COMMUNICATION & SOCIETY

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Is It Real Enough? A Mixed-Methods Study of Realism, Engagement and Counterargument in Transmedia Edutainment for Sustainable Behaviors

Abstract

Advancements in technology have driven media convergence, paving the way for innovative storytelling formats like Transmedia Edutainment (TE-E), a new promising strategy for advocating prosocial behaviors. However, there is limited research on narrative processing and the persuasive outcomes of TE-E, particularly in environmental contexts. Therefore, this paper examines TE-E as a new communication strategy that leverages storytelling across multiple platforms to promote pro-environmental messaging. Drawing on entertainment-education literature and narrative persuasion theories, specifically the narrative engagement model and perceived realism as theoretical frameworks in this study, to help understand the role and influence of TE-E. Using a mixed-method design, five focus group discussions were conducted with college students to gain deeper insights into their attitudes and impressions towards TE-E. Additionally, an online experiment with (N=441) college students examined the role of perceived realism, narrative engagement, and counterargument, as message mechanisms responsible for promoting pro-environmental behaviors. Thematic analysis of the focus groups discussions revealed two emerging themes: (1) "The triple R effect of TE-E" and (2) "Is it real enough?" The experiment shows that the counterargument plays a key role in understanding and shaping the message mechanisms of TE-E. Results found that TE-E successfully encourage adopting sustainable behaviors and directly reduces counterarguments. However, it had slightly lower perceived realism compared to the video, leading to reduced narrative engagement. Overall, this paper contributes to the expanding literature on TE-E within the context of environmental communication. Practical implications for message development and environmental advocacy are also discussed.

Keywords
Transmedia, edutainment, sustainable development, narrative, realism, engagement, counterargument, pro-environment behaviors.

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1. Introduction

Advancements in digital media and technology have inspired new forms of communication and storytelling, such as Transmedia Edutainment (TE-E). Emerging from Entertainment-Education (E-E) or Edutainment, TE-E is a creative storytelling approach that embeds educational messages in entertainment narratives by leveraging the power of storytelling across multiple platforms to raise awareness, challenge social norms, advocate for social change, and encourage prosocial behavior (Hancox, 2017; Lutkenhaus *et al.*, 2022). However, traditional E-E focuses on a single narrative in a specific medium, such as radio or TV, while TE-E engages the audience through several stories expanded across multiple media platforms over an extended period of time. For example, Wang and Singhal (2016) examined *East Los High*, a TE-E that promoted sexual and reproductive health among young Latino/as using an online drama series, vlogs, narrative extensions, interactive website, and social media, and found that it encouraged the use of testing/pregnancy services.

A growing body of literature suggests that TE-E is a promising strategy for driving social change by promoting prosocial and environmentally responsible behaviors (Heilemann *et al.*, 2017; Lam & Tegelberg, 2019). However, past research was primarily observational and focused on transmedia development and did not empirically examine the impact on behavioral outcomes or its persuasiveness (Miranda-Galbe *et al.*, 2021), especially in an environmental context. Thus, we draw on health communication literature that found empirical evidence of the positive impact of transmedia on behavioral outcomes (Wang & Singhal, 2016). Furthermore, while much of the transmedia research has been descriptive (Gambarato & Medvedev, 2017) and focused on the creators of transmedia (Thon, 2019) or on semiotics (Scolari, 2013), this study shifts the focus to the receivers of transmedia to investigate its effectiveness in motivating individuals to adopt environmental behaviors.

This study focuses on the United Nations (UN) Sustainable Development Goals (SDGs) because they developed a TE-E across multiple platforms, such as videos, game, and comic, to promote the SDGs among young adults, encourage pro-environmental behaviors and to address global challenges like climate change and pollution. This study specifically targets Generation Z (Gen-Z) who represents the future of our society, are the driving force behind supporting SD (Fabbrizzi *et al.*, 2016), and the most impacted by sustainability concerns and resource availability and they are more focused on issues related to social and environmental justice (UN, 2018). Research evidence indicates that a multiplatform approach is effective in reaching Gen-Z, who are digital natives raised on consuming multiplatform communications such as *Matrix*, *Star Wars*, and *Harry Potter* (Parker & Igielink, 2020).

Recent evidence suggests that narratives are more effective than traditional persuasive messages in promoting prosocial behaviors (Carcioppolo *et al.*, 2021; Oschatz & Marker, 2020), as they arouse less resistance by using engaging content that subtly influences the environmental thinking, attitudes, and behaviors of Gen-Z (Moyer-Gusé, 2008). Thus, this study builds on narrative persuasion theories to explore TE-E's narrative mechanisms and outcomes through a mixed-method design. Specifically, it conducts focus groups to explore Gen-Z' impressions and attitudes toward the UN's TE-E pro-environmental messaging, and an experiment to examine the persuasive effects of TE-E, with a focus on the role of narrative engagement and perceived realism as key persuasive mechanisms.

2. Literature Review

2.1. *Transmedia Edutainment, Narrative Persuasion, and Prosocial Behavior*

The narrative persuasion paradigm, pioneered by Fisher (1985), postulates that meaningful communication occurs via storytelling, as humans, by nature, are storytellers. Fisher argues that stories are more persuasive than logical/rational arguments because they engage listeners in the story by subtly presenting arguments and allowing them to be part of it. Unlike traditional

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persuasion, which explicitly sells an idea or directly influences an individual to do something, the narrative uses a subtle form of persuasion to communicate messages by *engaging* the audience with the content and making them feel *connected* with the narrative by *identifying* with the characters in the story, and make the content relevant and *real*, which reduces *resistance* to messages and becoming more accepting to it (Moyer-Gusé & Dale, 2017). Thus, engagement, realism, identification, and counterarguments contribute to narrative persuasion by affecting beliefs, attitudes, and behavioral intentions (Fitzgerald & Green, 2017).

