual features should be included in narrative analysis. Other scholars have argued that the visual structure in a story is integral to the meaning of its content (Barbatsis, 2005) and should be analyzed exclusively. Because DTCAs are largely visual in nature, extending narrative theory and its application to visual media allows for an in-depth analysis of the way that such ads work.

Visual narrative

Visual narratives are an explicit communication of events through visual means as seen and understood by a viewer (Pimenta and Pooviah, 2010). Barbatsis (2005) asserted that the visual elements of a narrative express meaning immediately in a way that words do not. Visual narratives are communicated non-verbally through the events, the setting, the demographic characteristics of the exemplar (a personified example, or a protagonist, main, or perspectivizing character), and the exemplar's behavior (Siberska, 2017). Further, meaning making, a central element of narrative theory, is created in visual narratives through a character's behavior. These behaviors are not limited to their actions, but also include non-verbal communication, such as gestures, facial expressions, and movements (Barbatsis and Guy, 1991; Bell, 2004; Chatman, 1978; Messaris, 1997; Ryan, 1992; Siberska, 2017).

Visual narratives are a primary characteristic of DTCAs, whether they portray a single story of one exemplar or several stories with different exemplars (e.g., see Ball and Applequist, 2019). Seo (2009) reviewed research that related these two components and found a consensus that positive visual imagery is an effective advertising strategy. The analysis included research that reported that such positive imagery as a sunrise elicits a positive response in viewers, while such negative images as an animal crouched for attack elicit a negative response. One study found that a visual image of actual people or subjects was more effective than one that used drawings or cartoons. Another noted that positive photographs used in beverage and cigarette advertisements amplified persuasion, compared to neutral or negative images. It was found that filmed stories also have the potential to captivate, arouse emotions, and transport viewers through visual imagery.

Given visual narratives' effectiveness in advertising, it is important to identify and analyze the images in DTCAs and understand the story(ies) that they communicate in addition to the spoken word. Studies on images in DTCAs continue and a close analysis of the visual stories that they represent contributes to ongoing research.

Theory and existing research inform **RQ1**: What message(s) about health are communicated in the visual stories of a DTCA?

Narrative persuasion

Narrative persuasion examines the relation between narratives' power and their ability to persuade. Narratives are powerful because of the cognitive and emotional interaction between the viewer and the unfolding story. Visual elements increase narratives' persuasive power (e.g., see Ching et al., 2013; Slater, 2011) because they invite generalizations and causal interpretations, heighten contrasts, and create analogies for the viewer (Messaris, 1997; Niederdeppe et al., 2008). Narratives are also an effective persuasive tool, even more than analytical or argumentative messages (Dal Cin, 2004; Green and Brock, 2002; Hoeken and Fikkers, 2014). Narratives persuade because they engage viewers wholly, and when viewers are engaged in a narrative completely they are absorbed or transported into the story. This transportation acts as a distraction that reduces counterarguing and disengages critical processing (Bilandzic and Busselle, 2013; Niederdeppe et al., 2008).

Narratives also influence attitudes and behavioral responses (Castonguay et al., 2016) as a result of viewers' heightened emotional responses (Slater, 2011) when their senses are aroused and stimulated (Bateman and Wildfeuer, 2014). Sensory arousal and stimulation occur through two prominent paths: transportation and identification (Igartua and Vega Casanova, 2016), which are distinct yet interdependent processes. This research focused uniquely on transportation cues, which have the ability to engage viewers and draw them into the storyline, which some scholars have argued facilitates identification (see Green and Clark, 2013).

Transportation in narrative persuasion

Transportation is defined further as "... narrative information processing in which a person not only attends to information but is also absorbed into the flow of a story in a pleasurable and active way" (Wang and Calder, 2006, p. 160). Green and Brock (2000) explained that "... transportation is a distinct mental process, an integrative melding of attention, imagery, and feelings" (p. 701). Transported viewers block outside stimuli when they are immersed in a story completely; this blocking heightens emotional engagement with the narrative and characters. Emotional responses are related to the characters' portrayals and behaviors (Cho et al., 2014; Tukachinsky, 2014) through vivid visual cues, dramatic plot structures, and outcomes. Thus, the viewer relates the story to their own experiences (Ching et al., 2013; Krakow et al., 2017; Slater, 2011) with the perception that the events are feasible (see Green and Brock, 2000; Fisher, 1985). Transported viewers pay close attention to the emerging story, which is associated with positive perceptions of the brand and advertisement, more favorable emotions toward the product, and the disengagement of critical evaluations (Ching et al., 2013). Transportation also reduces counterarguing through this cognitive engagement or distraction (Green and Brock, 2000; Slater and Rouner, 2002).

Research that isolates only the transportation cues in narratives is limited (see [Montgomery, 2019](#)). However, there is an abundance of literature that presents realism and vivid content as cues that elicit transportation (see [Fisher, 1985](#); [Green and Clark, 2013](#); [Cho et al., 2014](#); [Han and Lou, 2021](#); [Weber and Wirth, 2014](#)). There are similar outcomes between transportation in text and audio-video stimuli, including enhanced attention, increased empathy, improved comprehension, recall, and recognition, and positive attitudes toward brands and an advertised product.

Visual narrative transportation

[Nikulina et al. \(2024\)](#) defined visual narrative transportation (VNT) as “... a temporary state experienced by consumers of a visual story... [that distracts] ... their attention, imagery, emotional involvement, or any combination thereof” from their surroundings to the story represented by the image (p. 607).

[Green and Brock's \(2000\)](#) work on transportation in written narratives underscores mental imagery's importance as a catalyst for transportation. The work on still images purports a similar manifestation of transportation through mental imagery. Yet, as it is, this framework is insufficient to understand VNT in video or film. [Reinhart et al. \(2021\)](#) found that readers were able to construct mental images while they read a written narrative, but participants who viewed a video were confused when asked about their mental visualization. Their findings support the need for thorough exploration of VNT when visual stimuli are provided through film or video.

