

Transmedia Edutainment for Sustainable Advocacy: How Narrative Engagement and Counterarguments Influence Generation Z’s Response to Sustainable Development Messages

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Media convergence has created new forms of storytelling, such as transmedia edutainment (TE-E), which can serve as an innovative communication strategy for promoting pro-environmental attitudes and behaviors. Because of the limited evidence about the persuasive outcomes of narrative TE-E, this research investigates the role of TE-E as a novel communication approach that advocates for sustainable development among Generation Z. Drawing on narrative persuasion theories, we conducted an experiment ($N = 441$) that examined the narrative mechanisms of TE-E, focusing on narrative engagement and counterargument, and assessed the narrative outcomes of different single formats—including video, game, and comic—compared with TE-E. Findings revealed that TE-E effectively minimized counterarguing compared with other single platforms, yet the video format strongly fostered narrative engagement. Overall, this research provides practical contributions for environmental advocates in designing a successful TE-E.

Keywords: transmedia, edutainment, sustainable development, environmental education, environmental communication, narrative engagement, counterargument

Amid escalating environmental challenges, effective communication about sustainability is more urgent than ever to raise awareness, influence behavior, and drive collective action toward environmental preservation. In response to the escalating global environmental challenges, the United Nations (UN) launched the sustainable development goals (SDG) to foster a better and more sustainable future for people and the planet by 2030 (UN-SDG, 2015). To support these goals, they developed transmedia edutainment (TE-E) to promote them. TE-E is a novel communication approach that stems from transmedia storytelling. It represents several stories with no repetitions, expanded over a period of time

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via multiple media platforms to engage the audience and intensify their narrative experience to drive social change (Atarama-Rojas & Feijoo, 2023; Gambarato, 2013). Each platform can present different stories or new extensions of a single story, all interconnected within a larger story world that communicates the overarching message.

In recent years, a growing body of literature has highlighted the promising potential of TE-E as a powerful communication strategy for advocating prosocial behaviors (Heilemann, Martinez, & Soderlund, 2018; Wang & Singhal, 2016). TE-E emerged from entertainment-education (E-E) or edutainment, a valuable approach for designing and implementing a communication intervention that embeds an educational message in entertaining narratives. By leveraging the power of storytelling across multiple platforms, TE-E challenges social norms and encourages behavior change (Sangalang, Quintero-Johnson, & Ciancio, 2013; Wang, Singhal, Quist, Sachdev, & Liu, 2019). The goal is to create educational and enjoyable messages that foster positive attitudes, which can shift social norms and lead to behavioral, social, and environmental changes (Singhal & Rogers, 2012).

As sustainability affects individuals in diverse ways, conveying it through a singular narrative or platform is challenging. Therefore, using TE-E to communicate different stories across different platforms may effectively address complex issues such as sustainability because of its multidimensionality. This approach leverages the unique strengths of each medium to create a synergy of content between different platforms, which helps attract fragmented audiences, adapt to the decline of some platforms, and cater to audiences' evolving media preferences (Selvadurai, Vistisen, & Binns, 2022).

TE-E engages the audience in a dynamic, evolving narrative centered around one big story world expanded across different platforms. For example, *East Los High* presented a single-story-world online drama centered on promoting sexual and reproductive health among young Latinos/Latinas (Wang & Singhal, 2016). It used narrative extensions across various platforms, including websites, social media, and vlogs. A more recent example is the #EKIN_klima transmedia campaign, which successfully raised awareness about climate change, enhanced audience engagement, and increased community involvement by incorporating interactive digital platforms such as websites, short and long-form videos, social media, mobile apps, and online communities (Alonso-Jurnet & Larrondo-Ureta, 2024).

On the other hand, transmedia research has generally been descriptive (Gambarato & Medvedev, 2017; Tárca, Alzamora, Cunha, & Gambarato, 2023) and primarily centered on semiotics (Peña & James, 2023; Scolari, 2013) or the creators of transmedia (Kustritz, 2022; Wang et al., 2019). At present, there is limited evidence on the impact, process, and persuasive effects of TE-E (Ferreira, Nunes, & Nisi, 2021). Additionally, there is a lack of research comparing the persuasive impacts of TE-E communication to single digital platforms. Further investigation is needed to broaden the scope of research beyond qualitative examinations of transmedia cases and to investigate how audiences engage with transmedia content. Therefore, this article explores TE-E as a new strategy for environmental advocacy communication, examining Generation Z's (Gen Z) reception of the UN's TE-E on the SDGs (UN-SDG, 2015). We advance theoretical knowledge on the narrative and persuasive effects of the UN's TE-E compared with single-media formats (e.g., video, serious game, comic), examine Gen Z's

responsiveness to TE-E content, and explore how it subtly influences their attitudes, behavioral intentions toward the SDGs, and potential for social and environmental change.

This research focuses on Gen Z, as they are the most impacted by resource availability and likely experience the long-term consequences of sustainability challenges. Gen Z favors social and environmental justice, making them deeply invested in sustainability issues (Swim, Aviste, Lengieza, & Fasano, 2022). Moreover, they represent a driving force in supporting sustainable development (SD), as they are the future citizens who will advocate for a more sustainable society (Ghouse, Shekhar, & Chaudhary, 2024). Additionally, empirical evidence suggests that a multiplatform approach is more effective for engaging Gen Z, who are digital natives (Alonso-Jurnet & Larrondo-Ureta, 2024). They rely on technology and excel at media multitasking, seamlessly navigating multiple digital platforms, which makes them more responsive to diverse digital communication styles (Parker & Igielink, 2020).

Literature Review

Emerging technologies and digital media platforms have ushered in an era of media convergence (Jensen, 2022) that has transformed discussions about environmental issues and promoted pro-environmental behaviors among Gen Z (Suryaputra, Daryanti, & Setyowardhani, 2024). Past research has found that digital media encourages Gen Z to adopt sustainable practices and pro-environmental behaviors, as they align strongly with their values and priorities (Confetto, Covucci, Addeo, & Normando, 2023). This media convergence culture has inspired TE-E—a communication strategy that embraces the power of storytelling across multiple communication platforms to advocate for social or environmental issues and influence prosocial behaviors (Vantamay, 2019; Wang & Singhal, 2016). For example, *Collapsus*, a social activism project, uses integrated newscasts, interactive maps, and video blogging to inform and engage participants about the future of the global energy crisis (Von Stackelberg & Jones, 2014). Due to the changing nature of the media landscape, transmedia storytelling helps to reach fragmented audiences and engage them longer by integrating different media platforms (Lutkenhaus, Jansz, & Bouman, 2019).

Past literature on SD, which balances environmental and social factors for the well-being of both people and the planet, has primarily focused on a single narrative format (Ruggerio, 2021). For example, Moyer-Gusé, Tchernev, and Walther-Martin (2019) found limited behavioral changes after young adults watched a single environmental video. In addition, Moore and Yang (2020) discovered that playing an environmental game did not influence players' environmental attitudes. Similarly, Lee, VanDyke, and Cummins (2018) analyzed the Facebook content of the *National Oceanic and Atmospheric Administration* and found that while it raised awareness, it failed to foster dialogue or actively engage the audience. In contrast, research has shown that multimedia platforms can more effectively drive engagement and behavior change. For example, Williams, Zraik, Schiavo, and Hatz (2008) found that *Sustainable Table*, an initiative that used a website, an online newsletter, and a series of short movies, successfully built supportive attitudes and behaviors among the public toward food sustainability and encouraged community action. Another recent example is the TE-E project called *3S*, which promoted sustainable consumption and pro-environmental behaviors through videos, social media, e-posters, and classroom activities, effectively engaging college students and motivating them to adopt more sustainable practices (Vantamay, 2019).

Theoretical Framework

The literature on TE-E draws on different theories of narrative persuasion, including the entertainment overcoming resistance model (EORM), narrative engagement (Busselle & Bilandzic, 2009), and extended elaboration likelihood model (Moyer-Gusé & Dale, 2017).