A recent meta-analysis found that narrative-based messages have a more persuasive impact than non-narrative messages on attitude and behavioral intentions in the short and long term (Oschatz & Marker, 2020). Furthermore, past research has shown that narrative appeals can effectively affect an audience's perceptions, attitudes, and behavioral intentions (Braddock & Dillard, 2016). For example, a narrative episode called *Roes* had a positive impact on discouraging binge drinking among adolescents (van Leeuwen *et al.*, 2017).

Similarly, transmedia edutainment relies mainly on narrative for communication and persuasion. Narrative persuasion works in a TE-E by subtly embedding educational messages in entertainment narratives and offering a multilayered approach to storytelling across multiple communication platforms that make the narrative stronger and more compelling. It also employs story extensions or adaptations across platforms that engage the audience in different ways, intensifying the depth of the experience and deepening the relationship with the characters and the story plots (Sangalang *et al.*, 2013; Wang *et al.*, 2019). For example, a social activism TE-E project called *Collapsus* integrated stories across newscasts, interactive maps, and video blogging, which succeeded in changing citizens' thinking and behavior regarding the global energy crisis (Von Stackelberg & Jones, 2014).

The multiplatform narrative approach differs from past communication interventions that focused on a single platform advocating pro-environmental issues and found modest outcomes (Fabbrizzi *et al.*, 2016). For example, past research that examined young adults' reception of videos with environmental narratives found only limited behavior change (León *et al.*, 2021; Moyer-Gusé *et al.*, 2019). Alternatively, the impact of a narrative simulation game on poverty did not yield supportive attitudes compared to the control group (Roussos & Dovidio, 2016). On the other hand, using narrative across multiple media platforms was common among successful initiatives. For example, *Catalina*, a mental health transmedia narrative intervention for Latinas with depression, led to behavioral change. It was able to encourage them to get help, increase their levels of self-efficacy, reduce symptoms of depression and anxiety over time, and encourage public debate and spreading the TE-E among their social circles (Heilemann *et al.*, 2017). Also, *East Los High*, a TE-E that promotes sexual and reproductive health among young Latinos, encouraged audience engagement and exhibited high levels of knowledge gain and intentions to use testing and pregnancy services (Wang & Singhal, 2016). Thus, the following is proposed:

H1. Exposure to the UN TE-E narrative generates high levels of knowledge and pro-environmental behavioral intentions towards SD compared to single narratives.

Nowadays, with the plethora of media platforms, the audience is fragmented across various media channels, thus the TE-E takes advantage of spreading the narrative across multiple platforms to reach the audience (Lutkenhaus *et al.*, 2019). Since the transmedia approach is more effective for targeting Gen-Z, who grew up consuming transmedia and are most impacted by sustainability or resource availability (Parker & Igielink, 2020), the following research question is proposed:

RQ1. What are Gen-Z's impressions and perceptions of transmedia and their attitudes towards the UN transmedia edutainment for sustainable development?

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2.2. *Narrative Engagement and Perceived Realism*

TE-E utilizes storytelling and narrative structures to persuade the audience by drawing on different theories of narrative persuasion that induce changes in the audience's knowledge, attitudes, and behaviors (Fitzgerald & Green, 2017). For example, Busselle and Bilandzic (2009) proposed a model of narrative engagement to understand narrative processing and the mechanisms responsible for narrative outcomes, which can help to understand narrative persuasive outcomes of a transmedia campaign. They argue that narrative engagement suggests that the more one becomes engaged in a narrative, the more likely to affect story-related attitudes and predict enjoyment.

Miller-Day and Hecht (2013) argue that the core element of narrative is the ability to engage an audience with narrative messages to understand message effects and behavioral change. They introduced the narrative engagement framework, which asserts that it is an essential component to understanding narrative message effects and encourages an audience to enact certain behaviors. Miller-Day and Hecht explain that narrative has four elements: interest, realism, identification, and transportation; the greater the interest, realism, and identification, the greater the persuasive effects, whereas transportation is a curvilinear relation. They suggest two types of involvement with narrative: involvement with the plot (realism) in that the audience disengages if the message is perceived as unrealistic, while (identification) is involvement with characters.

Busselle and Bilandzic (2008) proposed a theoretical framework explaining that perceived realism, the perception of a story's 'realness,' is a key component of the narrative message that intensify media effects, message authenticity, and emotional involvement, thereby facilitating greater narrative engagement. They argue that any violations of realism or the mental process of constructing a model of the narrative world can disrupt absorption or engagement with the narrative and lessen its persuasive power. An experiment was conducted and found that realism positively influences narrative engagement (Bilandzic & Vierrether, 2022).

Busselle and Bilandzic's framework (2008) explain that inconsistencies in realism in the form of divergence from the actual world can trigger counterarguing if there is no story logic behind it, thereby reducing the engagement experience. Cho *et al*.'s (2013) experiment confirmed that stronger realism could mitigate message minimization and counterarguing. Similarly, Dahlstrom (2015) also asserts that realism results in overall message acceptance, thus reducing message resistance. Van Leeuwen *et al*. (2013) emphasized that realism can influence narrative involvement and engagement because it is associated with narrative enjoyment. Similarly, Ji and Raney (2016) further demonstrated that realism predicted the emotional aspects of narrative involvement. In the case of interactive narratives like transmedia, it can have a stronger effect on pro-social behaviors because they require active user engagement rather than passive exposure to the narrative. Thus, the following hypotheses are proposed:

H2. Exposure to UN TE-E would lead to higher (a) perceived realism and (b) narrative engagement compared to a single medium.

H3. Perceived realism in the UN TE-E will mediate the relationship between conditions with a) counterargument and b) behavior intentions.

H4. Perceived realism in the UN TE-E will mediate the relationship between conditions with a) narrative engagement and b) behavior intentions.

