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EDITED BY

Anabela Carvalho,
University of Minho, Portugal

REVIEWED BY

Gail Ferguson,
University of Minnesota Twin Cities,
United States
Monica Truninger,
University of Lisbon, Portugal

*CORRESPONDENCE

Irwanto Irwanto
✉ irwanto001@binus.ac.id

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Beyond behavioral change: evaluating the impact of environmental films on audience perceptions and beliefs about food system issues

Nayla Majestya and Irwanto Irwanto*

Film Department, School of Design, Binus University, Jakarta, Indonesia

This study examines the effects of environmental films on audience beliefs and perceptions regarding food system issues. Specifically, it evaluates the impact of viewing documentary *Food, Inc.* and fictional film *Okja* on undergraduate film students. Using a Stimulus-Organism-Response framework, the researchers conducted pre- and post-questionnaires to measure participant motivations, beliefs, and perceptions. Statistical analysis using paired-sample t-tests revealed no significant differences in belief evaluations before and after viewing either film. However, both films observed substantial changes in perception assessments, with *Okja* demonstrating a stronger effect than *Food, Inc.* The study found that while both films increased audience knowledge about food systems and sustainability issues, they did not significantly alter food consumption habits. Instead, the films functioned as moral fables, providing a foundation for environmental ethics rather than directly influencing behavior. *Food, Inc.* primarily addressed instrumental-value ecological ethics, focusing on human health and business practices, while *Okja* emphasized intrinsic-value ethics, particularly animal rights. The research challenges the notion that environmental films' primary purpose is to change audience behavior directly, arguing instead that they serve as a form of ecological communication with distinct moral and political agendas. The study concludes that these films engage in moral pedagogy to promote environmental ethics by narrating injustices in the existing food system, ultimately aiming to influence social change through policies rather than individual actions. This research contributes to understanding the nuanced effects of environmental films on audience perceptions and beliefs, highlighting the importance of considering both media logic and media effects in analyzing their impact.

KEYWORDS

environmental film, food system, media effects, environmental ethics, audience perception

1 Introduction

Environmental communication through media plays a pivotal role in shaping public understanding of complex ecological challenges. Among these challenges, food system sustainability has emerged as a critical concern with far-reaching implications for human health, environmental integrity, and social justice (Gottlieb and Joshi, 2010; Gordon and Hunt, 2019). The global COVID-19 pandemic has further highlighted vulnerabilities within our food systems, with evidence suggesting connections between industrial agriculture and the emergence of novel pathogens (Huang et al., 2020; Wallace, 2020). In this context,

understanding how media—particularly film—influences public perception of food system issues becomes increasingly important for both scholars and practitioners of environmental communication.

Environmental films represent a significant channel through which audiences engage with complex ecological issues, including those related to food production and consumption. These films serve not merely as entertainment but as vehicles for information dissemination, awareness-raising, and potentially, behavior change (Hughes, 2014). The growing popularity of both documentary and fictional environmental films suggests their cultural resonance, yet their efficacy in shaping audience perceptions and beliefs remains insufficiently understood, particularly regarding food system issues (Lindenfeld, 2010; Smith and Lindenfeld, 2014).

1.1 Media effects in environmental communication

Research on media effects has consistently demonstrated that media exposure significantly influences how audiences perceive and understand environmental issues (Hansen, 2019). Studies by Sampei and Aoyagi-Usui (2009) found that media coverage of climate change issues correlates with increased public awareness, while research by Nisbet (2009) highlighted how media framing shapes public understanding of environmental problems. More recently, Vrselja et al. (2024) documented how exposure to climate change information through media channels significantly influences risk perceptions and subsequent pro-environmental behaviors.

In the specific context of environmental films, several studies have examined their potential to influence audience attitudes and behaviors. Howell (2011) found that viewers of climate change documentaries reported immediate increases in concern and motivation to act, though these effects diminished over time. Similarly, Janpol and Dilts (2016) observed that while documentary films increased environmental awareness, they did not necessarily lead to sustained behavioral changes. These findings suggest a complex relationship between film viewership and environmental engagement that warrants further investigation, particularly regarding the differential impacts of film genres.