Narrative Engagement

Research shows that storytelling and narrative effectively promote the SDGs (Jørgensen & Boje, 2020; Lowery, Dagevos, Chuenpagdee, & Vodden, 2020). Narrative engagement helps scholars understand how a transmedia campaign operates to persuade audiences. Busselle and Bilandzic (2009) propose that the more engaged a person is with a narrative, the more it influences their attitudes and enjoyment. They developed a scale for narrative engagement to understand the mechanisms responsible for narrative outcomes, with four dimensions: narrative understanding, attentional focus, narrative presence, and emotional engagement. Sangalang and colleagues (2013) argue that those dimensions of narrative engagement are valuable in exploring the effectiveness of TE-E campaigns.

Narrative engagement influences public engagement with SDGs (Chattoo & Feldman, 2017). Coles (2024) found that transmedia effectively advocates for SDGs by engaging diverse audiences and fostering deeper emotional connections through interactive experiences, motivating individuals to contribute to SD by telling interconnected stories across various platforms such as social media, video games, films, and Web content. Research indicates that engagement with a narrative is a pleasurable experience correlated with enjoyment (Yang & Zhang, 2022); the more engaging the narrative, the more enjoyable. Additionally, emotional arousal may derive enjoyment (Nabi, Moyer-Gusé, & Byrne, 2007). Similarly, Wang and Singhal's (2016) study on a TE-E called *East Los High* found that the TE-E resulted in a high degree of audience involvement, emotional engagement, and thus enjoyment and supportive attitudes.

Messages on multiple platforms help ensure message exposure and resonance and allow for more involvement and engaging experiences (Kalinov, 2017). This is because transmedia is a multilayered approach to storytelling that intensifies the depth of experience and motivates more media consumption and engagement (Jenkins, 2003). For example, Coombs and Holladay (2021) demonstrated that transmedia can deeply engage audiences by helping them feel personally connected to sustainability challenges, thus making complex sustainability topics more relatable and memorable by building stronger emotional ties. Similarly, Chattoo and Feldman (2017) found that engagement with narratives promoting the SDGs increased awareness, support, and actions by evoking positive emotions and enjoyment. This aligns with Gambarato's (2013) claims that transmedia transforms passive audience consumption into active engagement because each medium generates an experience that complements and reinforces content on other platforms. Thus, this interconnected approach contributes to the broader narrative, fostering deeper audience engagement, enjoyment, and favorable attitudes (Selvadurai et al., 2022). Therefore, the following hypothesis is proposed:

H1a: Exposure to UN TE-E will lead to high narrative engagement compared with a narrative contained in a single medium.

RQ1: How do the subdimensions of narrative engagement vary across transmedia compared with a narrative contained in a single-medium narrative?

H1b: Narrative engagement will mediate the relationship between conditions and (1) enjoyment, (2) story-consistent attitudes, such that TE-E's narrative engagement will lead to (1) higher enjoyment, (2) higher story-consistent attitudes compared with a single medium.

RQ2: How do narrative engagement subdimensions affect the mediation effects?

Counterargument

Slater and Rouner's (2002) extended elaboration likelihood model (E-ELM) proposes that as individuals become immersed in the narrative, they become less critical and less likely to counterargue, thus making it easier to influence their beliefs, attitudes, and behavior. Green and Clark's (2013) research on tobacco use found that narrative immersion reduced counterarguments to persuasive messages. Furthermore, Ma (2020) found that immersive stories resulted in more narrative immersion, leading to less counterarguing and promoting prosocial attitudes to fight malaria. Thus, narrative engagement can lead to persuasion by influencing levels of counterargument.

Additionally, E-E has been effective for its subtle persuasive content and absorption in the narrative, which suppresses counterarguing and enhances persuasion (Moyer-Gusé, 2008). Similarly, TE-E shares the same subtle approach that is unlikely to lead to opposition to the story because of reduced cognitive load and narrative immersion (Green & Jenkins, 2014). McCormack, Martin, and Williams (2021) suggest that immersion, engagement, and enjoyment of narratives centered around SDG and environmental themes reduce resistance to these messages by limiting the audience's cognitive capacity to critique the content, leading them to overlook the persuasive intent behind the narrative. Indeed, in the UN TE-E, the messaging emphasizes benefits and positive outcomes by promoting "heroes for change" who tackle global problems and advocate for world rescue efforts. These messages, reinforced across various platforms, effectively minimized resistance and counterarguing. Thus, the following hypothesis is proposed:

H2: Exposure to the UN TE-E can reduce (a) counterargument and (b) increase behavioral intentions, compared with a narrative in a medium.

H3: Narrative engagement will mediate the relationship between medium conditions and counterarguments, such that narrative engagement in TE-E will reduce counterarguments compared with a single medium.

Method

An online experiment using a between-subject design was conducted to compare the effect of the UN TE-E to single forms of a narrative presentation (game, video, comic) to determine how TE-E affected

Gen Z's perceptions, attitudes, and behavioral intentions toward SD and explore if the actual effectiveness of TE-E is attributed to a single medium or a combination of all media.

Participants

The sample consisted of Gen Z, aged 18–24, living in the United States, recruited through two sources: extra credit at a Southwestern University and Qualtrics panels, ensuring a sufficiently large sample for statistical analysis (Armstrong, 2019). In total, 441 participants completed the experiment. The number of participants in each condition was as follows: comic ($n = 91$), videos ($n = 84$), game ($n = 93$), transmedia ($n = 85$), and control ($n = 88$). The average length of narrative exposure for the comic (7 min), videos (13 min), game (varied), and transmedia (< 20 min). The majority of the sample was female ($n = 288$, 65.3%), while males accounted for ($n = 147$, 33.3%), and participants ranged between 18 and 24 ($M = 20.51$, $SD = 1.66$). Participants identified primarily 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, and when asked about their environmental awareness, 23.4% said very much, 61% a little bit, 10.9% neutral, 4.1% not really, and 0.7% not at all.

In the control condition, the participants were not exposed to any treatment and were asked to answer the posttest. This approach has been used in the E-E literature by Chen and Lin (2014) and Kim, Lee, and Macias (2014).

Stimuli

Given the limited cases of TE-E in sustainability, this research uses the UN's TE-E as it is the leading international body responsible for establishing and promoting the SDGs. The UN launched this TE-E to promote the 17 SDGs to foster a more sustainable and equitable future for people and the planet by 2030 (UN-SDG, 2015). Their educational efforts provide credibility and ensure alignment with the SDGs, as they produce materials that combine educational content with entertainment across multiple platforms, making it essential to evaluate its effectiveness.

The UN SDG's TE-E includes a game, videos, and a comic. The game is called "World Rescue," and it is a narrative, scenario-based online game inspired by the 17 SDGs. It presents five young characters, each helping to solve a global environmental problem that takes place where they live: Kenya, Norway, Brazil, India, and China (World Rescue, 2017). The videos, referred to as the "World's Largest Lesson," are three short, interrelated animated narratives with the same narrator that introduce SD and present several inspirational stories of different individuals from diverse countries (such as Turkey, India, the United States, Nigeria, Indonesia, Jordan) solving several sustainable issues and environmental problems where they live (Global Goals, 2015). The comic, "Heroes for Change," presented stories of different characters trying to overcome environmental challenges and save the world (Global Goals, 2015). All these platforms shared the same purpose (to promote SDGs and solve environmental problems), as well as narrative and rational arguments in their messaging.

Procedures

An online survey was developed and administered using Qualtrics. After participants were informed about the study and provided their consent, only Gen Z age criteria of 18–24 and living in the United States were recruited for participation. First, participants answered questions on environmental awareness and completed a pretest before being randomly assigned via Qualtrics. The experiment was designed to ensure exposure and to avoid skipping the video and comic conditions. For example, they watched the video or read the comic before the button to proceed to the next step appeared. This was also followed by attention-check questions to ensure they engaged with the message. For the game and transmedia condition, participants were given a link to the game to explore and play, then take a screenshot of their game level and upload it as part of the posttest. Every screenshot was manually checked to ensure exposure; those who uploaded irrelevant pictures were disqualified. In the transmedia condition, participants were asked to watch a video, read a comic, play a game, and conclude by answering a posttest.

Measures

Attitudes are defined as individual attitudes toward SD that were adapted from Michalos et al. (2012), measured using 11 items such as “It is important to find ways to reduce poverty” using a 5-point Likert scale ($M = 47.30$; $SD = 6.43$; $\alpha = 0.819$).