While viewers' transportation in VNT and film has been documented well, these similar concepts often use different terminology. Terms used to describe circumstances that lead to transportation in film include: realism and its subcomponents, typicality and novelty, and vividness with its subcomponents of vivid images (colorful, large, describing transportation processes). Both VNT and film use the term “realism” to explain one aspect of transportation; however, other different terms have similar meanings. Similar concepts with different terms include: in film, the terms used are “vividness,” and “emotional displays,” which includes sensory information. In VNT, these concepts are included in visual complexity, background design, image intentionality, and taboo imagery (see [Nikulina et al., 2024](#)).

Realism, or perceived realism, stimulates emotional involvement ([Cho et al., 2014](#)) and is effective in transportation-based belief change ([Fitzgerald and Green, 2017](#)). In film and still image research, it is identified as consistency between objects and real-life representations. Realism refers to the presentation of events that occur commonly ([Weber and Wirth, 2014](#)), that include realistic characters and characters' response to events, and realistic settings and situations in a story ([Green and Fitzgerald, 2017](#)). Typicality and novelty are elements of realism, as they enhance the persuasiveness of a message ([Han and Lou, 2021](#)) regardless of whether or not there is truth-value in a story ([Fitzgerald and Green, 2017](#)). Typicality is the likelihood of events or the degree to which a character's characteristics resemble real-world counterparts ([Han and Lou, 2021](#)), while novelty is a deviation from expectations. Novel information is presented to the viewer in an engaging, interesting, and unanticipated way, and taboo

imagery may also be a subpart of novelty. [Zhang et al. \(2016\)](#) measured the effect of novelty appeals in HIV/AIDS PSAs and determined that novel appeals transported individuals by garnering greater attention. Their appeal criteria for novelty included “novel,” “unique,” “innovative,” and “creative.” Novel appeals deviate from other appeals and require greater attention to the unfolding process (p. 854).

Image intentionality is a subcomponent of realism in still-image studies that refers to the inclusion of diverse narrative elements that provide context-based understanding. [Lim and Childs \(2020\)](#) compared the transportability of images with multiple narrative elements to those that were directed (posed) artificially. They found that images with greater narrative content, rather than posed images, were more effective in transporting viewers. Narratives that unfold visually, as if they have developed organically, are more transporting than images that appear posed or staged.

Vividness demands attention and engages viewers emotionally. The [U.S. Food and Drug Administration \(2009\)](#) defines vivid visual images as “... images, pictures, or other visual stimuli that are emotionally or cognitively interesting, attention-getting, compelling, provoking, or personal in a sensory, temporal or spatial manner” (p. 19). Specifically, they are displayed through colorful messages, close-ups that increase attention and induce emotional experiences ([Messaris, 1997](#); [Appel et al., 2019](#)), and provocative imagery. They involve the senses and the quality replication of sensory information ([Ching et al., 2013](#)). In addition, [Cho et al. \(2014\)](#) explained that “... compelling and convincing audio, visual, and other sensory elements of a mediated narrative message may bolster the audience's judgment quality of the narrative” (p. 836). Color is a variable that is manipulated often to test attention and engagement. For example, colorful screens that pop up when a man opens different flavors of Lay's potato chips and indicate enjoyment on the part of other actors in the advertisement ([Ching et al., 2013](#)), red vs. black text displays of risk information in a DTCA ([Ju and Park, 2018](#)), colorful pictures on cigarette packaging warning labels ([Ophir et al., 2019](#)), and a visual image of two African American and one White man to demonstrate that Black men are at twice the risk of dying from prostate cancer compared to Caucasian men ([Niederdeppe et al., 2008](#)). [Balint and Rooney \(2019\)](#) found that close-up shots affect cognitive and affective processing of narratives.

Visual cues are a type of sensory marketing, a technique that uses appeals that stimulate one or more of the seven senses. Marketing research has established that the visual cues in an ad, which are designed to evoke a sensory response, increase its persuasiveness and create a positive impression of the brand overall ([Haase et al., 2020](#); [Roose and Mulier, 2020](#); [Yoon and Eun, 2012](#)). There is evidence that appeals to multiple senses are more effective than those to only one sense, although sensory visual marketing research has been limited predominantly to food and beverages. Similarly, persuasion varies among the types of products advertised. For example, [Roose and Mulier \(2020\)](#) found that single sense cues are more effective for healthy foods, while multiple-sensory cues are more effective for unhealthy foods. In their study, they created two print advertisements for a fictional brand of tomato. One ad contains several images and angles of the tomato and a woman biting into a tomato, which appeals to

taste. In the other ad, there are several images of the tomato and the woman interacting with it. The images of the tomato are at varying angles and closeness; the image with a woman shows her smelling, tasting, and a close-up of her hand touching it. Their results showed that the single-sense appeal was more effective than the multiple-sense appeal, even though this contradicts research that has demonstrated that multi-sensory cues are more effective. Visual sensory cues' effect on advertising persuasiveness underscores the importance of expanding the research to other types of advertising.

Narrative theory and advertising

Several studies have explored narratives in advertisements and confirmed stories' potential to increase a message's perceived credibility, create positive perceptions of the product advertised, and persuade transported viewers. Narrative ads use several actors to portray an unfolding story (see Escalas, 1998) and, according to narrative theory, transported viewers reflect the attitudes and intentions of the emergent story (Green and Brock, 2000). Buga (2011) explained that the stories in advertising are constructed in a way similar to those in fictional texts. She found that the relationship cultivated between the narrator, consumer, and main character creates a strong connection between the product, brand, and consumer, and the exemplar's transition from conflict to resolution increases the message's credibility. Similarly, positive perceptions of a product are intensified by transportation into a narrative (Dal Cin, 2004; Escalas, 2007). Chen and Chang (2017) stated that "... the power of narratives cannot be underestimated" (p. 37); their research expanded to mini-film advertising and confirmed the findings of existing research. They found that transportation in this medium also reduced counterarguing and increased persuasion thereby. Specifically, the images themselves and the way that they are structured affect viewer persuasion. Li et al. (2024) tested visual images' power in destination advertising. They found that candid imagery (compared to posed images) and narrative transportation increased the advertisements' effectiveness.

