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How the Persuasive Narrative of Cells at Work! Impacts Health Education

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Abstract

The ongoing Japanese manga-turned-anime series Cells at Work! recounts stories of anthropomorphized cells within the human body. This analysis examines how the series' narrative structure, although intended for entertainment, promotes health education and awareness by leveraging the Transportation-Imagery Model. The author further discusses the continued impact of Cells at Work! on worldwide health education, including COVID, communicable diseases, and general self-care.

Introduction

Twentieth-first century health education has transitioned from medical professionals reactively managing communicable diseases, to educated individuals proactively preventing the spread of illness through behavioral change. To combat diseases and maintain a healthy society, established health treatments and public policy changes must involve individuals taking personal responsibility for their health (Koelen & Van den Ban, 2023). Clear and accurate health information, presented to specific populations, helps facilitate gradual behavioral change and bolster community health. However, barriers such as literacy level and access to health education initiatives may render these efforts ineffective for specific individuals and populations (Nutbeam, 2000). Furthermore, health education delivered in uninspiring or traditional ways often fails to facilitate engagement or lead to action (Carpena, 2024).

Philosopher John Dewey (1902) challenged educators to create engagement through entertaining learning, a concept later coined "edutainment" by Peter Catalanotto (New World Encyclopedia, 2024). Edutainment media encompasses films, books, television, video games, virtual reality, and other entertainment mediums (Wallden & Soronen, 2004). Whether as a classroom lesson or public service announcement, edutainment media aims to provide an amusing educational experience. In health education, edutainment offers an accessible, informational, and engaging method

for spreading vital information to target audiences. Powerful stories featuring interesting characters can help challenge social norms and superstitions related to healthy behaviors (Dzinamarira et al., 2022). Furthermore, edutainment's low literacy barrier—often relying on moving visuals and spoken language—reaches wider audiences than traditional pamphlets, textbooks, and billboards (Wang et al., 2019).

Edutainment's goal is to increase information retention and evoke behavioral change. However, because of its persuasive intent, edutainment often prioritizes education over entertainment. As a result of this explicit approach, edutainment may appear manipulative—information masquerading as lackluster amusement—to the consumer, leading to engagement resistance (Bilandzic & Busselle, 2019). This resistance reduces the likelihood of behavioral change and information retention. Despite these challenges, case studies exist of successful edutainment experiences that facilitate behavioral change by immersing consumers in an emotional narrative. The Japanese series Cells at Work! successfully leverages edutainment through its persuasive narrative that raises health and wellness awareness within the individual consumer and their community.

Narrative Structure and Components

Cells at Work!, a Japanese manga-turned-anime, was first serialized in 2015. With over 1.5 million copies in print (Komatsu, 2018), the series continues to publish spin-offs inspired by the original title's success. Cells at Work! chronicles episodic misadventures of anthropomorphized cells battling against maladies in the human body (Kenichi, 2018). The White Blood Cell, for example, is portrayed as an assassin, while the Killer T cell evokes military-like discipline. Antagonists include viruses, bacteria, and injuries to the body, visually portrayed as zombies (infected cells), insects (parasites), and monsters (viruses).

Through a combination of humor and visual metaphors, Cells at Work! manages to entertain while memorably disseminating information. For example, episode 5, "Cedar Pollen Allergy," vividly portrays the comedic chaos that ensues when the body's Memory B-Cell (responsible for retaining information about pathogens and how to destroy them) overreacts to an otherwise harmless trigger (Kakihara & Ōsedo, 2018). Memory B-Cell, portrayed as an anxious doomsday prophet and forgetful record-keeper, declares Armageddon when cedar pollen particles (portrayed as harmless, mindless blobs) invade the body. His ravings lead B-cell to blast the allergens with his antibody gun, causing Mast Cell to release excessive histamines in response, resulting in a severe allergic reaction that wreaks havoc on the cells' city. As the cells begin blaming each other for the chaos, a steroid (portrayed as a non-anthropomorphic robot) arrives, annihilating both the cedar pollen and the environment while the cells run for cover. The episode ends with a regretful Memory B-Cell promising (in vain) to remember this incident for next time.

This illustration serves as one example of how Cells at Work! conveys complex biological concepts by anthropomorphizing inhuman lifeforms and creating amusing narratives surrounding their biological processes. While being entertained and absorbing health-related information, the consumer also learns about the biological consequences of their actions on their bodies; as portrayed in "Cedar

Pollen Allergy," for example, taking a steroid successfully alleviates the allergy but also causes indiscriminate harm to the body's cells and structure. As a result of watching this episode, the consumer may feel more informed about proper medicinal steroid use or seek alternative remedies.