Documentary films have traditionally served as primary vehicles for environmental communication (Opel, 2007; Rosteck and Frentz, 2009). Films like *Food, Inc.* (2008) have gained significant popularity for their exploration of food system issues, including “the development of food policy; issues of GMOs; the corn and soybean industries and their relationship to obesity; health concerns; and issues of labor” (Lindenfeld, 2010). However, fiction films have increasingly incorporated environmental themes, offering alternative narrative approaches to ecological messaging. Bong Joon Ho’s works, including *Okja* (2017), exemplify how fictional narratives can engage audiences with environmental issues through compelling storytelling and emotional engagement.

The comparative effectiveness of documentary versus fiction films in shaping environmental perceptions remains underexplored. While documentaries typically emphasize factual information and systemic analysis, fiction films may leverage emotional engagement and character identification to convey environmental messages. This distinction raises important questions about the mechanisms through

which different film genres influence audience perceptions and beliefs about environmental issues, including those related to food systems.

1.2 Theoretical framework: stimulus-organism-response

To examine how environmental films influence audience perceptions and beliefs, this study employs the Stimulus-Organism-Response (S-O-R) framework (Mehrabian and Russell, 1974). Originally developed to understand environmental psychology, the S-O-R model has been extensively applied to media effects research (Peng and Kim, 2014). The model posits that environmental stimuli (S) affect organisms’ internal cognitive and affective states (O), which in turn lead to behavioral responses (R).

In media research, the S-O-R framework has proven particularly valuable for understanding how media content influences audience cognition, emotion, and behavior (Lang, 2000). Leshner et al. (2011) applied this framework to examine how media messages trigger cognitive and emotional processing, while Kim et al. (2020) utilized it to investigate how environmental stimuli in digital contexts affect consumer responses. Specifically regarding environmental communication, Nabi et al. (2018) employed a theoretical framework similar to the S-O-R model to examine how climate change message framing influences emotional responses and subsequent advocacy behavior.

Environmental films function as stimuli that potentially alter viewers’ internal states—their perceptions, beliefs, emotional responses, and knowledge structures—which may subsequently influence their behavioral intentions and actions. Documentaries like *Food, Inc.* and fictional films like *Okja* represent distinct stimuli that may trigger different cognitive and affective processes, potentially leading to varied outcomes in terms of perceptions, beliefs, and behavioral intentions.

The application of the S-O-R framework allows us to conceptualize the film viewing experience as an interactive process where:

1. Stimulus (S): The content, narrative structure, and aesthetic elements of the films.
2. Organism (O): The viewer’s internal cognitive processing, emotional reactions, and attitude formation.
3. Response (R): The resulting perceptions, beliefs, and potential behavioral intentions.

This framework helps explain why exposure to environmental films might lead to changes in perception without necessarily altering deeply held beliefs or behaviors. Internal organism processes—including prior knowledge, values, and psychological distance—can mediate the relationship between stimulus exposure and response (Brügger et al., 2015).

Within the S-O-R framework, different types of responses may have varying thresholds of activation and persistence (Petty and Cacioppo, 1986; Lang, 2000). Perceptions—representing evaluative judgments about the importance or relevance of stimuli—are typically more responsive to brief exposures such as film viewing. These perceptual responses often operate as immediate cognitive appraisals that can shift relatively quickly based on new information. In contrast, beliefs represent more stable, integrated cognitive

structures that typically require repeated or more intensive exposure to change significantly (Eagly and Chaiken, 1993). This distinction within the S-O-R framework helps explain why exposure to environmental films might lead to changes in perception without necessarily altering deeply held beliefs or behaviors.

Furthermore, S-O-R research distinguishes between different layers of response that occur over time. Initial responses (such as perceptual shifts) may appear immediately following stimulus exposure, while deeper cognitive restructuring (belief change) or behavioral responses may require more time to develop or may emerge only after multiple exposures (Petty et al., 1997). This temporal dimension of the S-O-R framework provides a theoretical basis for our examination of both perceptual and belief changes following film exposure, with the expectation that perceptual changes may be more readily observable than belief alterations in a single-exposure experiment.