3. Methodology

This study used a mixed-methods design to enhance the breadth and depth of the research inquiry, responding to the lack of literature on TE-E in environmental context and the growing need for evidence-based research (Heilemann *et al*., 2017; Sangalang *et al*., 2013). The combination of quantitative (experiment) and qualitative (focus group discussions) methods allows for a more nuanced understanding of the narrative mechanisms and effects of TE-E, with each method complementing the other to better explain the results (Morgan, 2019). The study

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began with the qualitative method, which included five focus groups, each with 4-5 participants, totaling 21 individuals, then followed by quantitative method involved an experiment with 441 participants. Although the participant samples for each method were different, both targeted Gen-Z college students aged 18-24 in the United States, ensuring demographic consistency across the study.

3.1. *UN SDG materials (Stimuli)*

The UN launched the SDGs to achieve a more sustainable future for the people and planet by 2030 using multiple platforms that advocate and promote SDGs using a game, videos, and a comic. 'World Rescue' is a narrative, scenario-based video game presenting five characters from different backgrounds who help to solve global problems (World Rescue, 2017). The videos included three short, animated narratives, 'World's Largest Lesson,' to help young people learn about the SDGs and inspire them to contribute and take action. The comic presented characters representing 'Heroes for Change' who try to overcome challenges to save the world. All these platforms shared a similar purpose, animated characters, narrative, and rational arguments in their messaging about promoting SDGs for a more sustainable future.

3.2. *Study 1: Online Experiment*

An experiment utilizing a between-subjects design was conducted with 441 Gen-Z college students aged 18-24 in the United States to compare the effects of the UN's Transmedia Edutainment with other single forms of narrative presentation (e.g., game, video, comic) and examined the persuasive impacts of narrative messaging by investigating the role of narrative engagement and perceived realism.

3.2.1. Procedure

The study's survey was developed and administered using Qualtrics. A study invitation with a link to the survey was shared via email to college students at a southwestern university and to Qualtrics panels to obtain a large sample with enough statistical power needed to run the required analysis (Armstrong, 2019). Upon clicking the link, participants are first asked to provide consent. Only Gen-Z individuals aged 18-24, residing in the U.S., were eligible for participation. After consent, participants begin by answering a pretest question on their environmental awareness, followed by random assignment to different conditions through Qualtrics. After exposure to the assigned condition, participants answered attention check questions and concluded by answering a post-test. In the transmedia condition, participants were asked to watch videos, answer attention check questions, read a comic and answer attention check, play a game, and conclude by completing a post-test about their narrative experience. Attention check questions are simple questions about the stimulus to ensure exposure. In the control condition, participants were not exposed to any treatment and were asked to answer the post-test; this follows the same approach used by other E-E studies (e.g., Chen & Lin, 2014; Kim *et al.*, 2014).

3.2.2. Participants

For this study, 441 Gen-Z college students between the ages of 18-24 ($M = 20.51$, $SD = 1.66$) were recruited from the United States to complete the experiment. The number of participants in each condition was: comic ($n = 91$), videos ($n = 84$), game ($n = 93$), transmedia ($n = 85$), and control ($n = 88$). Most of the sample were females ($n = 288$, 65.3%), and less than half were males ($n = 147$, 33.3%). Participants identified as White/Caucasian participants ($n = 244$, 55.3%), Hispanic/Latino ($n = 89$, 20.2%), Asian ($n = 51$, 11.6%), Black/African American ($n = 48$, 10.9%), or Middle Eastern ($n = 9$, 2%). All participants were college students including freshmen (26.8%), sophomores (19.7%), juniors (23.8%), seniors (21.1%), or graduate students (8.6%).

3.2.3. Measures

All constructs were measured using multi-item scales validated in previous research and modified to capture the constructs fully.

Narrative Engagement. It measures the narrative experience as individuals engaged with a narrative adapted from Busselle and Bilandzic (2009) using a 5-point Likert scale. Sample items included "I had a hard time recognizing the thread of the story" and "The story affected me emotionally." The reliability of the overall narrative engagement scale was (α = 0.858).

Counterarguing. It measures an individual's tendency to disagree or dispute critically with the persuasive message as a form of resistance (Slater & Rouner, 2002). It was assessed using a 5-point Likert scale adapted from Nabi *et al.* (2007). Sample items included "I found myself actively disagreeing with the author's message" and "I was looking for flaws in the author's arguments" (α = 0.628).

Perceived Realism. It measured perceptions of "realness" (the degree to which the event in a narrative could happen in the real world) that affect engagement with the narratives and their persuasive power (Busselle & Bilandzic, 2008). The scale was adapted from Cho *et al.* (2014). The scales were measured using a 5-point Likert scale. Sample items included "The event in the transmedia portrayed possible real-life situations" (α = 0.914).

Behavioral Intention. It measured the intention to perform sustainable behaviors and was adapted from Michalos *et al.* (2012) using a 5-point Likert scale. Sample items included "I will not waste water," "I will try to recycle as much as I can," and "I will give more thought about how to live sustainably" (α = 0.867).

Knowledge. It measures an individual's knowledge of sustainable development adapted from Al-Naqbi and Alshannag (2018) using a 5-point Likert scale. Sample items include "Economic development is necessary for SD" and "SD requires individuals to reduce all kinds of waste" (α = 0.950).

3.3. *Study 2: Focus groups*

This qualitative study consisted of five focus groups, each with 4-5 participants (totaling 21 individuals), all of whom were Gen-Z college students aged 18-24 in the United States. The focus groups aim to capture young adults' impressions and attitudes toward TE-E, offering valuable insights into their experiences with the UN TE-E narrative.

3.3.1. Procedures

A study invitation was sent to faculty with information describing the research project and asking them to share it with students and assign extra credit in return for participation. Students interested in participating completed the consent form and signed up using the link in the study invitation.

Students were asked to play before the focus group to save time for discussion during the focus group and accommodate their busy college schedule. A game link was sent with instructions; they had two days to try the game, and then they were asked to send a screenshot showing their game progress to ensure they played the game and reported playtime, which was between 15-45 minutes total. After completing the game, focus group meeting times were scheduled via Zoom, and video and audio were recorded after obtaining participants' consent.