Behavioral intention is the intention to perform sustainable behaviors that were adapted from Michalos et al. (2012), measured using 10 items using a 5-point Likert scale, such as “I will not waste water” ($M = 42.64$; $SD = 6.01$; $\alpha = 0.867$).

Narrative engagement is the experience of individuals engaging with a narrative (Busselle & Bilandzic, 2009). It consisted of four subscales: *narrative understanding* (ease of comprehending a narrative), *attentional focus* (viewers’ focus/distraction from the narrative), *narrative presence* (a sense of transitioning from the actual world to the story world), and *emotional engagement* (emotions viewers have toward the narrative). The scale has 12 items and was assessed using a 5-point Likert scale adapted from Busselle and Bilandzic (2009). 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 ($M = 38.40$; $SD = 9.02$; $\alpha = 0.858$), and the four subscales were *narrative understanding* ($\alpha = 0.835$), *attentional focus* ($\alpha = 0.940$), *narrative presence* ($\alpha = 0.753$), and *emotional engagement* ($\alpha = 0.801$).

Counterarguing is an individual’s tendency to critically disagree with or dispute the persuasive message as a form of resistance (Moyer-Gusé, 2008). The scale was assessed using four items adapted from Nabi et al. (2007), measured with a 5-point Likert scale, for example, “I found myself actively disagreeing with the author’s message” ($M = 8.04$; $SD = 2.96$; $\alpha = 0.628$).

Enjoyment is defined as whether the narrative was a pleasurable experience (Busselle & Bilandzic, 2009). The scale was adapted from Tal-Or and Cohen (2010) and consisted of three items and measured using a 5-point Likert scale such as “This is a transmedia that I can enjoy” ($M = 9.99$; $SD = 3.32$; $\alpha = 0.927$).

Results

Narrative Engagement

The first hypothesis (H1a) aimed to compare narrative engagement among the transmedia, videos, the game, and the comic. To test this, a one-way analysis of variance (ANOVA) was run, and Levene's test showed that equality of variance was met ($F(3, 349) = 1.22, p = .30$). Results found a statistically significant difference between groups as determined by one-way ANOVA ($F(3, 349) = 16.51, p < .001$). A Tukey post hoc test revealed that narrative engagement for transmedia ($M = 3.15, SD = .74$) was higher than the game ($M = 2.83, SD = .72, p < .05$) but lower than the videos ($M = 3.51, SD = .71, p < .05$; see Figure 1). There was no statistically significant difference between the transmedia and the comic ($p = .15$). The results partially support H1.

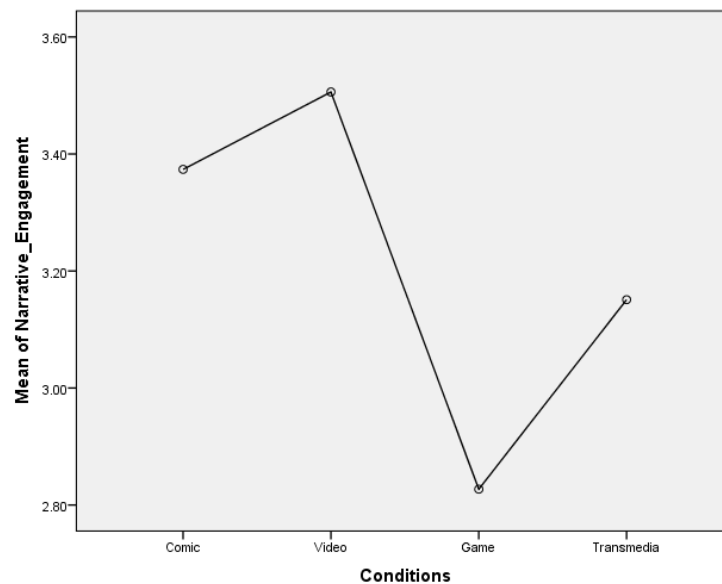


Figure 1. Estimated means for narrative engagement.

The first research question (RQ1) explored how the subdimensions of narrative engagement—specifically narrative understanding, attentional focus, narrative presence, and emotional engagement—differ across transmedia and other single-media groups. A one-way multivariate analysis of variance (MANOVA) was run, and Box's M of 37.56 indicates that the homogeneity of covariance matrices across groups is assumed ($F(30, 330372) = 1.23, p = .18$). The results show a statistically significant difference between subdimensions of narrative engagement across conditions (Wilk's $\Lambda = 0.823, F(12, 916) = 5.84, p < .01, \eta^2 = .06$).

A pairwise comparison revealed that, for the subdimension of *narrative understanding*, transmedia engagement was higher than game engagement ($M.diff = .462, SE = .139, p < .05$), but lower than video engagement ($M.diff = -.391, SE = .143, p < .05$). No statistically significant difference was found between

transmedia and comic ($p = .39$). In the subdimension *attentional focus*, the transmedia engagement was higher than that of the game ($M.diff = .452, SE = .178, p < .05$), but lower than that of the comic ($M.diff = -0.431, SE = 0.179, p < 0.05$). There was no statistically significant difference between transmedia and video ($p = .06$). For both the subdimensions of *narrative presence* and *emotional engagement*, transmedia engagement was lower than that of video ($M.diff = -.301, SE = .144; M.diff = -.381, SE = .148, p < .05$, respectively). However, no statistically significant differences were found between transmedia and comic ($p = .14; p = .37$, respectively) or the game ($p = .06; p = .42$, respectively; see Figure 2).

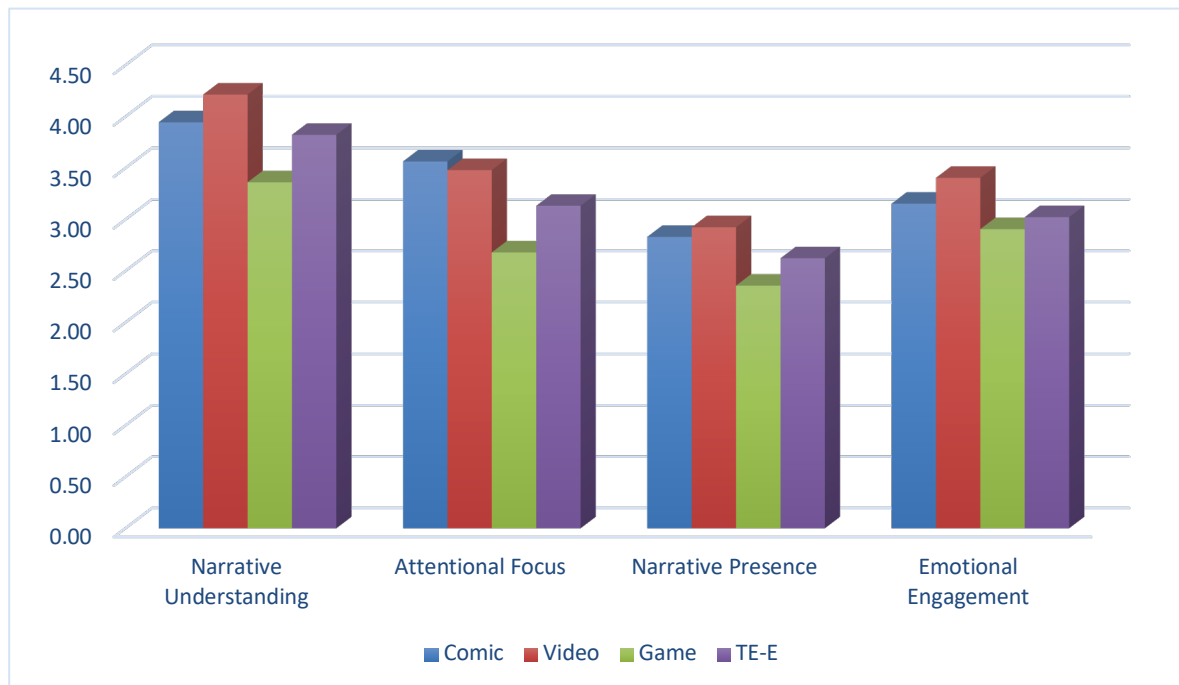


Figure 2. Means of narrative engagement dimensions across conditions.