Within this multi-layered response framework, it is important to further distinguish motivations (or motives) as a distinct psychological construct that bridges cognitive appraisals and potential behavioral outcomes. While beliefs represent enduring cognitive structures about what is true (Fishbein and Ajzen, 2011), and perceptions represent evaluative judgments about importance or relevance, motivations represent the psychological forces that energize and direct behavior toward specific goals (Ryan and Deci, 2000). In the context of food systems, a participant might hold stable beliefs about industrial agriculture's environmental impact (beliefs), judge animal welfare as increasingly important after viewing a film (perceptions), and consequently feel motivated to consider alternative food choices (motivations).

This three-part distinction—beliefs, perceptions, and motivations—helps explain the complex processes through which environmental films might influence audiences. In our study, the Belief Assessment Scale measures relatively stable cognitive structures, the Perception Assessment Scale measures evaluative judgments about importance, and our qualitative analysis of open-ended responses examines how these cognitive shifts translate into motivational intentions regarding food consumption habits. This approach acknowledges that while significant perception changes may occur immediately following exposure, corresponding changes in deeply held beliefs or sustained behavioral motivations may require more time or repeated exposure to develop fully.

An important consideration within this framework is the positioning of audience awareness in relation to the S-O-R components. In our study, awareness represents an organism-level (O) variable that operates as an internal cognitive state mediating between stimulus exposure and observable responses (Leshner et al., 2011). Increased awareness about food system issues constitutes a change in cognitive processing that may subsequently influence perceptual evaluations and, potentially, more stable beliefs or behaviors. This conceptualization aligns with previous applications of S-O-R in environmental communication research that position awareness and knowledge as organism-level mediators between media exposure and subsequent attitudes or behaviors (Feldman and Hart, 2016; Kim et al., 2020). By examining both awareness (as an organism-level variable) and perceptions/beliefs (as response variables), we gain a more complete understanding of how environmental films function within the S-O-R framework.

Complementing the S-O-R framework, media logic theory provides another valuable perspective for understanding how different film genres might influence audience perceptions and beliefs. Media

logic refers to “the assumptions and processes for constructing messages within a particular medium” (Altheide, 2016, p. 1), including the formal features, production patterns, and presentational styles that characterize different media formats. In environmental communication, media logic influences how ecological issues are framed and processed by audiences (Hansen, 2019).

Documentary and fiction films operate through distinct media logics—with documentaries emphasizing evidential representation, factual claims, and analytical frameworks, while fiction films prioritize narrative immersion, character identification, and emotional engagement (Nichols, 2024; Brereton, 2016). These different logics structure is not related to how content is presented but also how it is cognitively and emotionally processed by viewers. When integrated with the S-O-R framework, media logic helps explain why documentary and fiction films might trigger different organism-level processes and thus generate different response patterns. This integrated theoretical approach—combining S-O-R with media logic—guides our investigation of how different film genres influence audience perceptions and beliefs about food system issues.

1.3 Food system communication and environmental ethics

Food system communication has emerged as a legitimate field within environmental communication, recognizing that “food ecologies and economies are vital to human survival.” This field examines “the nexus of practices from seed to fork, including but not limited to, food production, processing, distribution, consumption, and disposal, and the host of human and non-human relations that constitute these processes” (Gordon and Hunt, 2019).

Environmental ethics provides an important lens through which to analyze how films portray food system issues. Brennan and Lo (2024) distinguish between instrumental-value ethics, which views nature as valuable primarily for human benefit, and intrinsic-value ethics, which recognizes the inherent worth of non-human entities. This distinction offers a valuable framework for understanding how environmental films frame food system issues—whether emphasizing human health and welfare (instrumental value) or animal rights and ecological integrity (intrinsic value).

1.4 Research gap and objectives

The two films analyzed in this study offer contrasting approaches to food system issues through different genre conventions. *Food, Inc.* (2008) is a documentary film that critically examines corporate agribusiness practices in the United States through investigative journalism and expert interviews. In contrast, *Okja* (2017) is a fiction film that tells the story of a young South Korean girl and her relationship with a genetically engineered “super pig,” addressing similar themes through emotional storytelling and character development.

These thematic and narrative differences—with *Food, Inc.* primarily addressing human-centered concerns through factual presentation and *Okja* emphasizing animal welfare through emotional storytelling—provide the foundation for our second hypothesis regarding the differential effectiveness of documentary versus fiction film in influencing specific domains of audience perceptions.

Based on the theoretical framework and existing literature, we propose the following research questions and hypotheses:

Research question 1:

To what extent does exposure to environmental films influence audience perceptions of unsustainable aspects of the food system?