Focus groups started by greeting participants and introducing the study objective, and then the session began with a brief introduction and warm-up questions. All focus groups used photo-elicitation to assess participants' reactions to the materials. It is a qualitative procedure that involves showing participants photos or videos to elicit engaged conversation around a given topic (Richard & Lahman, 2015). Also, each focus group was organized to discuss each medium separately to obtain participants' impressions and experience on each platform, followed by a discussion of the overall transmedia experience. Thus, we started the discussion about the game since they had already played it; then, participants were shown the videos, followed by a short discussion, and the same process for the comic. After discussing each platform, there was a discussion of the overall TE-E to explore their views, impressions, attitudes,

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and experiences of the UN TE-E. In the end, the researcher expressed thanks and appreciation for their time, input and shared a short survey link with a few questions and demographics.

3.3.2. Participants

The qualitative study sample involved five focus groups, with a total of 21 Gen-Z college students aged 18-24, recruited from a mid-sized university in the southwestern United States United States. Each group, consisting of 4 to 5 participants, was conducted via Zoom, following Nyumba *et al*.'s (2018) recommendation for online web conferencing, and lasted approximately 90 mins. The sample included 18 females (86%) and 3 males (14%) between the ages of 18-24 ($M = 22$). Of the participants, 10 were Asian (47.6%), 4 were White (19%), 4 were Hispanic (19%), and 3 were Black (14.3%). Participants ranged from freshmen to senior students. Students reported no prior exposure to the UN TE-E but reported varying levels of environmental consciousness, which was healthy for the discussion.
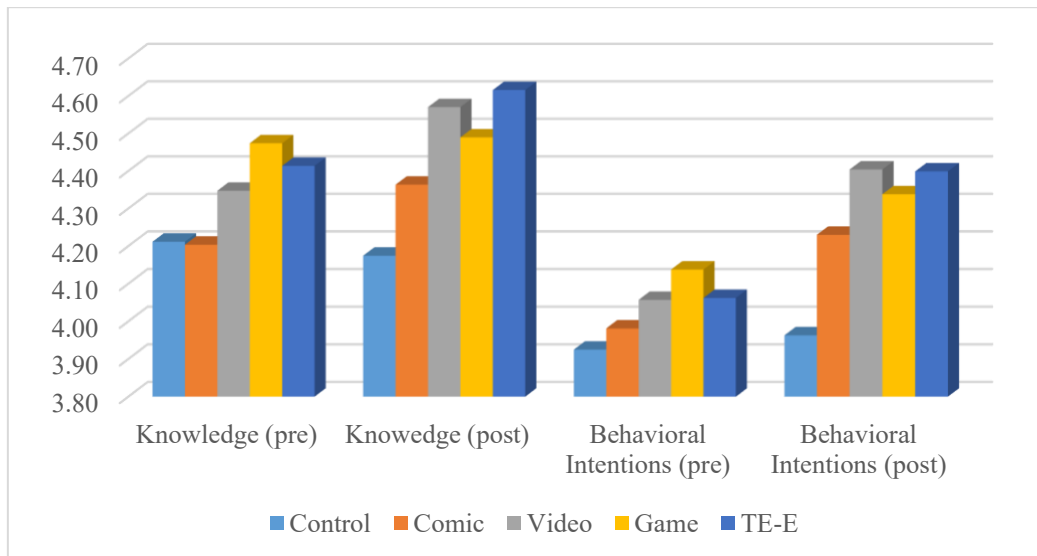
3.3.3. Data Analysis

All focus group discussions were analyzed using thematic analysis to "identify, analyze, organize, describe, and report themes found within a data set" (Nowell *et al*., 2017, p.2). First, they were transcribed and written verbatim word-for-word, including participants' verbal and non-verbal responses, group interactions, and moderator's comments. Next, reading through each transcript carefully to become familiar with the content and take notes of first impressions. Then, following an inductive approach (Nowell *et al*., 2017), data was examined closely, followed by assigning initial codes based on reading the data line by line and grouping relevant parts together. In the next step, responses were re-read searching for themes that can be identified by bringing together the fragmented ideas that link data together, analyzing data for patterns of agreement or differences, and synthesizing codes into broad themes. In the last step, the themes were refined and modified to reflect the full data set. This process led to capturing themes emerging from the focus group discussions that describe the attributes and the benefits as well as disadvantages and obstacles facing TE-E.

4. Results and Discussion

4.1. *Experiment Results*

The first hypothesis explored how exposure to the UN TE-E narrative generates high levels of knowledge and pro-environmental behavioral intentions toward SD compared to single narratives. A one-way multivariate analysis of variance (MANOVA) was run to compare knowledge and behavioral intentions among the conditions. Results indicate an s statistically significant difference in knowledge and behavioral intentions across media platforms (Pillai's trace = 0.089, $F(8, 872) = 5.05$, $p < 0.01$, $\eta^2 = .044$). A pairwise comparison revealed that the transmedia resulted in higher behavioral intentions than the comic (*M.diff* = .169, *SE* = .085, $p < .05$) and the control (*M.diff* = .426, *SE* = .085, $p < .05$), but no statistically significant difference between the video ($p = .96$) or the game ($p = .47$). Similarly, regarding knowledge, a pairwise comparison revealed that the transmedia resulted in higher knowledge gain than the comic (*M.diff* = .252, *SE* = .093, $p < .05$) and the control (*M.diff* = .441, *SE* = .093, $p < .05$), but no statistically significant difference between the video ($p = .63$) or the game ($p = .17$). The results partially support H1. Figure 1 shows the knowledge and behaviors across conditions pre- and post-exposure.