Therefore, in addition to informing the consumer about biological processes, Cells at Work! quietly confronts its audience with responsibly owning their health. Fatalism lies behind the series' colorful, gag-heavy veneer. The cells' body seems unaware of their existence, and its interior often resembles a warzone. This structure places the consumer within the narrative, inviting them to consider the ramifications of their actions on their body. The resulting narrative frames health and wellness as a collaborative effort, as cells fight for the body's sake but require the body's support to succeed. For example, in the episode "Acquired Immunity," the cells successfully prevent an invasion of the Mumps virus only due to the body's previous immunization (Kakihara & Chiba, 2021). The series makes no explicit monologues regarding health and wellness, but rather—through its overarching story—implicitly persuades consumers to consider their impact on their own well-being (Bilandzic & Busselle, 2019). The Transportation-Imagery Model presents one methodology for understanding how Cells at Work! facilitates behavioral change by evoking emotional responses from its consumers.

Transportation-Imagery Model and Persuasion Effect

The Transportation-Imagery Model posits that meanings encoded within images can persuade consumers, especially when combined with emotional content (Green & Brock, 2002). When the narrative experience successfully immerses the consumer, their argumentation becomes inhibited, making them more receptive to the narrative's message (Bilandzic & Busselle, 2019). Imagery serves as an effective persuader because the mind recalls the emotions attached to the image rather than counterarguing its logic (Mazzocco & Brock, 2006). Cells at Work! leverages narrative structure, sympathetic characters, emotional scenarios, and vivid imagery to add persuasive leverage to its health education messaging.

Persuasive Education

Stories prove especially effective as educational devices; compared to textbooks written in abstract concepts, stories create a narrative web of associations between images, characters, facts, and feelings, making them easier to recall (Schank & Berman, 2002). The author and illustrator of the Cells at Work! manga, Akane Shimizu, first conceptualized the idea to help her younger sister comprehend high school biology homework (Konomanga.jp, 2016). Medical school students have also testified to the story's benefits, praising its ability to simply convey complex medical concepts with definitions that match their textbooks (Karim, 2021). Beyond classroom learning, health edutainment can leverage narrative structure to model healthy behaviors while appealing to specific subgroups (Hinyard & Kreuter, 2007).

Globally, anime continues to gain popularity beyond its dedicated fanbase. In 2021, Netflix, which has streaming rights to Cells at Work!, reported that 90% of its Japanese viewers and over 50% of its 219.7 million global viewers watched anime (Ramachandran, 2022). However, the anime industry

appeals most strongly to its dedicated otaku subculture, which is comprised of fans of Japanese media and storytelling. Cells at Work! uses visual and narrative tropes familiar to otaku, such as its moe-style (or cute girl-style) Platelet characters or its traditional "credits running sequence" which plays at the end of each episode. Due to a receptive frame tied to the otaku's self-concept, Cells at Work! can serve as experiential learning that effectively communicates health concerns and leads to behavioral changes (Comello & Farman, 2016).

Studies in experiential learning have correlated changes in otakus' self-concepts with anime characters' modeled behaviors, such as learning the Japanese language (Khumaeroh et al., 2023) or building psycho-social resiliency (Migliorino-Reyes, 2020). Therefore, it is reasonable to assume that anime characters modeling healthy behaviors, like those depicted in Cells at Work!, may increase awareness of and desire to emulate those healthy behaviors. In an anecdotal testimonial titled "How Cells at Work! Taught Me to Embrace Self-Care," one otaku reflects how the series made her realize she was "the mother or caretaker to all of these little [cell] beings" and wanted to "provide a safe home and a good working environment so all of my cells could do their jobs," causing her to "eat, exercise, hydrate, choose healthy coping mechanisms and refrain from self-mutilation" (M, 2021).

Transportation through Emotional Design

Emotional design in edutainment is the process of leveraging design elements to evoke experiential feelings that shape consumers' thoughts or behaviors (Antonio, 2016). Aesthetic design, emotional images, color palettes, sympathetic characters, and narrative mood provide motivational cues that guide consumers' feelings toward the experience (Chung & Cheon, 2020). To successfully transport consumers into its narrative, Cells at Work! provides vivid depictions of health issues and their emotional impact on the body's cells, prompting self-reflection. For example, in episode 11, "Heat Stress," the body experiences heatstroke, which exhausts the cells and leaves them nearly defenseless against heat-resistant bacteria; with all hope lost, a fluid injection saves the despairing cells from burning alive in an apocalyptic wasteland, allowing them to defeat the bacterial invaders (Kakihara & Kubo, 2018).

Aesthetically, each cell's visual design symbolizes its biological functions and conveys emotional relatability to the consumer. For example, the Macrophage resembles a motherly maid with a giant blade; this symbolizes her biological role as a dead cell cleaner, virus attacker, and differentiator of young erythroblasts in the body's bone marrow (young red blood cells gather around the macrophage, as children would a mother). Anthropomorphizing educational concepts, such as the macrophage, is a form of emotional design that increases learning and engagement with the academic material (Liew et al., 2022).