Narrative theory and health advertising

Health advertisements are one genre that uses narratives, although transportation as a tenet of narrative theory has yet to be explored exclusively. Health advertisements in this research are defined as "... advertisements that use health narratives as a strategy for persuading a consumer to buy a health product, change a health behavior, or change a belief" (Montgomery, 2019, p. 41). Research on health narrative advertisements has included various public service announcements on alcohol abuse and cervical cancer prevention campaign effects (Cho et al., 2014; Hoeken and Sinkeldam, 2014; Murphy et al., 2011; Krakow et al., 2017), among others. Research on narratives in DTCAs is limited, although Ball and Applequist (2019) established that all DTCAs indeed include some form of narrative. They provided a framework to understand the structure of the narratives used (classic drama or vignette) better and explain the way that symptoms or consequences associated with the health condition were personalized through the use of first-person or second-person narrative language. Further, they explained that drama was often used to highlight "... experiences of the health condition" (p. 519). Escalas and Stern (2003) found that drama

in advertisements that evokes sympathy and empathy enhances positive attitudes toward the advertisement. However, there is a gap in the literature that links narrative transportation and visual narrative cues directly to DTCAs. In addition, Deng et al. (2022) compared informational, transformational, and narrative strategies in COVID-19 advertisements from around the world. They found a positive correlation between storytelling and perceived transportation. They also found that narrative advertisements were longer and included more "mood cues" (p. 634).

Research that has isolated the visual elements of narratives in DTCAs is also limited. Welch Cline and Young (2004) and Willis (2017) analyzed the visual narratives in print advertisements. However, few have isolated the visual cues in broadcast DTCAs for analysis (see Ball and Applequist, 2019; Dahlstrom et al., 2017) and even fewer have identified transportation cues (see Montgomery, 2019). Ball and Applequist (2019) suggested that visual and verbal narrative formats in DTCAs should be examined independently. This research isolates DTCAs' visual elements and identifies transportation cues in the ads to address **RQ2: What transportation cues are used in the visual stories in DTCAs?**

Visual-verbal redundancy as a vivid cue

Visual-verbal redundancy (VVR) is a form of vivid cue that warrants individual attention. This cue involves communicating the same information via two modes of delivery: text on the screen is spoken verbatim simultaneously. This draws attention to and highlights the information that is being communicated. Work on VVR has illuminated its positive effect on memory retention, learning, and comprehension (Adesope and Nesbit, 2014). Interestingly, it has been shown to decrease cognitive load and perhaps serves as a heuristic cue (e.g., see Albers et al., 2023; Russell et al., 2018; Trypke et al., 2023). There is evidence that when the visual images and verbal text are contradictory, individuals defer to the visual image for understanding. For example, Grabe (2020) pointed out the contradiction and preference to dismiss side-effect information in DTCAs when visual images of smiling, healthy people were presented at the same time. She coined the contradiction "non-redundancy." However, DTCAs use narratives as a persuasive mechanism and VVR use is not limited to the presentation of side effects. Positive information about the drug is also conveyed through VVR as it is a vivid way to attract a viewer's attention (Montgomery, 2019). Although it has not been studied for its transportability, it is an integral part of each advertisement. DTCAs use VVR during the presentation of the major statement (as FDA regulations require) and at other times throughout the advertisement. When VVR is positioned as a vivid visual cue presented during a story, it is important to understand the way that it intersects with the ongoing narrative, particularly given VVR's propensity to increase learning, comprehension, and retention.

To address the specific ways in which VVR is used in DTCAs, the following research question is posed: **RQ3: In what ways is visual-verbal redundancy used during an ongoing visual narrative in DTCAs?**

Methods

Content analysis was used to isolate and examine visual transportation cues and VVR in DTCAs. This method, with its directed application of codes, contributes to consistent results and prevents deviation. The content analysis used in the study focused on DTCAs that aired in the spring season during episodes and season finales of the top 10 network and cable programs (NBC, CBS, ABC, and Fox). Broadcast television was used because of its extensive reach to multiple audiences and large viewership, and the DTCAs running were likely to have diverse strategies and complex narratives to appeal to a diverse mass audience. Ads that ran during these programs were chosen for their popularity and the fact that they were newly aired and not in syndication. In addition, culling ads from the final months and season finales increased the likelihood of reaching dedicated viewers as well as captive audiences.

Sample

First, the top 10 network and cable programs in March of the 2016 and 2018 seasons were identified and recorded according to Nielsen ratings reports. The programs chosen were: *The Big Bang Theory*, *The Voice* (Monday and Tuesday nights), *NCIS*, *Little Big Shots*, *Empire*, *Dancing with the Stars*, *Blue Bloods*, *60 Min*, *The Good Doctor*, *Grey's Anatomy*, *Young Sheldon*, *Bull*, and *NCIS New Orleans*. The DTCAs from each recording were isolated and yielded a total of 62. Of these, 10 ads were duplicates, which left 52 remaining for analysis. However, after the COVID-19 pandemic, three of the ads were edited to include COVID-19 information, and thus, they were removed from the dataset as well. The ads were saved on a computer and then uploaded to NVIVO, which is ideal because of its ability to organize and code large sets of videos at specific time points. Emergent themes were documented and each code's frequency and percentage were calculated.

Coding scheme for RQ1

The coding methodology was used to address the following research question:

RQ1: What message(s) about health are communicated in a DTCA's visual stories? To answer this question, the exemplars' visual health in the 49 DTCAs was assessed. They were identified as completely healthy or symptomatic at the beginning of the ad and healthy by the end. The sample ads were watched and data were recorded in an Excel spreadsheet, which was then imported into an NVIVO project. The information recorded about the ad included the title, a summary of the visual story, the narrative type, the activity in which the exemplar was engaged, and the exemplar's health condition during the narrative. The advertisement title was listed first. The advertiser creates the advertisement titles, which include the name of the medicine advertised and a general title that reflects the content in the ad (e.g., Cosentyx See Me; Cosentyx is a medicine that treats psoriasis). Then, the ads were summarized and key information was identified. The narrative type was categorized as "classic drama" or "vignette" and the exemplar's

observable health was identified as healthy (showed no health symptoms related to the condition that the medication treats— asymptomatic) or restored health (symptomatic at the beginning of the ad, but asymptomatic as the ad progressed). In vignette advertisements, the health condition was categorized according to the condition(s) represented in the ad: healthy if none of the exemplars was symptomatic, restored health if all of the exemplars were symptomatic at the beginning and their health was restored by the end of the ad. Wellness and restored health were categorized if some exemplars were asymptomatic and some were symptomatic. Trained coders coded the setting and exemplar's actions.