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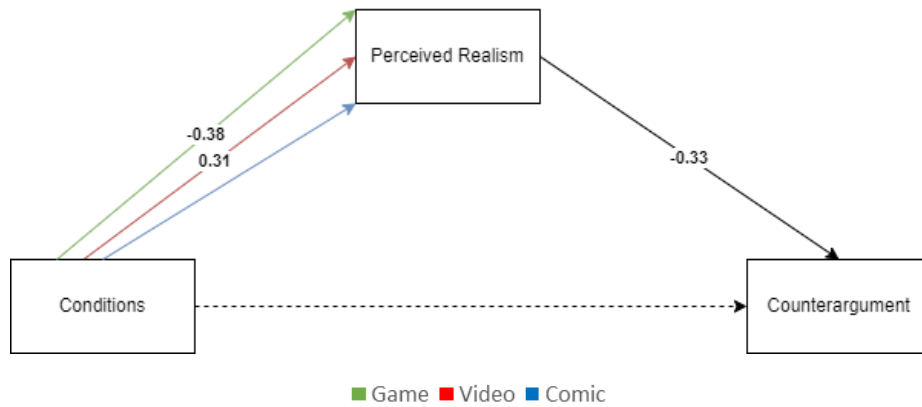**Figure 1**. Comparing Knowledge and Behavioral Intentions Across Conditions.

Source: Own elaboration.

Hypothesis 2 stated that exposure to UN TE-E would lead to higher (a) perceived realism and (b) narrative engagement compared to single media platforms. Thus, a one-way multivariate analysis of variance (MANOVA) was run to compare perceived realism and narrative engagement across conditions. The results show a statistically significant difference between perceived realism and narrative engagement across conditions (Pillai's trace =0.161, F (6, 698) = 10.18, p < .01, η^2 = .080). A pairwise comparison revealed that the transmedia resulted in more realism than the game (*M.diff* = .382, *SE* = .129, p < .05) but less realism than the video (*M.diff* = -.306, *SE* = .132, p < .05), while the comic was not significant (p = .28). For narrative engagement, transmedia resulted in more narrative engagement than the game (*M.diff* = .324, *SE* = .104, p < .05), but less narrative engagement than the video (*M.diff* = -.355, *SE* = .106, p < .05) and comic (*M.diff* = -.223, *SE* = .104, p < .05). The results partially support H2.

Hypothesis 3 argued that perceived realism in the UN TE-E will mediate the relationship between conditions with the counterargument. An SPSS PROCESS macro was used to assess the proposed hypothesis (Hayes, 2017) with a multi-categorical IV comparing all groups to one "reference group=transmedia." The type of coding used was "indicator," and bootstrap analysis was run with 5,000 iterations using model 4. Results found one significant direct effect (B = .26, p = .01), showing that TE-E resulted in less counterargument than the video. With perceived realism as the mediator, results indicated that the model was a significant predictor of counter-argument [F(4, 348) = 16.80, p < .01, R^2 = .16]. Results showed that relative to transmedia, the video resulted in a less counterargument by .10 units (*B* = .10, 95% CI of -.03 to -.18). However, the game condition had a higher counterargument relative to the transmedia (*B* = .13, 95% CI of .23 to .03) (see Figure 2). However, mediation was not established for the comic condition group comparison because the regression coefficient between the comic and realism (path a) was not significant at p = .28, and the Zero falls within the CI range (.03 to -.13). Thus, H3a was partially supported.

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Figure 2. Mediation Model 1.

Source: Own elaboration.

For H3b, the study assessed whether perceived realism and counterargument serially mediate the relationship between conditions on behavioral intentions using the same SPSS PROCESS macro with model 6 and multi-categorical IV. Results showed that there is evidence of serial mediation indirect effect $(X \twoheadrightarrow M_1 \twoheadrightarrow M_2 \twoheadrightarrow Y)$ on behavioral intention (Y) through perceived realism (M_1) and counterargument (M_2) (see Figure 3). Relative to transmedia, the videos had a serial indirect effect ($B = 0.027$, 95% CI of .007 to .052) on behavioral intention mediated through perceived realism and counterargument. The game had a serial indirect effect ($B = -.034$, 95% CI of -.068 to -.010) on the behavioral intention mediated through perceived realism and counterargument, probably because the game was not perceived as realistic enough. However, serial mediation was not established for the comic ($p = .281$) because the Zero fell within the CI range.
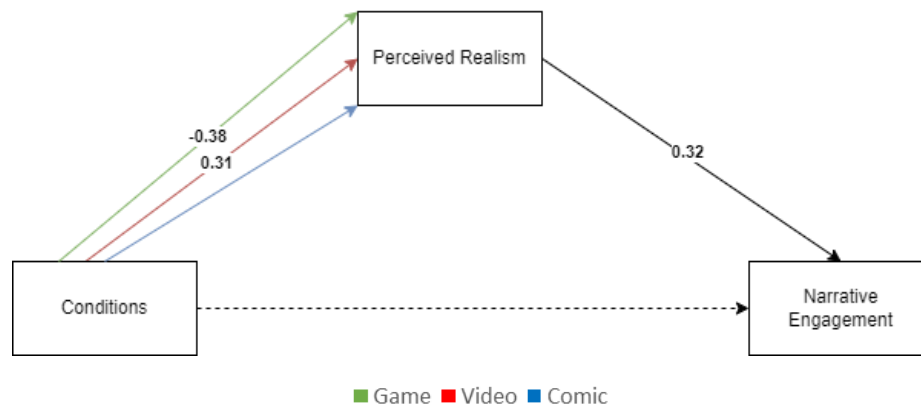
Figure 3. Serial Mediation Model 1.
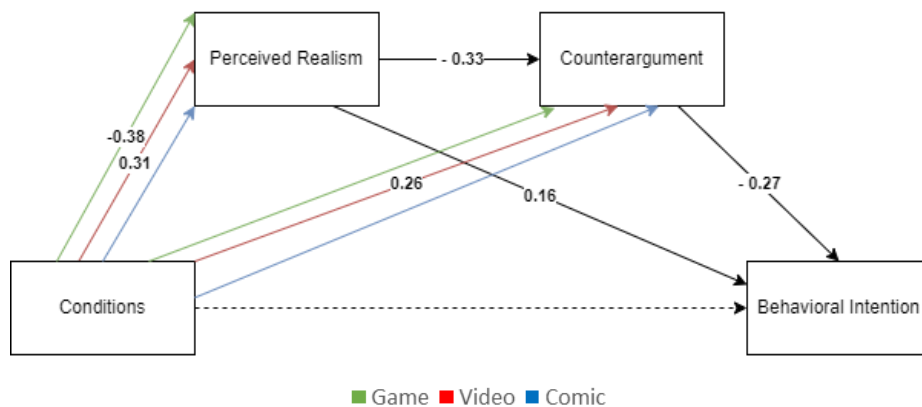
Source: Own elaboration.