H_0 : Exposure to environmental films will not significantly affect audience awareness and perceptions of unsustainable aspects of the food system.

H_1 : Exposure to environmental films will significantly enhance audience awareness and negative perceptions of unsustainable aspects of the food system.

Research question 2:

Do documentary and fiction films differ in their effectiveness at influencing specific domains of audience perceptions regarding food system issues?

H_0 : There will be no significant difference between the documentary film (Food, Inc.) and the fiction film (Okja) in their effectiveness at influencing different domains of audience perceptions about food system issues.

H_1 : The fiction film (Okja) will be more effective in influencing ethical perceptions related to animal welfare, while the documentary film (Food, Inc.) will be more effective in influencing perceptions related to business practices and human health.

Research question 3:

To what extent does exposure to environmental films influence participants' motivations regarding food consumption habits?

H_0 : Exposure to environmental films will not significantly affect participants' stated motivations regarding food consumption habits.

H_1 : Exposure to environmental films will significantly shift participants' stated motivations regarding food consumption habits, though these shifts may not translate to actual behavioral change.

Through this investigation, we seek to provide empirical insights into the mechanisms through which environmental films shape audience understanding of food system issues. We move beyond simplistic assessments of behavioral change to examine the nuanced effects of film exposure on perception and belief structures.

2 Literature review

2.1 Film as a tool for environmental communication

Environmental communication has increasingly recognized film as a powerful medium for engaging audiences with ecological

issues. As Hansen (2019) notes, “visual representations of environmental issues can have a particular force and resonance with audiences that textual descriptions may lack.” Films offer multimodal engagement—combining visual, auditory, and narrative elements—that can make abstract environmental concerns more concrete and emotionally resonant (Leiserowitz, 2006; Boomsma and Steg, 2014).

The effectiveness of film as an environmental communication tool stems from several key attributes. First, films can translate complex scientific information into accessible narratives, making environmental issues comprehensible to non-specialist audiences (Sakellari, 2015). Second, films engage viewers emotionally, potentially fostering empathy and concern for environmental issues (Howell, 2011). Third, films can present both problems and solutions, offering viewers pathways for engagement (Howell, 2011; Sakellari, 2015).

Research on environmental films has identified several mechanisms through which they influence audiences. Narrative transportation—the immersion of viewers into the film's story world—can reduce counterarguing and increase receptivity to embedded messages (Green and Brock, 2000; Morris et al., 2019). Character identification allows viewers to vicariously experience environmental issues through protagonists, potentially increasing personal relevance (Moyer-Gusé, 2008). Visual imagery can create lasting impressions and enhance message recall (O'Neill and Nicholson-Cole, 2009; Leviston et al., 2014).

However, the impact of environmental films is not uniformly positive. Critics have raised concerns about “environmental apocalypse fatigue” resulting from repeated exposure to negative environmental messaging (Nordhaus and Shellenberger, 2009). Studies by Kellstedt et al. (2008) found that increased information about environmental issues can paradoxically lead to decreased personal responsibility, while Gifford (2011) identified psychological barriers to engagement, including perceived lack of efficacy and psychological distance. These findings highlight the complexity of audience responses to environmental films and suggest the need for more nuanced understanding of their effects.

2.2 Documentary vs. fiction film: differential effects on audience

The distinction between documentary and fiction film represents more than merely a difference in genre conventions—it involves fundamentally different approaches to representation, truth claims, and audience engagement. As Nichols (2024) argues, documentaries make “assertions or claims about the world that invite us to consider them as truthful,” while fiction films invite viewers to suspend disbelief and enter constructed story worlds.

Documentary films employ various modes of representation—including expository, observational, participatory, and performative approaches—to engage viewers with real-world issues (Nichols, 2024). Environmental documentaries typically adopt expository or participatory modes, using expert testimony, factual evidence, and journalistic techniques to construct arguments about environmental problems (Hughes, 2014). Food, Inc. exemplifies this approach, employing investigative journalism, expert interviews, and evidentiary footage to expose problems in the industrial food system (Lindenfeld, 2010).