Realism and vividness were coded to answer RQ2: What transportation cues are used in the visual stories in DTCAs?

Data preparation

The next step was segmenting the individual scenes in the sample DTCAs. Wang et al. (2000) explained that multimedia text is complex and must be segmented into scenes so that each "corresponds to a story unit" (p. 12). A scene was identified in this research by an exemplar's (may include other actors) continuous movement through a particular setting during a singular event. There were multiple scenes in each of the DTCAs (687 scenes overall), and isolating each of them allowed for an in-depth examination of each unit of analysis. Each advertisement was saved in a folder on the computer and then imported into a project in NVIVO. After all of the advertisements were imported to a file entitled "video files for visual information," the timespans for each scene were created. NVIVO has a preset column for timespan, content, and speaker; editing functions to create timespans allowed each scene to be marked at its beginning and end. Some of the scenes overlapped, and in those cases, it was necessary to adjust the timestamp manually. Such precise measurements were important so that data would be coded to the correct scene.

Coding scheme for RQ2

Codes were developed using an *a priori* deductive approach, and were derived from research in the literature that discussed the components of transportation in narratives, including realism, vivid imagery, and vivid sensory cues (see Table 1). After completing the framework for the codes, five ads were selected randomly to test the framework. After several iterations of those five ads were observed, the emergent codes were tested on five additional ads, so that all codes were applied to a total of 10 ads. During the sample coding, it became apparent that typicality and novelty were redundant, and although realism includes typicality and novelty, only novelty was used. Novelty is defined as a divergence from expectations that is interesting and unanticipated or presents information in an unexpected way. Therefore, novelty codes were determined by visual information that was unique, unanticipated, engaging, and interesting. For example, showing a split screen with the sick person on one side in bed as they watch their family eat out with friends at a restaurant on the other would be considered a novel approach. As defined in the literature, novelty appears to be subjective. There are no clearly defined steps in the literature to determine novelty in an image

or video. However, coders were instructed to code scenes that appeared unique, interesting, innovative, engaging, surprising, or unanticipated. The data coded as novel were downloaded and described in a Word document, and then categorized.

Vivid cues are images that appeal to the senses or images used in such a way that they promote a clear image or powerful feeling. Vivid transportation cues are identified by information that highlights sensory information or those with bright colors, intense or graphic imagery, and close-ups. Sensory appeals are defined as images that appeal to the sense of sight, touch, taste, smell, sound, balance (body orientation), temperature, or pain specific to the exemplar. Only sensory information that was highlighted obviously to draw attention, awareness, or focus was coded. For example, squinting eyes, rubbing the back of one's neck, eating food in which the emphasis was placed on eating, shivering from the temperature, an exemplar on a seesaw evoking a feeling of balance, hands on head as if in pain, or any combination of these. Temperature is a type of touch sensation, but was considered separately in this research because of its association with diminished health (fever). Other vivid images that do not necessarily appeal directly to the senses, but are powerful and emphasized nonetheless, include a dog or cat shaped like the words "sleep" or "awake," charts, graphs, simulated drawings, and information on a split screen with an exemplar, or the lose-up of the product or exemplar, or emphasis placed on either (see Table 1 for an overview of cues).

The following *a priori* coding framework was used to answer RQ2: What transportation cues are used in the visual stories in DTCAs?

A detailed codebook was created and definitions were provided for each code and subcode (see Table 2). The researcher trained two coders, and their coding analysis was compared to the researcher's. Their questions were answered and they were set up with an NVIVO account, and given access to the DTCAs collected. To assess interrater reliability, the same 10 ads were uploaded (20% of the entire dataset) to each NVIVO account for collaborative coding. Once the 10 ads were coded and were over 80% consistent, the remaining ads were distributed evenly for coding. The literature provides generalities only about novelty: unique; interesting; engaging, and innovative. Therefore, scenes coded as novel were isolated and an explanation of the novel imagery was recorded separately in a Word document to be categorized.

All VVR was coded to answer RQ3: In what ways is visual verbal redundancy used during an ongoing visual narrative in DTCAs?

Data preparation

The file "Video files for visual information" created in NVIVO for RQ2 was copied and entitled "Video files with transcription." It was necessary to have a separate file with the transcription to eliminate confusion between codes and narration. The scenes were transcribed manually and each scene was watched as many times as necessary to ensure accuracy. All 49 advertisements contained VVR, but only nine advertisements also used VVR during the presentation of risk information. Because guidelines related to the dual modality in the presentation of side effects changed recently, only the advertisements that included VVR with the side effects

TABLE 1 Detailed and expanded codes used for transportation cues.

Transportation cue	Sub-cue	Definition	Example
Realism	Novelty	Unexpected Unique Innovative Creative	Split screen: on one side a person sick in bed/on the other a group eating out. The person sick in bed is able to view the group out eating, but they do not see her.
Vivid Cues	Sensory Appeal	Balance Pain Sight Smell Sound Taste Temperature Touch	Exemplars on a seesaw moving up and down. Large glass shards protruding from someone's arm.
	Vividness	Intense imagery	Close-up of exemplar Close-up of product
		Charts, graphs, simulated artist rendering	
		Vivid textual display on screen	Bright colors Large font
		Provocative or graphic imagery	A man sitting on a toilet with his shorts and underwear at his ankle.

were analyzed, and all of the information communicated by VVR in those ads was included.

Coding scheme for RQ3

In the NVIVO file with transcription, coders watched each scene, and highlighted and coded words that were spoken and appeared on the screen simultaneously. VVR from every ad was then transferred to a table in Word with four columns: the advertisement title; the narrated text (VVR); vividness of text in the VVR, and a still image of the VVR. The text's vividness was previously assessed in the codes for vivid images in RQ2 (i.e., colorful, bright, large, or close-up) and used to answer RQ3. Still images were snipped with a snipping tool the moment the narrator began to speak a word, or the moment that the entire phrase was spoken when there was more than one word.

Findings

RQ1: Visual narratives

All of the advertisements used visual narratives with clear messages that ended in wellness and health. The sample contained

TABLE 2 Realism: use of real actors or portrayal of symptom.