Hypothesis 4a argued that narrative engagement with the UN TE-E will mediate the relationship between conditions with the counterargument, the same SPSS PROCESS macro was used to assess the hypothesis. Results indicated that the model was a significant predictor of narrative engagement [$F_{(4, 348)} = 30.48$, $p < .01$, $R^2 = .26$]. Results showed that relative to transmedia, the video resulted in a slightly higher narrative engagement ($B = .10$, 95% CI of .03 to .18), while the game had a lower narrative engagement ($B = -.13$, 95% CI of -.20 to -.03) (see Figure 4). However, mediation was not established for the comic condition group comparison because the regression coefficient between the comic and realism (path a) was not significant at $p = .28$, and the Zero falls within the CI range (.03 to -.13). Thus, H4a was partially supported.

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Figure 4. Mediation Model 2.

Source: Own elaboration.

For H4b, the study assessed whether perceived realism and narrative engagement serially mediate the relationship between conditions on behavioral intentions using the same SPSS PROCESS macro with model 6 and multi-categorical IV. Results showed that there is evidence of serial mediation indirect effect ($X \twoheadrightarrow M_1 \twoheadrightarrow M_2 \twoheadrightarrow Y$) on behavioral intention (Y) through perceived realism (M_1) and engagement (M_2) (see Figure 5). Relative to transmedia, the game had a serial indirect effect (B = -0.032, 95% CI of -.06 to -.008) on the behavioral intention that is mediated through realism and engagement. The video had a serial indirect effect (B =-.030, 95% CI of .006 to .051) on the behavioral intention mediated through perceived realism and engagement. However, serial mediation was not established for the comic because it did not have a direct effect (path a) on perceived realism (p = .46), and the Zero fell within the CI range.

Figure 5. Serial Mediation Model 2.
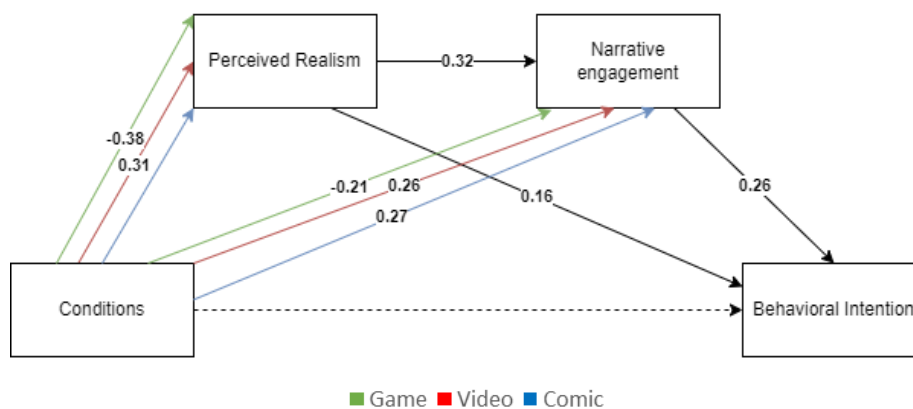
Source: Own elaboration.

4.2. *Focus Group Discussions*

The thematic analysis revealed two emerging themes; "The persuasive power of the TE-E and its triple R effect" and "Is it real enough?"

4.2.1 Theme One: The Triple 'R' persuasive effect of TE-E

The theme captures the persuasive potential of transmedia that emphasizes the narrative (relatable), message (reinforceable), and communication channels (reachable), which we conceptualize as the *Triple R Effect*. Many participants emphasized the role of narrative in TE-E. The word 'narrative' was used 45 times in the discussion, and derivatives of the word 'story'

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(storyline/storytelling/stories) were used 64 times. The most notable aspect of the TE-E narrative was *relatability*, in which many participants reported that they could relate to the narrative and that the stories were relevant. One participant said, "It is the individual narratives for me, when you hear the narrative, it's like you're curious to find out more. It just keeps you intrigued to find out what's next." Most participants agreed that the narrative was captivating, eye-catching, and engaging. The storylines kept them hooked, thirsting to follow the story and know more. Also, the narrative helped them connect or relate to the message presented in the TE-E. To illustrate, one participant said, "Again, I go back to the narratives and the individual stories because they made it more personable and relatable." For example, the stories in the videos showed real-life examples, such as developing a sustainable urban farm for people they can relate to.

Our findings are consistent with the literature emphasizing how TE-E leverages the power of storytelling and makes the narrative stronger and more compelling by involving the audience in different ways, intensifying the depth of their experience that is crucial to the success of TE-E (Hancox, 2017; Sangalang *et al.*, 2013). Also, many participants reported that the use of narrative helped them understand environmental concepts and necessary behavioral changes they could partake them, which refers to narrative understanding, a subdimension of narrative engagement (Busselle & Bilandzic, 2009). This is because "if you're not paying attention to the narrative, it is very hard to understand what's going on," said one participant. For example, in the game, students agreed that reading the short narrative lines along with the required game task helped them understand its purpose, yield more engagement. However, students who skipped the narrative struggled in the game, as explained by one participant:

> I skipped the narrative in the beginning and then like only after a few times. I was like, maybe I should read it. When I went back to it, definitely towards the end, the game started to make more sense. Because before I was like, oh, I don't know why I'm doing this, whereas after I started reading it, I was like okay, it makes sense.