The first mediation hypothesis (H1b1) assesses whether narrative engagement mediates the relationship between conditions/channels and enjoyment. The SPSS PROCESS macro (Hayes, 2017) was used for the analysis, with a multicategorical independent variable (IV) comparing all groups to a designated "reference group," which, in this case, was transmedia. The type of coding used was an "indicator." Using model 4, bootstrap analysis was run with the default 5,000 iterations. With narrative engagement as the mediator, results indicated that the model significantly predicted enjoyment [$F(4, 348) = 102.30, p < .01, R^2 = .54$]. Specifically, relative to the transmedia, the video condition resulted in higher enjoyment by .38 units, driven by eliciting higher narrative engagement ($B = .38, 95\% \text{ CI of } .14 \text{ to } .62$). Similarly, the comic condition resulted in greater enjoyment by .24 units ($B = .24, 95\% \text{ CI of } .02 \text{ to } .46$). However, the game condition had a negative impact on enjoyment relative to the transmedia by $-.35$ due to lower narrative engagement ($B = -.35, 95\% \text{ CI of } -.59 \text{ to } -.11$; see Figure 3). Thus, we can conclude that the effect of conditions on enjoyment is mediated by narrative engagement, so H1b1 is partially supported.

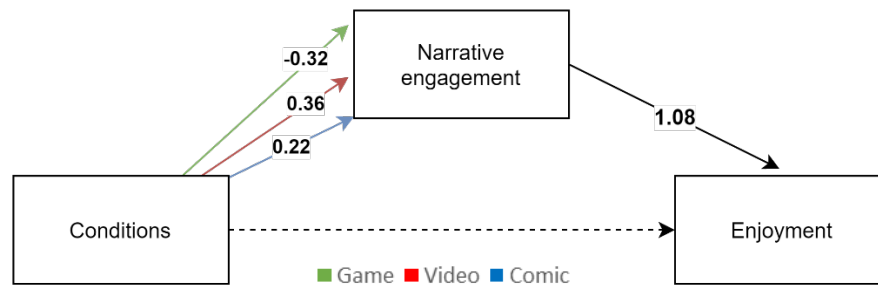


Figure 3. Mediation model with narrative engagement as the mediator.

The second research question (RQ2-1) seeks to investigate the four subdimensions of narrative engagement to enhance understanding of the relationship between conditions/medium and enjoyment, using the same SPSS PROCESS macro for mediation analysis. For the video condition, relative to the transmedia, the video resulted in higher enjoyment because it elicited higher *narrative understanding* ($B = .10$, 95% CI of .02 to .22) and *emotional engagement* ($B = .23$, 95% CI of .05 to .42). However, no significant mediation was established between the video and *attentional focus* or *narrative presence*. For the comic condition, relative to the transmedia, it led to higher enjoyment because reading the comic resulted in high *attentional focus* ($B = .24$, 95% CI of .04 to .44). However, no significant mediation was established between the comic and the three subdimensions: *narrative understanding*, *narrative presence*, and *emotional engagement*. For the game condition, relative to the transmedia, it had a significantly lower effect on enjoyment because playing the game resulted in lower *narrative understanding* ($B = -.12$, 95% CI of $-.23$ to $-.04$) and lower *attentional focus* ($B = -.25$, 95% CI of $-.46$ to $-.05$). However, no significant mediation was established between the game and *narrative presence* or *emotional engagement*.

To test the second mediation hypothesis (H1b2), the same SPSS PROCESS macro was used to assess whether narrative engagement mediates the relationship between conditions/channels and attitudes. With narrative engagement as the mediator, the results indicated that the model significantly predicted attitudes [$F(4, 348) = 14.04$, $p < .01$, $R^2 = .14$]. Specifically, relative to the transmedia, the video condition resulted in higher attitudes by .09 units because it evoked higher narrative engagement ($B = .09$, 95% CI of .03 to .16). Similarly, the comic condition resulted in stronger attitudes by .06 units ($B = .06$, 95% CI of .01 to .12). However, the game condition had a negative effect on attitudes than the transmedia by $-.08$ units because it resulted in lower narrative engagement ($B = -.08$, 95% CI of $-.15$ to $-.03$; see Figure 4). Thus, we can conclude that the effect of conditions on attitudes is mediated by narrative engagement, so H1b2 was partially supported.

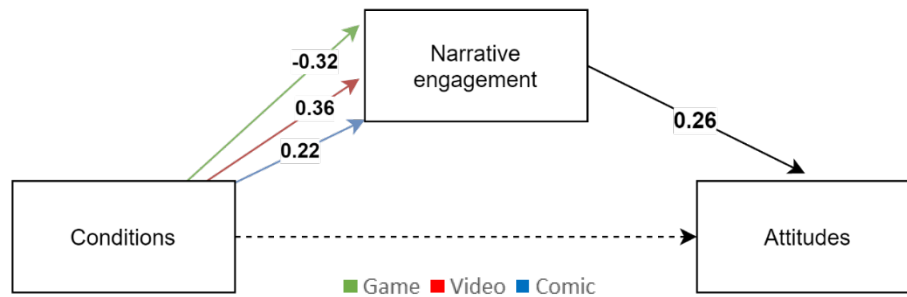


Figure 4. Mediation model 2 with narrative engagement as the mediator.

The second part of (RQ2-2) seeks to investigate the four subdimensions of narrative engagement to enhance understanding of the relationship between conditions/medium and attitudes, using the same SPSS PROCESS macro for mediation analysis. For the video condition, relative to the transmedia, the video resulted in stronger attitudes because it elicited higher *narrative understanding* ($B = .07$, 95% CI of .02 to .14) and *emotional engagement* ($B = .04$, 95% CI of .00 to .10). Yet, no significant mediation was established between the video and *attentional focus* or *narrative presence*. For the comic condition, relative to the transmedia, it led to stronger attitudes because reading the comic resulted in a high *attentional focus* ($B = .06$, 95% CI of .01 to .12). However, no significant mediation was established between the comic and the three subdimensions: *narrative understanding*, *narrative presence*, and *emotional engagement*. For the game condition, relative to the transmedia, it had a significantly negative effect on attitudes because playing the game resulted in lower *attentional focus* ($B = -.06$, 95% CI of $-.12$ to $-.01$) and lower *narrative understanding* ($B = -.09$, 95% CI of $-.15$ to $-.03$). Yet, no significant mediation was established between the game and *narrative presence* or *emotional engagement*.

Counterargument

The second set of hypotheses studied counterarguments, specifically H2, aimed to examine counterarguments and behavioral intentions across the transmedia, video, game, and comic. Thus, a one-way MANOVA was run, and Box's M of 21.21 indicates that the homogeneity of covariance matrices across groups was not met ($F(12, 1382602) = 1.75$, $p = .05$). Thus, Pillai's trace was used instead of Wilks Lambda. The results suggest that there is a statistically significant difference between counterarguments and behavioral intentions across conditions (Pillai's trace = 0.09, $F(8, 872) = 4.85$, $p < .01$, $\eta^2 = .043$). A pairwise comparison revealed that the transmedia resulted in fewer counterarguments than the comic ($M.diff = -.246$, $SE = .109$, $p < .05$), the game ($M.diff = -.202$, $SE = .108$, $p < 0.1$), and the control ($M.diff = -.356$, $SE = .110$, $p < .05$; see Figure 5). Yet no statistically significant difference was found between transmedia and video ($p = .15$). Regarding behavioral intentions, the transmedia resulted in higher behavioral intentions than the comic ($M.diff = .169$, $SE = .085$, $p < .05$) and the control ($M.diff = .426$, $SE = .085$, $p < .05$). Yet, no significant difference was found between transmedia and video ($p = .96$) or game ($p = .47$). The results partially support H2.