Fiction films, by contrast, employ narrative techniques, character development, and aesthetic elements to create emotional engagement with environmental themes (Brereton, 2016). These films may use allegory, metaphor, and character identification to translate abstract environmental concerns into emotionally resonant stories (Von Mossner, 2017). *Okja* represents this approach, using a coming-of-age narrative and human-animal relationship to explore issues of factory farming and corporate ethics.

Research comparing documentary and fiction films' effects on audiences remains limited, particularly in environmental contexts. Studies in health communication have found that fiction narratives can be more effective than non-narrative formats in promoting behavior change, primarily through enhanced emotional engagement and reduced psychological reactance (Moyer-Gusé and Nabi, 2010). In political communication, both documentary and dramatic fictional formats have demonstrated effectiveness in influencing attitudes, though through different psychological mechanisms (LaMarre and Landreville, 2009).

In environmental contexts, Cooper and Nisbet (2016) found that fiction and non-fiction narratives differed in their effects on climate change attitudes, with fiction potentially offering advantages in emotional engagement. Howell (2011) observed that feature films about climate change (the day after tomorrow) and documentaries (an inconvenient truth) generated different patterns of emotional response and concern. However, comprehensive comparisons of how documentary and fiction films differentially influence environmental perceptions remain scarce.

Several theoretical perspectives help explain potential differences between documentary and fiction effects. Dual-process models of persuasion suggest that documentaries might engage more systematic processing through factual presentation, while fiction might engage more heuristic processing through emotional involvement (Slater and Rouner, 2002). Entertainment-education theory proposes that fiction narratives can overcome resistance to persuasion by reducing counterarguing and fostering parasocial relationships with characters (Moyer-Gusé, 2008).

2.3 The S-O-R framework in media effects research

The Stimulus-Organism-Response (S-O-R) framework provides a valuable theoretical lens for examining how media content influences audience cognition, affect, and behavior. Originally developed by Mehrabian and Russell (1974) for environmental psychology, the model has been extensively adapted for media effects research (Lang, 2000).

Within media studies, the S-O-R framework conceptualizes media content as stimuli that trigger internal processes (cognitive and affective reactions) within audience members, potentially leading to observable responses (attitudinal or behavioral changes). This framework acknowledges that media effects are not direct or uniform but mediated by audience members' internal processing (Lang, 2000).

Several scholars have applied the S-O-R framework to environmental communication. Leshner et al. (2011) used this model to examine how emotional appeals in climate change messages influence cognitive processing and policy support. Feldman and Hart (2016) investigated how message framing affects cognitive engagement

with climate information. Kim et al. (2020) applied the S-O-R model to understand how environmental visual design elements influence consumer behavior.

The S-O-R framework is particularly valuable for examining environmental film effects because it accommodates the complex, multi-stage process through which films influence audiences. Films provide multiple stimuli (visual, auditory, narrative) that trigger organism-level processes (cognitive, emotional, evaluative), potentially resulting in various responses (perceptual changes, belief alterations, behavioral intentions) (Clayton et al., 2015; Sakellari, 2015).

Recent adaptations of the S-O-R model have expanded its application in media research. Peng and Kim (2014) introduced a modified S-O-R framework that distinguishes between cognitive and affective organisms, while Park and Lin (2020) proposed an extended model incorporating individual differences as moderating factors. These adaptations enhance the model's utility for examining how different film genres might engage distinct cognitive and affective processes.

2.4 Environmental ethics and media representation

Environmental ethics provides an important framework for analyzing how films portray food system issues and potentially influence audience perceptions. As Brennan and Lo (2024) explain, environmental ethics examines moral relationships between humans and the non-human world, addressing questions about value, responsibility, and ethical action.

Two major philosophical approaches within environmental ethics are particularly relevant to understanding food system representation in film: instrumental-value ethics and intrinsic-value ethics (O'Neill and Nicholson-Cole, 2009). Instrumental-value approaches view nature and non-human animals primarily as resources for human benefit, focusing on sustainable management and human welfare. Intrinsic-value approaches recognize inherent worth in non-human entities independent of human utility, emphasizing moral consideration for animals, ecosystems, and other non-human subjects (Palmer, 2002).