Another transmedia persuasive attribute is *reinforceability*, in that exposure to the TE-E acts as a message reminder and helps with message reinforcement. This results from the frequent exposure to the messages/narratives presented across different platforms that reinforced participants' environmental and SD beliefs. Each platform generates an experience that complements and reinforces content on other platforms. One participant explained that "as they engage in more than one of the options (i.e., platforms), they're actually reinforcing the content that they're trying to impose on the audience. So honestly, they're learning and accepting it more because it's getting reinforced in their brain multiple times." Reinforcement can also increase one's sense of motivation or self-efficacy to do something. Nearly all of the students shared they gained more knowledge and reported feeling motivated and supportive toward the issue of SD. This is because students agreed that the content was simple, easy to understand, engaging, and evoked no counterargument after exposure, that ties back to the "relatability," which made receiving and absorbing the message easy and quick. This was stronger among participants who claimed to be environmentally conscious. For example, "I grew up with parents who instilled in me like having to protect and recycle. So, I'm already like a step ahead. It (TE-E) was motivating in a sense of like to keep going."

The last attribute of persuasion is "reachability," which captures how TE-E reaches and engages various audiences with persuasive messages tailored to their different media preferences and learning styles. It demonstrates TE-E's potential to expand its reach, which is necessary for advocacy communication, given the proliferation of viewing platforms resulting in the current state of audience fragmentation (Nielsen, 2014). The TE-E is capable of spreading the message across a broader audience by using multiple platforms such as videos, game, and comic that helps to reach different people with diverse backgrounds, tastes, and interests, as one participant puts it "If you don't hit me on one platform. You could hit me on another."

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Another participant explained that this could help achieve the campaign's objective or support advocacy efforts because "obviously multiplatform is going to be more effective because the more platforms you have, the more audience you're going to reach." When students were asked about preferring a single medium or a TE-E, most preferred the TE-E because it appeals more to their preferences and likings. One student explained, "This kind of multiplatform communication is suitable for different platforms, different audiences, and different scenarios. It can actually hit our perceptions and our sensors like hearing, eyes, feeling, so this is more impressive than just single channel."

The use of TE-E is more suitable when the issue is big, multidimensional or impacts many people, because it helps reach a wider audience base and to get the message across to as many people by offering more media choices tailored to their learning. This is because different people have different learning styles; some people are visual learners, while others are verbal learners (Kollöffel, 2012). Thus, having multiple platforms (i.e., a video, a game, and a comic) can appeal to their learning styles and help them digest the message better. For example, one student explained:

> You're still eating at the end of the day, you're still learning about the sustainable goals, but some people learn better in different ways. Like some people would rather read, some people would rather like be interacting in a game, some people would rather watch a video. Like I just think everyone has an option. Also, I think the options are very different, like listening to a video versus playing a game from the app store is like very different to me. I know they're on the same general idea, but different options teach people to different degrees. [Everyone was nodding in agreement with her].

These findings indicate that the triple R effect can better explain the persuasive power of TE-E and how to better utilize TE-E.

4.2.2. Theme Two: *"Is it real enough?"*

"*Is it real enough?*" emerged as the second theme that captures young adults' perceptions and opinions of potential challenges facing the UN TE-E. This theme focused on the main challenge concerning the lack of real-world footage and replacing it with the use of animation; the word "animation" was used 22 times, and derivatives of the word 'real-' (e.g., real-footage, real-world, real-image, real-people) were used 13 times in the discussions, which capture the importance of perceived realism for an environmental advocacy narrative to convey its urgent and real. Some participants felt using animation instead of real-world scenes reduced the sense of realism and the urgency/severity of the issue, negatively affecting their motivation and behavioral intentions to support SD. These findings align with past literature on perceived realism that states that any perceptions of "unrealness" of the story can lessen narrative power as any violations to realism can disturb narrative engagement experience (Busselle & Bilandzic, 2008; Wang & Singhal, 2016). Some participants also agreed that real-world footage, such as dead fish in the ocean or wildfires, induces a shock factor that demands instant attention and justifies the need for supportive actions. One participant explained:

> I feel like it was engaging, but not to the point where I would share it to someone else because I'm just seeing an animation. So, it didn't have that big of an impact on me. I feel like when you can see like actual stuff happening, that's when people actually care and want to share. Like, if we were to see the fires in California, it's something that leaves an impact. And it's like shocking to see. Whereas when you just hear information, it's like yeah, it's interesting, but I don't know if I would send it to a friend saying Oh, watch this, this is what's happening.

On the other hand, other participants shared that the animation was a necessary strategic choice because it appeals to all ages and is considered gender-neutral, race-neutral, and age-neutral characters. Such an approach could target those not old enough to make decisions and adopt sustainable behaviors, which would have a bigger impact. One student explained, "I have a different opinion. I think that the video animation should be shared to adults. Because I know

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for elementary students, I don't think they know what education equity is, or what is industrial innovation. So, this has all kinds of professional words actually that is more adults oriented."

Another challenge revealed by many participants was that they enjoyed hearing and watching but not reading the content. For example, some participants reported that the game having long storylines, which felt long and repetitive, so they skipped it. This indicates that too much narrative text was working against narrative persuasion because participants ended up skipping the narrative which made the message less clear and less appealing and thus, less persuasive. One participant expressed "maybe if the narratives were shorter and to the point, I think that would make it easier for the user. I skimmed through because there were a lot of stories." One suggestion was to embed the videos within the game as it would be more entertaining to 'watch the narrative' rather than 'read the narrative.' Thus, to achieve better prosocial outcomes, consider rethinking the use of animation and narrative length in message design.

5. Discussion

This study empirically investigates TE-E as a promotional strategy to foster pro-environmental messaging and behaviors among Gen-Z, offering valuable implications for both theory and practice. Overall, the findings provide strong theoretical support for the application of the Busselle and Bilandzic (2008) framework, alongside the counterargument narrative mechanism, in understanding the role and influence of TE-E. Consistent with past research (Oschatz & Marker, 2020), results confirm that narrative messages are more persuasive than non-narrative messages in gaining more knowledge and encouraging behavioral intentions to support SDGs.