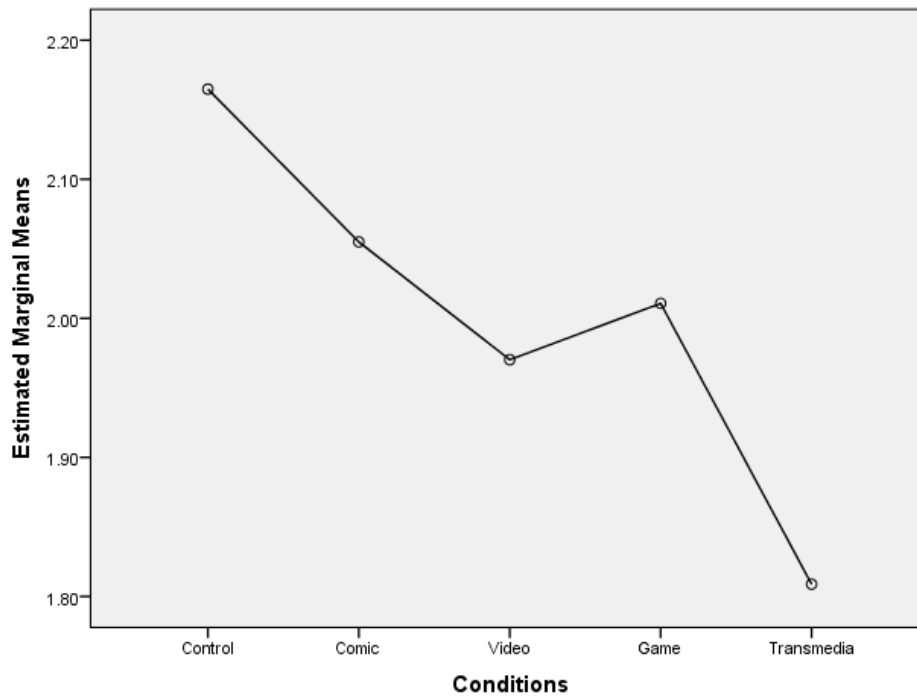


Figure 5. Estimated means for counterargument.

The third mediation analysis (H3) was run using the same SPSS PROCESS macro to evaluate whether narrative engagement mediates the relationship between conditions/channels and counterarguments. With narrative engagement as the mediator, the results indicated that the model significantly predicted counterargument [$F(4, 348) = 11.73, p < .01, R^2 = .12$]. The analysis showed that relative to the transmedia, the video condition resulted in a higher counterargument when mediated through narrative engagement ($B = .12, 95\% \text{ CI of } .05 \text{ to } .21$). The same applied to the comic ($B = .07, 95\% \text{ CI of } .01 \text{ to } .16$). However, the game condition had a lower reduced counterargument relative to transmedia ($B = -.11, 95\% \text{ CI of } -.20 \text{ to } -.03$; see Figure 6). Thus, we can conclude that the effect of conditions on counterarguments was mediated by narrative engagement. TE-E resulted in fewer counterarguments than the video and comic, partially supporting H3.

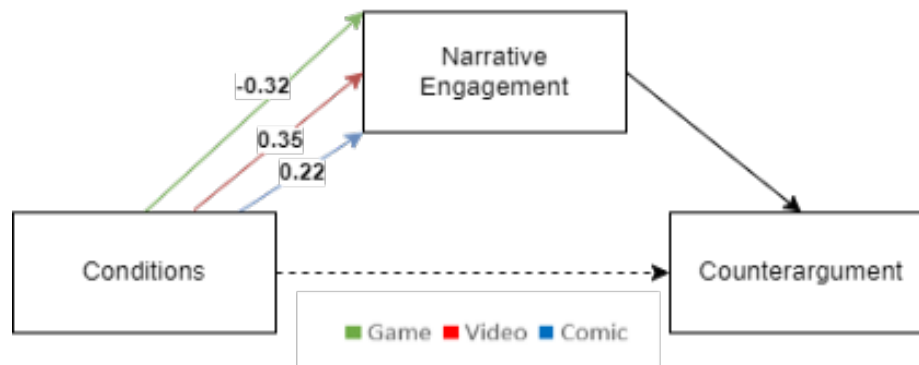


Figure 6. Mediation model 2 with narrative engagement as the mediator.

Discussion

This study integrates E-E literature and narrative persuasion theories to explore TE-E as an innovative communication approach, examining its persuasive outcomes and narrative processing mechanisms, specifically counterargument and narrative engagement, compared with single narrative presentations. The goal is to determine how effective a transmedia approach is in shaping attitudes and behavioral intentions toward SD and its potential for driving social change.

Counterargument and Repeated Exposure

Counterarguing, or cognitive resistance, plays a crucial role in understanding the narrative persuasion of TE-E. One key finding was that TE-E resulted in relatively fewer counterarguments than a single medium. This reduction in counterarguing is critical for influencing the audience's beliefs, attitudes, and behaviors toward SD. There are several explanations for this reduction; one justification is the subtle narrative approach inherent in TE-E. Consistent with past research, E-E-based narratives reduce counterarguments through an implicit, subtle form of persuasion because engaging and being immersed in the narrative can avoid resistance and forget that the message is persuasive (Moyer-Gusé & Nabi, 2010). When people are immersed in the narrative, they become less critical, less likely to counterargue, and thus easier to influence (Slater & Rouner, 2002). Based on our results, TE-E builds on E-E principles and shares the same subtle approach to persuasion. Hence, presenting multiple narratives across multiple platforms in the TE-E leads to less resistance and enhances message reinforcement.

In addition, EORM supports the notion that the subtle approach in E-E narratives is less likely to induce psychological reactance, while explicit messages evoke greater perceptions of persuasive intent, resulting in more negative reactance and resistance (Moyer-Gusé, 2008). Consistent with past research, explicit messages in environmental narratives undermine the subtle nature of the narrative by evoking greater perceived persuasive intent, resulting in more negative reactance and resistance (Moyer-Gusé et al., 2019). Furthermore, our findings showed that TE-E featured stories of heroes for change and focused on successful sustainable initiatives, evoking emotional arousal and inspiration, while making the audience less critical and more receptive across various platforms. This aligns with research on the effectiveness of

science communication videos, which has found that their narrative evoked strong emotional arousal, making viewers less critical (Huang & Grant, 2020). Therefore, TE-E narratives can effectively influence audiences by subtly reducing counterarguing compared with a traditional single narrative, making them more receptive to messages about sustainability.

Repeated narrative exposure and reinforcement across platforms offer another possible explanation for our finding that TE-E results in less counterarguing than a single medium. Previous research has shown that frequent exposure to a persuasive narrative across different platforms not only enhances message reinforcement but also intensifies the audience's experience with the content and its embedded narrative (Jenkins, 2003). This is because each platform generates an experience that complements and reinforces content on other platforms, making the audience more receptive to the message rather than resistant (Selvadurai et al., 2022). Similarly, in our TE-E, the video, game, and comic experiences complement one another, reinforcing the narrative about sustainability. Furthermore, repeated exposure to the story world helps to construct a mental model in the audience; when they encounter similar/relevant narratives across different platforms, the message feels familiar to the user/viewer. This familiarity reduces cognitive effort in processing the narrative by minimizing the need for critical evaluation of the content, thereby reducing resistance (Green et al., 2008). It also increases engagement, allowing the audience to notice new aspects of the story or gain a deeper understanding, further diminishing the likelihood of counterarguing.

This process is particularly effective because it promotes emotional involvement. Past research has found that repeated exposure to narrative content across platforms increases emotional involvement (Green et al., 2008), enhances the salience of the issue (Eden et al., 2014), and positively influences attitudes, efficacy, and behavioral intentions (Van Laer, De Ruyter, Visconti, & Wetzels, 2014). Emotional engagement fosters a stronger connection with the message, reducing resistance and counterarguing. Additionally, it enhances memory retention and heightens the anticipation of enjoyable moments, which further reduces the cognitive resources needed for critical processing (Quintero-Johnson & Sangalang, 2017). Together, these cognitive and emotional factors contribute to reduced message resistance in TE-E, making the audience more receptive to the message about sustainability and more likely to internalize and embrace it.

Another important finding was that our experiment emphasizes "transmedial reinforcement," not message repetition. While there is a fine line between reinforcement and repetition in TE-E, this distinction can lead to less resistance and greater message acceptance. By transmedial reinforcement, we mean that the same overarching story world message of "promoting SDGs" is reinforced in different ways across different stories using various platforms. This approach allows us to echo the overall idea, the central theme, and the overarching message within one big story world or expansive narrative, rather than merely repeating identical messages. For example, we are not repeatedly saying, "Reduce food waste," but promoting adopting sustainable practices. This difference is essential because repetitive messages can cause boredom and annoyance, whereas transmedial reinforcement enhances message acceptance and reduces resistance.