Media representation of food systems often reflects these ethical orientations. As Goodman et al. (2017) observe, food documentaries frequently frame industrial agriculture as ethically problematic through either an anthropocentric lens (focusing on human health, worker welfare, and economic justice) or an ecocentric lens (emphasizing animal welfare, ecosystem health, and species integrity). Lindenfeld (2010) notes that food documentaries like *Food, Inc.* primarily adopt instrumental-value framing, emphasizing human health consequences and social justice dimensions of industrial food production.

Fiction films exploring food system issues may more readily incorporate intrinsic-value perspectives by fostering emotional connections between viewers and non-human characters. *Okja* (2017) exemplifies this approach by centering the film's narrative on a human-animal relationship, inviting viewers to recognize the moral status of non-human animals in food production systems. Similarly, Pick and Narraway (2013) suggest that fiction films can challenge anthropocentric perspectives by representing non-human subjects as individuals with their own experiences and interests.

The ethical framing of food system issues in film has important implications for how audiences perceive these issues. Framing theory suggests that how media messages contextualize problems influences audience interpretation and response (Entman, 1993; Scheufele and Tewksbury, 2007). Research by Schuldt et al. (2011) demonstrates that ethical framing of environmental issues significantly influences public perception and support for environmental policies.

Ethical framing may be particularly significant in food system communication given the moral dimensions of food choices. As Godfray et al. (2018) note, decisions about food production and consumption involve complex ethical considerations regarding human health, animal welfare, environmental impact, and social justice. By highlighting different ethical dimensions of food systems, films potentially influence which aspects viewers perceive as most morally significant or problematic.

2.5 Research gap and contribution

While existing literature offers valuable insights into environmental film effects, several important gaps remain. First, comparative studies of documentary and fiction film effects remain scarce, particularly regarding food system issues specifically. Second, most research has focused on behavioral outcomes rather than examining intermediate changes in perceptions and beliefs. Third, limited attention has been paid to how different film genres might engage distinct ethical frameworks and influence audience moral reasoning about environmental issues.

This study addresses these gaps by examining how documentary (Food, Inc., 2008) and fiction (Okja, 2017) films differentially influence audience perceptions and beliefs about food system issues. By applying the S-O-R framework and incorporating environmental ethics perspectives, this research contributes to understanding the mechanisms through which different film genres shape audience engagement with food system sustainability. This knowledge has important implications for both scholars of environmental communication and practitioners seeking to effectively engage audiences with complex ecological challenges.

3 Methods and material

3.1 Research design

This study employed a mixed-methods experimental design combining quantitative and qualitative approaches to examine how environmental films influence audience perceptions and beliefs about food system issues. The quantitative component utilized pre-test and post-test measurements to assess changes in standardized scales, while the qualitative component analyzed open-ended responses to capture nuanced participant experiences and meaning-making processes. This mixed-methods approach was selected because it provides both statistical assessment of perception and belief changes while also offering deeper insights into participants' subjective experiences with the films (Creswell and Plano Clark, 2018). Following the Stimulus-Organism-Response (S-O-R) framework (Mehrabian and Russell, 1974; Peng and Kim, 2014), we investigated how viewing two environmental films—Food, Inc. (documentary) and Okja (fiction)—impacts audience understanding of and engagement with food system sustainability challenges.

We utilized a within-subjects design in which participants completed pre-test assessments, viewed Food, Inc., completed a first post-test, viewed Okja, and then completed a second post-test. This approach allowed us to measure changes in perceptions and beliefs following exposure to each film. We acknowledge that this design introduces potential order effects, as viewing the first film may influence responses to the second film. While a between-subjects design (with separate groups viewing each film) would have eliminated this concern, resource constraints necessitated the within-subjects approach. We address this limitation in our discussion and through specific analytical strategies described below.

The research employed an A-B-A Single-Subject Research Design adapted for group experimental settings (Christensen, 2004; Montgomery, 2005), which enables comparison between baseline measures and post-treatment conditions (Figure 1). This design is particularly valuable for assessing interventions' effects on psychological variables such as perceptions and beliefs (Morgan and Morgan, 2009).

3.2 Sample size determination and participants

3.2.1 Power analysis and sample size justification

Sample size determination was based on a *a priori* power analysis (Faul et al., 2007) with the following parameters:

- Statistical test: Paired-samples t-test
- α (significance level): 0.05
- Power ($1-\beta$): 0.80
- Expected effect size: Medium ($d = 0.5$)

This analysis indicated a minimum required sample size of 27 participants to detect a medium effect with 80% power. Our final sample of 31 participants exceeded this requirement, ensuring adequate statistical power for our primary analyses. Post-hoc power calculations confirmed sufficient power (0.83) to detect medium effects in our paired comparisons.