Ad title	Patient/consumer	Portrayal of symptom
Chantix Ginny	"Ginny quit smoking with Chantix"	
Chantix Mark's Dogs	"Mark quit smoking with Chantix"	
Cosentyx Feat. Cyndi Lauper	"Gary Actual Patient" "Cyndi Actual Patient" "Lauralee Actual Patient"	Cyndi Lauper shows psoriasis on arm
Cosentyx See Me	"Dana Actual Patient" "Kat Actual Patient" "Binh Actual Patient"	
Cosentyx Watch Me	"Mike Actual Patient" "Joni Actual Patient"	
Enbrel Feat. Phil Mickelson	"Phil Mickelson Pro Golfer Taking Enbrel for psoriatic arthritis"	
Eucrisa on Almost Everybody		Child (actor) with eczema on face being treated by parent
Eucrisa Steroid Free		Little boy with red patch on face
Harvoni Let Go	"Actual Patient Rebecca" "Actual Patient Rob"	
Humira Day at the Fair		Actor frantically searches for a bathroom at the fair
Humira Your Wake-up Call		Actor wakes up and rubs hands and feet
Keytruda It's True Donna's Story	"Donna is a real patient"	
Keytruda It's True Roger's Story	"Roger is a real patient"	
Latuda Maya's Story	"Maya's Story: About her bipolar depression" (identified as actor portrayal in lower left corner)	Actor sits alone in a studio speaking to camera while family plays in the background. She uses depressed facial expressions.
Linzess Yes		Actor is sitting on toilet with a painful expression on face
Lyrice Babysitter		Actor watches family play in backyard and rubs shoulder
Lyrice Coach		Actor sits in back yard and rubs shoulder
Lyrice Keep the Beat Going		Actor rubs his foot as if in pain
Rexulti Living Behind the Mask		Actor's facial expressions are depressed and she avoids eye contact with others
Taltz Touch Shows How We Really Feel		Actor has a red patch on the back of her elbow
Victoza Across the Country	"Jeff Iowa Managing type 2 diabetes with Victoza" "Luscetta Florida Managing type 2 diabetes with Victoza" "Melody Connecticut Managing type 2 diabetes with Victoza" "Shawn Utah Managing type 2 diabetes with Victoza" "Darla North Carolina Managing type 2 diabetes with Victoza"	
Victoza Feat. Dominique Wilkins	"Dominique Wilkins Basketball Hall of famer, Managing type 2 diabetes with Victoza"	

144 exemplars: 13% (19) exemplars in classic dramas and 87% (125) in 30 vignettes. The number of exemplars in the vignettes varied; the largest number of exemplars featured in a vignette was 8 and the fewest 2. Of the 144 exemplars, 74% (107) of them were asymptomatic and 37 began the ad symptomatic, but were asymptomatic by the end of the advertisement. The majority of the ads in this sample were vignettes with multiple narratives. Only 41% of the ads showed individual(s) whose health was restored after the intervention of the medicine (see [Figure 1](#)), and the remaining 59% began with a healthy and happy exemplar (see [Gilead Sciences, Inc., 2018, 00m:01s](#)). The latter strategy compels the viewer to infer that the medicine has been approved, consumed, and has worked.

The majority of the ads, 30 (61%), were vignettes with multiple exemplars and stories all of which culminated in a unifying message that the medicine restores health. For example, Entyvio, a medication for Crohn's disease and ulcerative colitis, features

several exemplars who are unable to participate in social events. The ad begins with different exemplars looking at their calendar/notes for an event they are uncertain they will be able to attend.

New exemplars are introduced in the advertisement that includes the scene of a woman visiting her doctor. The doctor's visit is the catalyst in the ad and all stories after that point show happy, energized, and socially involved exemplars.

The first scene after the doctor's visit shows a man sitting on a park bench looking at his phone. What he is looking at is not visible, but as his son (assumed) walks up behind him, it shows that he is seen purchasing tickets. The scene changes to the man and boy walking up the street, then toward the theater. Other exemplars appear in the remainder of the ad who are smiling and looking up or forward (see examples in [Table 3](#)).

Other visual narratives featured only one exemplar (37%) navigating a setting through an event or series of events (see

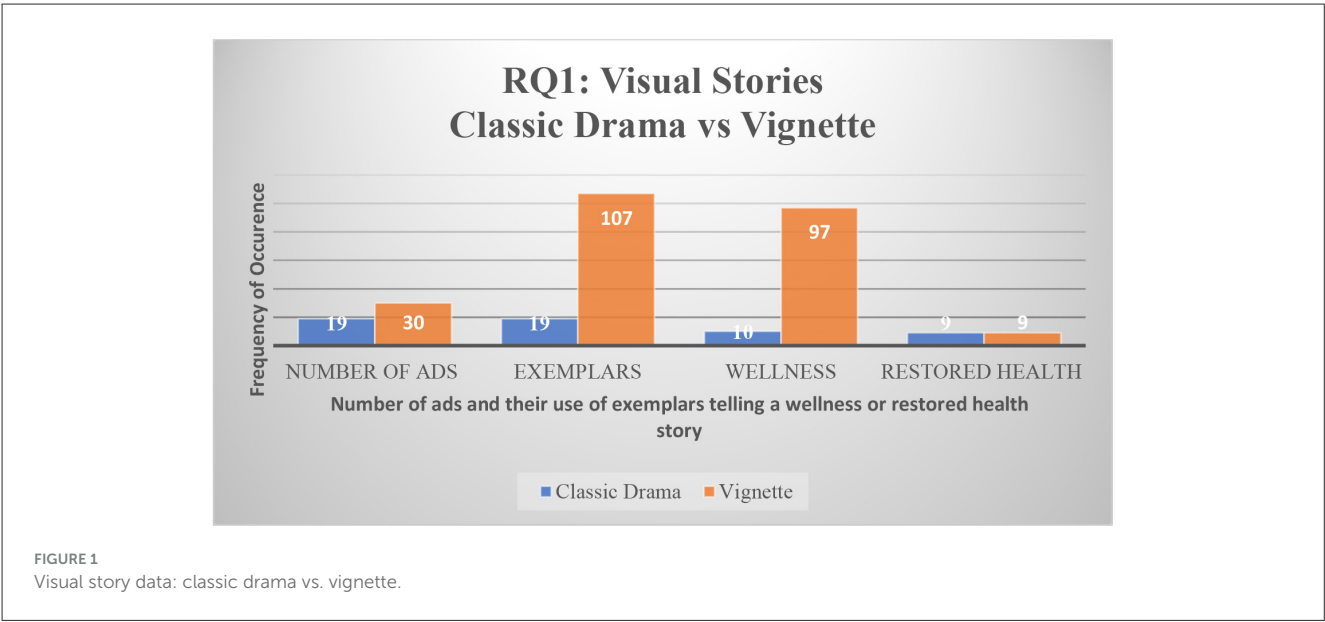


TABLE 3 Ad examples of multiple exemplars and medicine intervention, hyperlink to ad, and timestamp.