Narrative Engagement

Despite TE-E's effectiveness in reducing counterarguments, the video fostered strong narrative engagement with the sustainability narratives. Specifically, we found that the TE-E exhibited higher

narrative engagement than the game but lower than the video, and that the comic was mostly insignificant. One likely explanation is that the video condition elicited the highest enjoyment levels, making the participants more receptive to the persuasive message on sustainability. In contrast, games and comics might require more effort and time to follow the storyline, which likely reduced overall TE-E engagement. Past research indicates that enjoyment leads to a more positive narrative evaluation (Bilandzic & Busselle, 2011). Viewers who enjoy media content tend to engage with it more and are likely to maintain consistent beliefs about it.

Our mediation analyses further confirmed that narrative engagement strongly mediated the relationship between conditions and enjoyment, explaining 54% of the variance in the relationship. Specifically, the results indicated that the video and comic conditions resulted in higher enjoyment than transmedia, while the game resulted in less enjoyment. This can be attributed to the fact that participants preferred the videos because they enjoyed the stories of young people worldwide driving positive change through sustainable initiatives. This emotional connection helped convey and promote the sustainability message more effectively and allowed participants to retain information better than the game, where many participants skipped the narrative, likely diminishing its persuasive potential. Given that the audience liked the video but not the game, it could negatively affect the perceptions and outcomes of TE-E as it includes both. This aligns with past research that found engagement with a video narrative on learning the Spanish language/culture resulted in high enjoyment levels and improved learning outcomes (Benitez-Galbraith & Galbraith, 2019).

According to our study findings, the higher narrative engagement observed in the video compared with the TE-E can be attributed to the lack of unified characters across the TE-E, which results in lower character identification. This difference in engagement is further clarified by the distinction between two types of transmedia, *intra-compositional* and *inter-compositional*, which vary in their narrative connectivity and, consequently, their impact on narrative engagement (Dena, 2009). The *intra-compositional* transmedia is a single-story world with the same characters distributed across different platforms, offering a more unified and connected narrative, while *inter-compositional* transmedia, as seen in this study, consists of independent yet interconnected stories featuring diverse characters that can be consumed separately, leading to a fragmented/loose narrative and less character identification, which reduces emotional and narrative engagement. This suggests that different types of transmedia may not be equally effective due to varying degrees of narrative connectivity. This aligns with past research, which suggests that TE-E featuring the same characters across different platforms can strengthen narrative engagement (Munaro & Vieira, 2016; Wang & Singhal, 2016) because participants relate emotionally to the characters in the TE-E, and this emotional involvement boosts the characters' relatability and appropriateness, ultimately fostering sustained engagement (Heilemann et al., 2018). This explains our finding that the TE-E had less emotional engagement than the video due to the absence of unified characters that the audience can identify with. Previous research further supports this, showing that the cultural authenticity of the characters in TE-E, *East Los High*, led to stronger character identification, which increased the audience's narrative engagement (Wang et al., 2019).

Further analysis of the subdimensions of narrative engagement in sustainability highlighted the strengths and weaknesses of the narrative engagement mechanisms for all the conditions. For instance, the

video was engaging, particularly in the subdimensions of narrative understanding and emotional engagement, suggesting that the audience both comprehended the sustainability narrative and felt emotionally connected to it, likely due to stronger character identification and high levels of enjoyment. However, the game suffered low engagement because of low narrative understanding and attentional focus subdimensions, indicating that the audience did not understand the game and were easily distracted from the narrative, probably because they skipped the narrative. Given that both the video and the game are part of the TE-E, the mixed responses to these components may negatively impact TE-E's overall narrative engagement. Additionally, the narrative presence subdimension was the lowest, suggesting that participants were not immersed in the narrative, probably because the use of animated characters can reduce realism (Shata & Seelig, 2025). Overall, the narrative provided across different platforms was more informational than emotional, which reduced narrative engagement. Thus, future TE-E should be carefully developed to build a stronger emotional connection between the audience and the narrative.

Limitations

Among the limitations of this study is that it focuses on the overall transmedia experience compared with a single-media experience and does not compare the influence of intermedia repetition or dose effect, which is a good suggestion for future studies. Furthermore, some confounding effects from the story quality, synergy level, or information richness vary from one case/story to another to see if these affect the outcomes. Moreover, the likes/dislikes of a specific platform can transfer to the transmedia, making it hard to measure TE-E's true impact. Additionally, experimenting online may have impacted the participants' levels of attention and engagement with the content (Rodd, 2024).

The study primarily focused on Gen Z participants, which may limit the generalizability of the findings to other age groups or demographics. It also specifically examined SD, and the results can vary depending on the issue presented. Additionally, the study examined TE-E using specific platforms such as videos, games, and comics. However, other forms of media, such as social media platforms, interactive websites, podcasts, or virtual reality, may engage the audience in different ways. Therefore, to enhance the external validity of the study, future research should broaden the sample to include diverse age groups, cultural backgrounds, geographic locations, and a wider range of media platforms and social change topics.

Implications

Regarding the theoretical implications, this study advances our understanding of how TE-E functions as a communication strategy for promoting SD. It extends and bridges the theories of narrative persuasion and E-E by offering a comprehensive understanding of how these frameworks work together in a transmedia context to promote SD. While much of the existing literature focuses on single-medium narratives, this study explores the impact of transmedia multi-platforms on audience engagement with sustainability narratives, a relatively underexplored area. Findings show support for E-ELM and EORM models but suggest revisiting narrative engagement theories in the context of TE-E. By examining both cognitive (counterarguing) and emotional (engagement) narrative processing mechanisms, this study refines our understanding of how narrative structures across platforms can effectively reduce resistance

to persuasive messages. However, it also highlights challenges in maintaining an emotional connection with SD issues, indicating that emotional engagement may be harder to sustain in transmedia formats. Furthermore, this study discusses different types of transmedia and offers insights into the role of narrative connectivity and consistency of characters, suggesting that future research should investigate the role of identification theory in transmedia narratives and its potential contribution to persuasive outcomes. Overall, this study offers new perspectives on how transmedia narratives affect audience engagement, persuasion, and behavioral change, thus advancing research on media effects, particularly in the context of SD communication.

Nevertheless, these findings have broader practical implications that expand our understanding of how TE-E can inform advocates on designing, planning, and implementing a successful intervention using TE-E. Given the more favorable engagement of the video condition, participants enjoyed the embedded narrative and the visual elements, while the comic was static; this suggests that Gen Z enjoys interactive narratives, as they would rather listen to or watch a video narrative than read long story texts. Thus, we recommend using more interactive, visually rich platforms as effective media choices for Gen Z. For message design, short narratives and human characters are recommended, while long text-based storylines should be avoided to prevent skipping or message fatigue.

Future Research

Future research should consider expanding on the effects of repeated narrative exposure to understand its role in narrative persuasion in TE-E. Also, examine the role of character identification in transmedia persuasion and empirically test narratives of different levels of connectivity to determine if it has more persuasive outcomes for TE-E. Although the participants' level of environmental consciousness or interest in the topic did not affect the results, future research must consider the role and impact of their prior knowledge or interest.

Conclusion

This research is one of the few empirical investigations examining the role and persuasive effects of TE-E as a communication approach advocating for SD. It extends the narrative persuasion literature and establishes a theoretical framework to understand the persuasive mechanisms of TE-E compared with individual narrative forms like a video, game, or comic. The findings suggest that TE-E effectively minimizes counterarguments compared with other conditions because it shares the same subtle persuasion as E-E to suppress counterarguments, making it more effective than overt persuasion. In addition, repeated narrative exposure across multiple platforms (transmedial reinforcement) leads to message reinforcement and further reduces resistance. However, regarding narrative engagement, Gen Z prefers videos because they enjoy the narrative and the dynamic visual elements. In contrast, they often find static comics less engaging and perceive the game's lengthy narrative as unclear and cumbersome, negatively affecting TE-E's effectiveness. These preferences highlight the importance of concise storytelling and interactive content, which may resonate more effectively with Gen Z.