Furthermore, Cells at Work! leverages emotional design by creating relatable characters with interesting histories. Red Blood Cells, for example, are depicted as naïve mail couriers who transport oxygen to cells' apartments; however, their inability to protect themselves makes every day on the job anxiety-inducing. White Blood Cells, meanwhile, are action-hero archetypes who struggle to maintain their arduous work-life balance as they monitor against continuous threats (much like a real-life EMT or

police officer). The characters bond and grow from their experiences with each other, and some have detailed backstories involving insecurity, pathogen attacks, and unlikely friendships with other cells. These storylines transport consumers into the narrative as they empathize with the characters' relatable and intriguing struggles (De Graff et al., 2012). As a result, the consumer feels a deeper emotional investment in the cells' well-being.

The series' emotional design reaches a climax in the season one finale, "Hemorrhagic Shock," in which the cells struggle to deliver life-saving oxygen to the brain, nearly freezing to death in mass hypothermia until a transfusion delivers additional Red Blood Cells to help (Suzuki, 2018). Through its cycle of episodic, dystopian calamities followed by hard-fought victories through cooperation, Cells at Work! paints a hopeful picture—empowering its viewership to proactively take ownership of their health for themselves and their community (Iwasaki, 2021).

Persuasive Impact on Health Awareness and Initiatives

The global success of Cells at Work! has inspired numerous independent and officially sponsored health campaigns. Endorsements by medical professionals have credited the series' accurate portrayal and simplification of complex microbiological concepts (Fobian, 2018; Dr. Hope, 2018; Valdez, 2018). Cells at Work! topped China's most-watched cartoons in 2018 with over 56 million views on Bilibili, as teachers assigned the show as homework (Shen, 2018). Furthermore, empirical evidence supports Cells at Work!'s effectiveness as a form of health education. A study of 134 biology students found that, compared to peers learning the same information through traditional slideshows, students who watched Cells at Work! not only felt more motivated and less distracted during learning but also retained the information better during follow-up tests (Mahler & Mayer, 2024). A second study, conducted among Indonesian students, found that watching Cells at Work! improved post-test exam scores related to the body's immune and circulatory systems (Alfina et al., 2024).

Japan's Ministry of Health, Red Cross Japan, and Japan's National Center for Global Health and Medicine have leveraged Cells at Work! to promote numerous health campaigns. These include a blood drive targeting over 15,000 doners (Luster, 2020), an AMR Awareness Month distributing over 137,000 leaflets (Laforteza, 2021), and a special manga and animated chapters regarding COVID prevention translated into Japanese, English, and Hindi (Honey's Anime, 2021; Takada, 2021). Additional initiatives have included preventing heat stroke (Morrissy, 2019), raising awareness of cold symptoms (Loveridge, 2020), and managing the spread of airborne germs (Loveridge, 2018).

These health campaigns have an inherent advantage due to the consumer's established attachment to Cells at Work!. Seeing the series linked to a specific cause, similar to a celebrity endorsement, fosters an emotional response and creates a persuasive impulse to support the promoted health initiatives. Furthermore, fictional characters may be more effective endorsers than real-world celebrities due to their lack of negative associations (Kennedy et al., 2019). This effectiveness also results from Cells at Work! having an intrinsic persuasive message told through its overarching story; if these same health campaigns created anthropomorphized characters solely to promote their efforts,

this explicit messaging might create resistance rather than engagement in the consumer (Dal Cin et al., 2004).

Challenges and Limitations

Although empirical studies, medical professionals, and anecdotal testimonials advocate for the effectiveness of Cells at Work! as a health education tool, the series contains notable limitations. Audiences may find that the frequent narrative-style presentation of scientific information slows the pacing of the story's action, temporarily breaking immersion in the story (Silverman, 2016). Furthermore, Cells at Work! contains frequent displays of bloodshed and some unsettling images that may make it inappropriate for younger audiences (Wolf, 2020). Most notably, the Chinese government initially banned the series for its violence, later airing a censored version after evaluating its public health education benefits (Zuo, 2021). Specific spin-off series of Cells at Work!, such as Cells at Work! Code Black and Cells at Work! Lady, feature an adult rating and contain mature topics inappropriate for a general audience (Cintya et al., 2021). Furthermore, the series' anime style may be considered unattractive by audiences uninterested in the medium or unfamiliar with Japanese storytelling tropes and archetypes.

Conclusion

By creating an emotionally engaging narrative filled with striking visuals and memorable characters, Cells at Work! succeeds in both educating and persuading its consumers to reflect on their wellness and obligation to maintain a healthy body and community. Previous studies correlate viewing edutainment series, such as Cells at Work!, with increased retention, interest, and attention compared to traditional teaching methods. However, future research should investigate the persuasive effects of edutainment anime versus non-anime edutainment on the otaku subculture compared to the general public.

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