Product and manufacturer	Ad title and hyperlink	Screenshot examples	Location in video
Entyvio by Takeda (2018)	Entyvio - Time for a Change https://www.ispot.tv/ad/ImoV/entyvio-time-for-a-change	a) man sitting on couch looking at his phone b) close up of appointments on his phone	a) 00m:01s b) 00m:03s
		Woman shown sitting on exam table as doctor walks in	00m:14s
		Multiple scenes of father and young son together a) at a park b) looking at mobile tickets on phone c) walking down the street d) approaching theater	a) 00m:28s b) 00m:32s c) 00m:34s d) 00m:35s

TABLE 4 Ad example of one exemplar and medicine intervention, hyperlink to ad, and timestamp.

Product and manufacturer	Ad title and hyperlink	Screenshot examples	Location in video
Rexulti by Otsuka (2018) America Pharmaceuticals, Inc.	Rexulti - Living Behind the Mask https://www.ispot.tv/ad/dVEo/rexulti-living-behind-the-mask	Close-up of a photograph with the exemplar around friends, sad, and holding up a paper smiley face mask in hand	00m:01s
		Close up of multiple framed photographs of exemplar with others	00m:06s
		Exemplar talking directly to camera with paper smiley face mask in hand	00m:14s
		Exemplar in doctor's office with mask	00m:24s
		Exemplar putting mask in purse	00m:38s
		Exemplar at a restaurant with friends and no mask	01m:16s

Table 4). The exemplars in classic dramas are engaged in multiple activities throughout their day and 84% (16 of 19) engage in some sort of social activity with either family or friends.

unscripted, recognizable figures, interesting and innovative imagery, vivid colors, close-up shots, taboo glimpses into private moments, and a preponderance of intentional touch.

RQ2: Transportation cues

There were 794 transportation cues coded. They included realism that identified actual patients, scenarios that appear

Realism

Realism is a story's plausibility; it represents real people and real live events/situations. The dataset included 687 total scenes.

TABLE 5 Ad example of Novelty, hyperlink to ad, and timestamp.

Product and manufacturer	Ad title and hyperlink	Screenshot examples	Location in video
Breo y GSK (2016)	Breo - The Many Pieces https://www.ispot.tv/ad/A6pD/breo-ellipta-the-many-pieces	Close-up of exemplar from shoulders up; the scene is a jigsaw puzzle that comes together as she moves	00m:01s
		The ad progresses and reveals that she is at work. The puzzle is becoming more complete as it continues	00m:05s

The majority of the scenes, 570 (83%), were realistic in some way. They either identified the ad’s exemplar(s) as an actual patient(s), used celebrities who spoke about their experience, or showed an exemplar with a visible symptom (see Table 2). Other realistic situations showed events that were plausible and expected. All but two advertisements showed actors engaged in social experiences or recreational events. For example, in Otezla: Little Things Can Be a Big Deal, a woman has psoriasis, but is shown getting ready for a date and then driving her date to a craft fair in a convertible SUV.

Other realism in the advertisements included settings that seemed natural or scripted interviews meant to appear spontaneous, which contributed to the realism of the condition and benefit of taking the drug. For example, in the ad Chantix: Mark’s Dogs, Mark is being interviewed by a person off camera in what appears to be his home. He has quit smoking with the help of Chantix. Although the setting may be in a studio, he appears to be sitting on his couch. The view provides a peek into a realistic home environment and is believable; some of the elements that add to the perception of realism are the artwork, decorations, and the lamp illuminated in the background. Still image research uses the term image intentionality and explains that posed images are less transporting than naturally occurring images. Further, the visual narratives in these ads appear to be unscripted and occurring naturally.

Another realistic journalistic strategy is shown in *Jardiance: Good News*. In the advertisement, an actor poses as a journalist. It shows him approaching individuals on the street, with a film crew behind him, asking about their knowledge of Type II Diabetes (see Boehringer Ingelheim Eli Lilly, 2018, 00m:01s).

Novelty

Novel visual cues are interesting, engaging, and unexpected. There were 117 (15%) novel visual cues coded in 32 (65%) ads. Visual creativity contributes to novelty in the ads. Several ads were coded entirely as novel. One example is *Breo: The Many Pieces* ad, in which the entire ad is formatted like a puzzle, with pieces falling into place to create a partial scene (see Table 5). Each scene includes an incomplete puzzle, except for the scenes that picture the product and are either a completed puzzle (showing piece boundaries) or a regular picture (without piece boundaries). The emergent categories of novelty include animation, innovative scene presentation, camera shots and angles, image intentionality, and interesting imagery; it is explained further as animation used in an innovative way, animated images superimposed on part of an exemplar’s body, superimposed text over part of an exemplar’s

TABLE 6 Novel cues: category and limited examples.