References

- Alonso-Jurnet, Á., & Larrondo-Ureta, A. (2024). Hashtivism as media discourse: Analysing pioneer environmental action in Public Service Media through transmedia formula. *Communication & Society, 37*(4), 21–37. doi:10.15581/003.37.4.21-37
- Armstrong, R. A. (2019). Is there a large sample size problem? *Ophthalmic and Physiological Optics, 39*(3), 129–130. doi:10.1111/oppo.12618
- Atarama-Rojas, T., & Feijoo, B. (2023). Social audience and emotional bonding in marvel's transmedia phenomenon: An exploration of Peruvian digital communities. *International Journal of Communication, 17*, 3054–3071.
- Benitez-Galbraith, J., & Galbraith, C. S. (2019). Narrative engagement, enjoyment, learning and theme comprehension: Using an authentic music video in an introductory college language classroom. *RELC Journal, 52*(3), 1–15. doi:10.1177/0033688219874136
- Bilandzic, H., & Busselle, R. W. (2011). Enjoyment of films as a function of narrative experience, perceived realism and transportability. *Communications, 36*(1), 29–50. doi:10.1515/comm.2011.002
- Busselle, R., & Bilandzic, H. (2009). Measuring narrative engagement. *Media Psychology, 12*(4), 321–347. doi:10.1080/15213260903287259
- Chattoo, C., & Feldman, L. (2017). Storytelling for social change: Leveraging documentary and comedy for public engagement in global poverty. *Journal of Communication, 67*(5), 678–701. doi:10.1111/jcom.12318
- Chen, T., & Lin, J. S. (2014). Entertainment-education of altruistic behaviors: An empirical study of the effects of the narrative persuasion of a nature conservation film. *Chinese Journal of Communication, 7*(4), 373–388. doi:10.1080/17544750.2014.946430
- Coles, J. N. (2024). Potential applications of transmedia storytelling for fostering SDG awareness and action. In I. Pereira, P. Pires, & J. Santos (Eds.), *Effective digital marketing for improving society behavior toward DEI and SDGs* (pp. 104–122). Hershey, PA: IGI Global.
- Confetto, M., Covucci, C., Addeo, F., & Normando, M. (2023). Sustainability advocacy antecedents: How social media content influences sustainable behaviours among Generation Z. *Journal of Consumer Marketing, 40*(6), 758–774. doi:10.1108/JCM-11-2021-5038
- Coombs, W., & Holladay, S. (2021). The why and how for storytelling: The TNT approach applied to sustainability communication. In F. Weder, L. Krainer, & M. Karmasin (Eds.), *The sustainability communication reader: A reflective compendium* (pp. 89–102). Wiesbaden, Germany: Springer. doi:10.1007/978-3-658-31883-3_6

- Dena, C. (2009). *Transmedia practice: Theorising the practice of expressing a fictional world across distinct media and environments* (Unpublished doctoral dissertation). University of Sydney, Sydney, Australia.
- Eden, A., Tamborini, R., Grizzard, M., Lewis, R., Weber, R., & Prabhu, S. (2014). Repeated exposure to narrative entertainment and the salience of moral intuitions. *Journal of Communication, 64*(3), 501–520. doi:10.1111/jcom.12098
- Ferreira, M., Nunes, N., & Nisi, V. (2021). Interacting with climate change: A survey of HCI and design projects and their use of transmedia storytelling. In *Proceedings of the International Conference on Interactive Digital Storytelling* (pp. 338–348). Tallinn, Estonia: ICIDS. doi:10.1007/978-3-030-92300-6_33
- Gambarato, R. (2013). Transmedia project design: Theoretical and analytical considerations. *Baltic Screen Media Review, 1*(1), 80–100. doi:10.1515/bsmr-2015-0006
- Gambarato, R., & Medvedev, S. A. (2017). Transmedia storytelling impact on government policy change. In Y. Ibrahim (Ed.), *Politics, protest, and empowerment in digital spaces* (pp. 31–51). Hershey, PA: IGI Global.
- Ghouse, S. M., Shekhar, R., & Chaudhary, M. (2024). Sustainable choices of Gen Y and Gen Z: Exploring green horizons. *Management & Sustainability: An Arab Review*. Advance online publication. doi:10.1108/MSAR-04-2024-0018
- Global Goals. (2015). *Introducing the global goals*. Retrieved from <https://worldslargestlesson.globalgoals.org/introduce-the-global-goals/>
- Green, M. C., & Clark, J. L. (2013). Transportation into narrative worlds: Implications for entertainment media influences on tobacco use. *Addiction, 108*(3), 477–484. doi:10.1111/j.1360-0443.2012.04088.x
- Green, M. C., & Jenkins, K. M. (2014). Interactive narratives: Processes and outcomes in user-directed stories. *Journal of Communication, 64*(3), 479–500. doi:10.1111/jcom.12093
- Green, M. C., Kass, S., Carrey, J., Herzig, B., Feeney, R., & Sabini, J. (2008). Transportation across media: Repeated exposure to print and film. *Media Psychology, 11*(4), 512–539. doi:10.1080/15213260802492000
- Hayes, A. F. (2017). *Introduction to mediation, moderation, and conditional process analysis: A regression-based approach*. New York, NY: Guilford Publications.

- Heilemann, M. V., Martinez, A., & Soderlund, P. D. (2018). A mental health storytelling intervention using transmedia to engage Latinas: Grounded theory analysis of participants' perceptions of the story's main character. *Journal of Medical Internet Research, 20*(5), 1–13. Retrieved from <https://www.jmir.org/2018/5/e10028/>
- Huang, T., & Grant, W. J. (2020). A good story well told: Storytelling components that impact science video popularity on YouTube. *Frontiers in Communication, 5*, 1–15. doi:10.3389/fcomm.2020.581349
- Jenkins, H. (2003, January 15). Transmedia storytelling: Moving characters from books to films to video games can make them stronger and more compelling. *MIT Technology Review*. Retrieved from <https://www.technologyreview.com/2003/01/15/234540/transmedia-storytelling/>
- Jensen, K. B. (2022). *Media convergence: The three degrees of network, mass, and interpersonal communication*. New York, NY: Routledge.
- Jørgensen, K. M., & Boje, D. M. (2020). Storytelling sustainability in problem-based learning. In R. V. Turcan & J. E. Reilly (Eds.), *Populism and higher education curriculum development: Problem based learning as a mitigating response* (pp. 369–391). Cham, Switzerland: Palgrave Macmillan. doi:10.1007/978-3-030-47376-1_15
- Kalinov, K. (2017). Transmedia narratives: Definition and social transformations in the consumption of media content in the globalized world. *Postmodernism Problems, 7*(1), 60–68. Retrieved from <https://pmpjournal.org/index.php/pmp/article/view/54>
- Kim, K., Lee, M., & Macias, W. (2014). An alcohol message beneath the surface of ER: How implicit memory influences viewers' health attitudes and intentions using entertainment-education. *Journal of Health Communication, 19*(8), 876–892. doi:10.1080/10810730.2013.837556
- Kustritz, A. (2022). Transmediating difference: Fictional filter bubbles and transmedia storytelling. *Convergence, 28*(3), 699–713. doi:10.1177/13548565211029724
- Lee, N. M., VanDyke, M. S., & Cummins, R. G. (2018). A missed opportunity?: NOAA's use of social media to communicate climate science. *Environmental Communication, 12*(2), 274–283. doi:10.1080/17524032.2016.1269825
- Lowery, B., Dagevos, J., Chuenpagdee, R., & Vodden, K. (2020). Storytelling for sustainable development in rural communities: An alternative approach. *Sustainable Development, 28*(6), 1813–1826. doi:10.1002/sd.2124
- Lutkenhaus, R., Jansz, J., & Bouman, M. (2019). Toward spreadable entertainment-education: Leveraging social influence in online networks. *Health Promotion International, 35*(5), 1241–1250. doi:10.1093/heapro/daz104