The focus groups were able to highlight the key features and attributes of TE-E. The discussions revealed that the UN TE-E enjoyed the triple R effect (Relatable-Reinforceable-Reachable) as stories were relevant and *relatable* to the audience, making it easy to understand, keeping them involved and intrigued to find more. The TE-E helped overcome audience fragmentation and maximize *reach* by spreading the message across different platforms tailored to the individual's media preferences and learning styles, thus making the intervention more targeted and efficient. The TE-E was also *reinforcing* because frequent exposure and engagement within the TE-E narrative acted as a message reminder and helped with message reinforcement, heightening one's motivation or self-efficacy to take supportive actions towards SD. Nevertheless, there is a fine line between reinforcement that fosters positive outcomes and repetition that may discourage supportive actions. This subtle distinction can significantly influence the success or failure of TE-E.

In the experiment, a surprising finding in our mediation analysis showed that the TE-E resulted in less counterargument than the video in the direct effect, supporting that exposure to the TE-E narrative conveying sustainable practices and its positive impact can lead to message reinforcement and less resistance. This is consistent with past research on TE-E (Wang & Singhal, 2016) and in line with what one of the participants in the focus groups said about learning and accepting TE-E message, "because it's (message) getting reinforced in their brain multiple times," which ties back to the "reinforce-ability" theme discussed in our focus group discussions. However, surprisingly, after adding perceived realism as a mediator, results showed that the video resulted in less counterargument than the TE-E. This discrepancy on why the direct effect worked better for TE-E than the mediated effect can be explained by Busselle and Bilandzic (2008) framework that inconsistencies in perceived realism can trigger counterargument, upon introducing realism as a mediator, TE-E had less realism which triggered counterargument. This reduction in TE-E realism can be attributed to animation characters, which negatively influenced perceptions of realism of TE-E. As explained in our focus groups, some participants strongly felt that using animated characters instead of human beings made the topic less realistic and less urgent. These findings align with previous research on the credibility of animation characters, which found better persuasion outcomes when the use of an animation character was minimized because "animation can act as a distraction from the

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comprehension of the information required to make a decision" (Parmar *et al.*, 2020, p. 1017). Similarly, Brusse *et al.* (2017) contend that animation characters in E-E are not as immersive as other forms of E-E because it can be more difficult to identify with a cartoon character than a human character. Since the transmedia had the highest concentration of animation characters across multiple platforms, it could potentially backfire or pose a higher risk of negatively affecting perceptions of realism. Furthermore, the game and comic had issues with design and clarity, which could reduce overall transmedia realism.

Regarding narrative engagement, the mediation analysis showed that the video was slightly better than transmedia. This is several interpretations; one is consistent with Busselle and Bilandzic (2008) framework that inconsistencies in perceived realism in the transmedia will reduce narrative engagement. Also, the video was the most preferred among Gen-Z because it is clear and well-produced, while the game had the least narrative engagement because it received criticism for its unclarity and long narratives, resulting in users skipping its narrative. The comic was not significant, which is not surprising given that it was perceived as the least popular among Gen-Z. Consequently, these disparities can transfer or negatively influence the transmedia narrative engagement as two out of three platforms received negative criticism, and TE-E is sensitive to the quality of each platform they encompass. Additionally, narrative engagement for the TE-E could be low because having many characters can reduce narrative coherence, resulting in a looser narrative structure (Green & Jenkins, 2014), while having unified characters across all platforms increase the sense of identification and transportation into the narrative leading to stronger narrative engagement.

6. Conclusion

Overall, this research is one of the few empirical studies to explore the applicability of TE-E in promoting pro-environmental behaviors, while also contributing to the expanding TE-E literature by providing a deeper understanding of its role, narrative influence, key features, and attributes. Findings showed that TE-E was able to reduce counterarguments directly not mediated through realism and had slightly lower narrative engagement than video due to low realism and the game within TE-E. This paper recommends using human-like characters, maintaining character consistency across platforms, and pretesting each platform before adding to TE-E to ensure success.

6.1. *Practical implications*

This research provides practical implications for environmental activists in designing a more effective and influential TE-E narrative experience. For message design, using short narratives to avoid skipping the narrative and using platforms rich in visual elements, such as videos, is more appropriate for Gen-Z. Environmental advocates also need to consider the pros and cons of using animation or human characters. While real people and real-world pictures increase perceptions of realism of the story and character identification leading to more narrative engagement, animation characters are age-neutral, gender-neutral, and race-neutral, meaning that they can appeal to multiple segments of society. Furthermore, designing and planning the TE-E as a hard transmedia (i.e., transmedia planned with transmedia goals in mind from the start) creating one big narrative expanded across different platforms can lead to having unified characters across all platforms, which increase narrative coherence and engagement among the audience to improve persuasive outcomes. Lastly, pretesting each platform before adding it to TE-E to ensure success.

6.2. *Limitations and Future Research*

One limitation of the study is prior knowledge about SD or levels of environmental consciousness can influence their reception of each medium, the TE-E, and behavioral intention. Also, the qualitative sample participants were predominantly from a southwestern university, which may limit the generalizability of the results to broader populations. The gender imbalance, with a

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predominance of female participants, may limit the generalizability of the findings to a more gender-diverse population. Moreover, this study focuses on the overall transmedia experience compared to single-media experience and can be influenced by dose effect, which is a good suggestion for future studies. Additionally, the likes/dislikes of a specific platform can transfer to the transmedia, making it hard to measure TE-E's true impact. For example, participants liked the video but did not like the game; and the TE-E included both, it is hard to link if its effects were due to a specific medium or this is the combined effect of all platforms. Additionally, experimenting online may have impacted the participants' levels of attention and engagement with the content.

Future research should investigate the impact of character identification on transmedia persuasion and test narratives with different levels of connectivity to determine if it has more persuasive outcomes for TE-E. Lastly, consider examining different generational responses to TE-E and conduct long-term follow-ups to examine if behavioral intention can result in long-term behavioral change.

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