Category	Example
Entire Ad	
Animation	Fish traveling through bloodstream.
Innovative scenes	Exemplar moves through different settings in seamless screen shots.
	Exemplar walks and makes stops in a city made of paper (except when she is home).
Intentionality	Docuseries format. Doctors present information on television. Exemplar watches in their television/device. Shots move between viewer and “live” session.
	Viewer positioned as bystander looking on as a journalist interviews random people on the street.
Camera shots and angles	Overhead camera shots, larger than life words superimposed on city walls, grounds, and buildings.
Interesting imagery	Puzzle pieces falling in place.
Scenes in ads	
Animation	
	Parts of body shown as if on an x-ray.
	Animated images or text superimposed on body of exemplar.
Camera shots and angles	
Close-ups	Objects (lanterns and toilet paper holder) and exemplar body parts.
Camera angles	First person views Angles that make the camera appear to be in motion with the exemplar (e.g., in front of exemplar and friends riding their bikes) Overhead angles: playing frisbee with friend, grilling with son, walking with friends, exemplar hands on pottery wheel.
Split screens	Exemplar on one side of screen and information, object, or contrasting setting on the other.

body, split screens with contrasting images, and various camera angles that add interest and perspective (see Table 6).

Vivid visual cues

Vivid visual cues are images that are powerful and emphasize elements in the ad. Over 83% (660) of text on the screen was vivid, showed close-ups of the exemplar, or contained vivid graphics (see Table 7). Vivid images that were not part of the narrative were interwoven seamlessly in the unfolding narratives. Taboo images

TABLE 7 Ad examples of vivid visual cues, hyperlink, and timestamp.

Product and manufacturer	Ad title and hyperlink	Screenshot examples	Location in video
Keytruda by Merck (2018)	Keytruda - It's True: Donna's Story https://www.ispot.tv/ad/w_y8/keytruda-its-tru-donnas-story-living-longer-is-possible	Exemplar looking in mirror, putting an earring in. The overlay is "A tru story" in vivid green text. The film (background) is black, white, and gray.	00m:06s
Harvoni by Gilead Sciences, Inc. (2016)	Harvoni - I am Ready https://www.ispot.tv/ad/ABl_/harvoni-i-am-ready	Close up of the side of exemplar's head.	00m:07s
Lantus by Sanofi (2018)	Lantus - Stay Together https://www.ispot.tv/ad/whrr/lantus-stay-together	Split screen with exemplar and significant other on side sitting on a car at the beach: the other side show \$0 copay	00m:10s

TABLE 8 Ad examples of sensory appeal (touch), hyperlink, and timestamp.

Product and manufacturer	Ad title and hyperlink	Screenshot examples	Location in video
Lantus by Sanofi (2018)	Lantus - Stay Together https://www.ispot.tv/ad/whrr/lantus-stay-together	Split screen with exemplar and significant other on side sitting on a car at the beach: the other side show \$0 copay	00m:10s
Entresto by Novartis (2016b)	Entresto - Tomorrow	Close up of exemplar washing shoulder	00m:11s
Chantix by Pfizer (2018)	Chantix - Ginny https://www.ispot.tv/ad/wpjO/chantix-ginny	Close up of exemplar's hand touching leaves on a tree	00m:25s

were used in scenes of exemplars sitting on a toilet, an intrusion into a private moment.

in the VVR was presented in larger fonts, but only when positive information was being shared (see [Sanofi, 2016](#), 01m:32s).

Sensory information

Sensory cues are images that appeal to the seven senses. There were 246 (31%) sensory codes. Touch was the only sensory appeal that was observed significantly, with 79% (194) instances (with temperature and pain included). Other sensory appeals included balance, sight, sound, and taste (all <1%). The majority were touch between individuals, but some included self-touch and object touch (see [Table 8](#)). In each of these advertisements, the touch is close to the center of the screen.

Visual-verbal redundancy

Four patterns emerged from the analysis of VVR in nine ads. First, the only one in which no active story appeared in the background was when the name of the drug or positive information was presented ([Sanofi, 2016](#), 01m:32s). Second, all presentations of side effects or risks were visible at the bottom of the screen and in small fonts (see [Novartis, 2016a](#), 00m:30s). Third, when the side effect information was presented, a vivid transportation cue was also used (either a close-up, a new exemplar, or new idea emerging). For example, in the Fasenra advertisement, the entire ad was set up as if doctors are presenting a session at a workshop. The scenes shifted back and forth between the doctors' "live" presentation to the same doctors and conference being broadcast on a television. In the advertisement, at the onset of the presentation of side effects, the scene changes to a man and woman watching the "conference" on their tablet. Not only does this act as a transportation cue, but it also requires the actual viewer to infer that the acting couple is watching the conference (see [AstraZeneca, 2018](#), 00m:27s). Last, information

Discussion

This research contributes to ongoing discussions about the visual stories used in pharmaceutical advertisements. The FDA responds to concerns that background images during the communication of risk information may hinder consumers' attention and understanding. However, research on the distractions through the use of transportation cues and visual narratives throughout DTCAs should be expanded. This research offers the first close inspection of visual narratives in DTCAs that provides insight into specific choices and strategies that pharmaceutical advertisers use to sell their medicines, as well as a greater understanding of those strategies. Cues, such as those identified in these advertisements, may be persuasive because they increase the product's credibility, reduce or disable critical processing, distract from counterarguing, and use strategies to increase comprehension and recall.

Visual stories about health in DTCAs

The visual stories in these advertisements predominantly communicated positive information about using the drug advertised. First, the majority of advertisements used multiple exemplars, which contributed to a collective perception of the drug's effectiveness. Moreover, all of the advertisements ended with messages of wellness and the majority of visual narratives began with wellness stories. Thus, the ads began with a healthy and fully functioning exemplar. These wellness stories presented

TABLE 9 Transportation cue frequency.

Code	Visual frequency	Number of ads that use the cue
Novelty	117	32
Vivid imagery	397	46
Vivid text on screen	263	46
Charts, graphs, or simulated drawings	17	13
Visual and verbal redundancy	479	49

the exemplars going through their daily routines unimpeded by a health issue. Many of the narratives implied that the medicine had been taken at some point in the past because the exemplar was shown to have no symptoms. Cohn (2019) explained that viewers use bridging inferences to fill in gaps based upon current, as well as prior, information. Petty and Cacioppo (1986) stated that prompting an individual to make inferences about content is an effective persuasive strategy.