- Ma, Z. (2020). Effects of immersive stories on prosocial attitudes and willingness to help: Testing psychological mechanisms. *Media Psychology, 23*(6), 865–890. doi:10.1080/15213269.2019.1651655
- McCormack, C. M., Martin, J., & Williams, K. J. (2021). The full story: Understanding how films affect environmental change through the lens of narrative persuasion. *People and Nature, 3*(6), 1193–1204. doi:10.1002/pan3.10259
- Michalos, A. C., Creech, H., Swayze, N., Kahlke, P. M., Buckler, C., & Rempel, K. (2012). Measuring knowledge, attitudes and behaviours concerning sustainable development among tenth grade students in Manitoba. *Social Indicators Research, 106*(2), 213–238. doi:10.1007/s11205-011-9809-6
- Moore, M. M., & Yang, J. Z. (2020). Using eco-guilt to motivate environmental behavior change. *Environmental Communication, 14*(4), 522–536. doi:10.1080/17524032.2019.1692889
- Moyer-Gusé, E. (2008). Toward a theory of entertainment persuasion: Explaining the persuasive effects of entertainment-education messages. *Communication Theory, 18*(3), 407–425. doi:10.1111/j.1468-2885.2008.00328.x
- Moyer-Gusé, E., & Dale, K. (2017). Narrative persuasion theories. In P. Rössler (Ed.), *The international encyclopedia of media effects* (pp. 1345–1355). Hoboken, NJ: Wiley-Blackwell.
- Moyer-Gusé, E., & Nabi, R. L. (2010). Explaining the effects of narrative in an entertainment television program: Overcoming resistance to persuasion. *Human Communication Research, 36*(1), 26–52. doi:10.1111/j.1468-2958.2009.01367.x
- Moyer-Gusé, E., Tchernev, J. M., & Walther-Martin, W. (2019). The persuasiveness of a humorous environmental narrative combined with an explicit persuasive appeal. *Science Communication, 41*(4), 422–441. doi:10.1177/1075547019862553
- Munaro, A., & Vieira, A. (2016). Use of transmedia storytelling for teaching teenagers. *Creative Education, 7*(07), 1007–1017. doi:10.4236/ce.2016.77105
- Nabi, R. L., Moyer-Gusé, E., & Byrne, S. (2007). All joking aside: A serious investigation into the persuasive effect of funny social issue messages. *Communication Monographs, 74*(1), 29–54. doi:10.1080/03637750701196896
- Parker, K., & Igielink, R. (2020, May 14). *On the cusp of adulthood and facing an uncertain future: What we know about gen z so far*. Pew Research Center. Retrieved from <https://www.pewsocialtrends.org/essay/on-the-cusp-of-adulthood-and-facing-an-uncertain-future-what-we-know-about-gen-z-so-far/>

- Peña, E., & James, K. (2023). A framework of transmediation. *Convergence*, 30(5), 1610–1624. doi:10.1177/13548565231220325
- Quintero-Johnson, J. M., & Sangalang, A. (2017). Testing the explanatory power of two measures of narrative involvement: An investigation of the influence of transportation and narrative engagement on the process of narrative persuasion. *Media Psychology*, 20(1), 144–173. doi:10.1080/15213269.2016.1160788
- Rodd, J. M. (2024). Moving experimental psychology online: How to obtain high quality data when we can't see our participants. *Journal of Memory and Language*, 134, 104472. doi:10.1016/j.jml.2023.104472
- Ruggerio, C. (2021). Sustainability and sustainable development: A review of principles and definitions. *Science of the Total Environment*, 786, 147481. doi:10.1016/j.scitotenv.2021.147481
- Sangalang, A., Quintero-Johnson, J. M., & Ciancio, K. E. (2013). Exploring audience involvement with an interactive narrative: Implications for incorporating transmedia storytelling into entertainment-education campaigns. *Critical Arts*, 27(1), 127–146. doi:10.1080/02560046.2013.766977
- Scolari, C. A. (2013). Lostology: Transmedia storytelling and expansion/compression strategies. *Semiotica*, 195, 45–68. doi:10.1515/sem-2013-0038
- Selvadurai, V., Vistisen, P., & Binns, D. (2022). Bridge complexity as a factor in audience interaction in transmedia storytelling. *Journal of Asia-Pacific Pop Culture*, 7(1), 85–108. Retrieved from <https://muse.jhu.edu/article/857654>
- Shata, A., & Seelig, M. (2025). Is it real enough? A mixed-methods study of realism, engagement and counterargument in transmedia edutainment for sustainable behaviors. *Communication & Society*. Advance online publication. doi:10.15581/003.38.1.010
- Singhal, A., & Rogers, E. M. (2012). *Entertainment-education: A communication strategy for social change*. New York, NY: Routledge.
- Slater, M. D., & Rouner, D. (2002). Entertainment—Education and elaboration likelihood: Understanding the processing of narrative persuasion. *Communication Theory*, 12(2), 173–191. doi:10.1111/j.1468-2885.2002.tb00265.x
- Suryaputra, R., Daryanti, S., & Setyowardhani, H. (2024). The role of social media in promoting sustainable green lifestyles: Influencers and value co-creation with Gen Z in Indonesia. *Journal of Entrepreneurial Economic*, 1(1), 45–62. doi:10.61511/jane.v1i1.2024.1036

- Swim, J. K., Aviste, R., Lengieza, M. L., & Fasano, C. J. (2022). OK boomer: A decade of generational differences in feelings about climate change. *Global Environmental Change, 73*(1), 102479. doi:10.1016/j.gloenvcha.2022.102479
- Tal-Or, N., & Cohen, J. (2010). Understanding audience involvement: Conceptualizing and manipulating identification and transportation. *Poetics, 38*(4), 402–418. doi:10.1016/j.poetic.2010.05.004
- Tárcia, L., Alzamora, G., Cunha, L., & Gambarato, R. (2023). Transmedia educommunication method for social sustainability in low-income communities. *Frontiers in Communication, 8*, 107780. doi:10.3389/fcomm.2023.1077807
- United Nations Sustainable Development Goals. (2015). *Transforming our world: The 2030 agenda for sustainable development*. Retrieved from <https://sustainabledevelopment.un.org/content/documents/21252030%20Agenda%20for%20Sustainable%20Development%20web.pdf>
- Van Laer, T., De Ruyter, K., Visconti, L. M., & Wetzels, M. (2014). The extended transportation-imagery model: A meta-analysis of the antecedents and consequences of consumers' narrative transportation. *Journal of Consumer Research, 40*(5), 797–817. doi:10.1086/673383
- Vantamay, N. (2019). "3S Project": A community-based social marketing campaign for promoting sustainable consumption behavior among youth. *Jurnal Komunikasi: Malaysian Journal of Communication, 35*(4), 32–49. Retrieved from <http://103.219.237.47/mjc/article/viewFile/23612/10081>
- Von Stackelberg, P., & Jones, R. E. (2014). Tales of our tomorrows: Transmedia storytelling and communicating about the future. *Journal of Futures Studies, 18*(3), 57–76. Retrieved from <https://jfsdigital.org/articles-and-essays/2014-2/vol-18-no-3-march-2014/articles/tales-of-our-tomorrows-transmedia-storytelling-and-communicating-about-the-future/>
- Wang, H., & Singhal, A. (2016). East Los High: Transmedia edutainment to promote the sexual and reproductive health of young Latina/o Americans. *American Journal of Public Health, 106*(6), 1002–1010. Retrieved from <https://ajph.aphapublications.org/doi/abs/10.2105/AJPH.2016.303072>
- Wang, H., Singhal, A., Quist, C., Sachdev, A., & Liu, S. (2019). Aligning the stars in East Los High: How authentic characters and storylines can translate into real-life changes through transmedia edutainment. *Journal of Media and Communication Research, 11*(3), 1–22. Retrieved from <http://hdl.handle.net/11250/2645697>

Williams, A., Zraik, D., Schiavo, R., & Hatz, D. (2008). Raising awareness of sustainable food issues and building community via the integrated use of new media with other communication approaches. *Cases in Public Health Communication & Marketing, 2*, 159–177. Retrieved from www.casesjournal.org/volume2

World Rescue. (2017). *World Rescue game website*. Retrieved from <http://worldrescuegame.com/>

Yang, S., & Zhang, W. (2022). Presence and flow in the context of virtual reality storytelling: What influences enjoyment in virtual environments? *Cyberpsychology, Behavior, and Social Networking, 25*(2), 101–109. doi:10.1089/cyber.2021.0037