The remainder of the stories about health involved restored health after an intervention with a doctor or medicine. Restored health stories also rely on inference. The chronology in these scenes shows an unhappy, struggling exemplar, while the climax to the stories develops with a doctor's visit or a screen shot with the name of the drug in the scene. Thereafter, the exemplar is no longer symptomatic and is shown living a life unhampered by the woes that they experienced previously. The viewer is once again encouraged to infer that the medicine is the catalyst. These positive visuals create a distraction that uses the cognitive resources necessary to make critical judgments and assessments (see Niederdeppe et al., 2012; Petty and Cacioppo, 1986; Rubinelli et al., 2008; Shapiro and Kim, 2012). They also imply that the medicine is the means to achieve good health. Lastly, the preponderance of positive information throughout indicates a gross imbalance between the benefits vs. risks of using the product, in direct violation of FDA regulations of adequate provision.

Transportation cues

Isolating the transportation cues allows the nuanced details included in these ads to be examined closely. Transportation cues such as realism, novelty, and vividness are constructed to captivate viewers' attention. Transportation into the narrative through these persuasive strategies can result in more positive perceptions of the ad and brand, and more favorable emotions about the drug advertised. In addition, the same strategy used to transport viewers into a narrative can result in disengaged critical evaluations and fewer counter-arguments (Ching et al., 2013). There were several clear cues present in the ads analyzed (see Table 9 for cue frequency).

Realism

One theme that emerged was documentary style advertising. Several of the advertisements used a realistic, seemingly unscripted,

strategy in their format, or added visual text that either indicated that the exemplar was an actual patient or showed a well-known person who served as the spokesperson for the medication (i.e., Cyndi Lauper). Similarly, the advertisements presented the stories and actors in typical daily activities, as if the moments were captured candidly on film.

This blurs the line between reality and fiction, increases the credibility of the drug advertised, and showcases the medicine's benefits. Advertisements that are framed as editorial inquiry raise serious ethical questions; this approach implies the medicine's effectiveness in association with a respected field. It is also misleading because it implies that real-world sufferers have alleviated their health problems by using the medicine, with recovery showing that the claims of the drug's benefits are reliable and truthful. Broadly, it implies that the claims are truthful, which increases the advertised drug's credibility, regardless of whether they are proven empirically.

Vivid imagery

The transportation cue used most frequently was vivid cues. Advertising literature addresses the persuasiveness of vivid cues and their effect on viewers. They demand attention and engage viewers emotionally. In addition, vivid cues in transportation increase engagement and arouse curiosity. Engaged viewers are more likely to believe messages when cognitive resources are disabled by the engaging content (Slater and Rouner, 2002) and advertisements are viewed more positively when compelling visuals and sensory information are used (Cho et al., 2014). There were numerous engaging, shocking, and attention-attracting cues in this dataset. Sullivan et al. (2021) found that positive information increases the perceptions of a drug's efficacy. The various strategies, such as close-ups, distinct colors, and beautiful imagery, are vivid cues intended to draw attention. These contribute to the realism of the advertisement, which influences the perception of the ad and the drug overall.

Touch

Touch was another vivid transportation cue used predominantly. Imagery that evokes the senses creates a positive impression about the brand and increases persuasion (Haase et al., 2020; Roose and Mulier, 2020; Yoon and Eun, 2012). For example, the *Chantix Ginny* ad for smoking cessation shows a close-up of the actor touching a tree. The connection between smoking cessation and touching the leaves of a plant, which produce clear, fresh air, and replace the cigarette in the exemplar's hand, has to be inferred. Similarly, sensory marketing research is clear that evoking the senses through imagery increases behavioral intentions and perceptions about a product.

Visual and verbal redundancy in DTCA's

Although VVR includes audio components, it does serve as a transportation cue. The combination of bright colors, large fonts, and strategic placement of the visual text, as well as the audiovisual effects make it a vivid element in an

advertisement. The positive vs. risk information is not balanced in the VVR portions of the ads. Information that is both seen and stated audibly increases learning, memory, and comprehension (Adesope and Nesbit, 2014). Therefore, the abundance of positive information in the ad, the repetition of the drug's name in vivid colors or size, contributes to the dominance of alleged positive information over the risks. As new regulations are mandated, future research should expand to all VVR included in DTCAs.

Conclusion

This research is the first to explore specific visual transportation cues exclusively in DTCAs. It expands research that Ball and Applequist (2019) began and contributes to ongoing work by providing a template for future research that may include the isolation of variables to inform participant engagement. It also increases media literacy, which may help improve the way that information is presented to the consumer and enhance communication between physicians and patients. The FDA is working continually to assess the balance of negative and positive content and to identify and interpret the persuasive strategies used in DTCAs. These findings indicate that the DTCAs studied do not draw attention to the side effects of the medicine, but instead highlight the positive aspects. These results can serve as a useful tool to inform compliance to FDA regulations.

Limitations and suggestions for further research

The most obvious limitation of this research is that the advertisements in this dataset are from 2016 and 2018. Several years have passed and many events have transpired since these DTCAs were created and broadcast. In addition, the FDA has implemented new guidelines with respect to the balance of benefits vs. risks of using a drug. Nevertheless, similar strategies can be applied to newer DTCAs and then compared to this body of work to obtain valuable information about any changes made in the interim. Such comparisons can provide insight into adhering to policy as well as monitoring changes in the pharmaceutical marketing industry.

All of the advertisements had an emergent and ongoing narrative while communicating the risk information. Studies should be conducted to compare the participants' understanding of risk information in ads that include an ongoing narrative vs. no ongoing narrative during the presentation of risk information. Future research should collect DTCAs from an entire season of a program, and new DTCAs that have been submitted to the FDA for approval should be assessed using the strategy applied in this research. Further, the analysis of VVR information is limited, and should be expanded to include a larger sample of advertisements. However, it is important to examine areas of VVR other than just the risk communication, as they convey positive information about the medication.

Research should expand VVR frequency and categories in DTCAs, considering FDA regulations. Most importantly, the effects of transportation cues and VVR use in DTCAs, should be studied through research that tests participants' perception, memory, and recall. Transportation cues such as touch, novel visual cues, and vivid imagery in more recent DTCAs should be isolated, manipulated, and used as variables in research to determine their effect on patients'/consumers' behavior.

Data availability statement

The raw data supporting the conclusions of this article will be made available by the authors, without undue reservation.

Ethics statement

Written informed consent was not obtained from the individual(s) for the publication of any potentially identifiable images or data included in this article because the images are from advertisements that were broadcast on the major networks and on popular cable television.

Author contributions

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