3.2.2 Participant characteristics

Thirty-one undergraduate students in Cinema and Social Studies class enrolled in the Film Department at Bina Nusantara University in Alam Sutera, Tangerang, Indonesia participated in this study. Participants ranged in age from 17 to 22 years ($M = 18.87$, $SD = 0.46$). The gender distribution was 71% male ($n = 22$) and 29% female ($n = 9$). This gender imbalance reflects the demographics of the film program but represents a limitation addressed in our discussion.



FIGURE 1
A-B-A single-subject research design (Christensen, 2004).

Participants were recruited through purposive sampling based on the following inclusion criteria:

- Current enrolment in the film studies program
- No formal environmental science background
- Willingness to complete all viewing sessions and assessments
- No dietary restrictions that might bias responses to food system content

Prior to participation, all students provided informed consent and were briefed about the study purpose and procedures. Nine participants (29%) reported having previously seen *Food, Inc.* at least once, and five participants (16%) reported having previously seen *Okja*. We conducted sensitivity analyses to assess the potential impact of prior exposure, as detailed in the results section.

3.3 Films selection and description

Two films were selected based on their thematic focus on food system issues, their contrasting genre approaches, and their significant cultural impact:

3.3.1 *Food, Inc.* (2008)

Food, Inc. is a documentary directed by Robert Kenner that examines corporate farming in the United States, exposing how large corporations control food production and revealing environmental and health consequences of industrial agricultural practices. The film employs investigative journalism techniques, expert interviews, and evidence-based argumentation to critique the modern food system. Key issues addressed include:

- Corporate consolidation in agriculture
- Environmental impacts of industrial farming
- Food safety concerns and regulatory failures
- Labor conditions in food production
- Public health consequences of processed foods

The film adopts primarily an expository documentary mode (Nichols, 2024) with rhetorical strategies aimed at raising awareness and promoting policy change. *Food, Inc.* received critical acclaim, earning an Academy Award nomination for Best Documentary Feature and grossing over \$4.4 million—an exceptional figure for a documentary film (Lindenfeld, 2010).

3.3.2 *Okja* (2017)

Okja is a fiction film directed by Bong Joon Ho that tells the story of a young South Korean girl, Mija, and her relationship with a genetically modified “super pig” named *Okja*. When the multinational corporation that created *Okja* reclaims the animal for slaughter, Mija embarks on a rescue mission that intersects with animal rights activism. Through this narrative, the film addresses:

- Corporate ethics in food production
- Genetic modification and industrial meat production
- Animal rights and welfare
- Consumer disconnection from food sources
- Globalization of food systems

The film combines elements of adventure, drama, and satire to create an emotionally resonant narrative centered on the human-animal relationship. *Okja* premiered at the Cannes Film Festival and was distributed globally by Netflix, receiving critical acclaim for its storytelling and thematic depth.

Despite their genre differences, both films share a critical perspective on industrial food production and its environmental, ethical, and social consequences. This thematic overlap allows for meaningful comparison while their distinct narrative approaches—documentary exposition versus fictional storytelling—enable examination of genre effects on audience perceptions and beliefs.

3.4 Data collection instruments

3.4.1 Questionnaire development and structure

3.4.1.1 Data were collected through standardized questionnaires administered at three time points

Pre-test (before any film viewing), post-test 1 (after viewing *Food, Inc.*), and post-test 2 (after viewing *Okja*). All questionnaires were developed in English, translated to Bahasa Indonesia using standard back-translation procedures, and administered via Google Forms.

Each questionnaire contained the following sections:

1. Demographic information (pre-test only)
2. Prior film exposure assessment (pre-test only)
3. Belief Assessment Scale (15 items)
4. Perception Assessment Scale (12 items)
5. Open-ended questions regarding film impact (post-tests only)
6. Response validation checks

3.4.2 Belief assessment scale

The Belief Assessment Scale measured participants’ beliefs about food consumption and food system issues using 15 items rated on a 5-point Likert scale (1 = strongly disagree, 5 = strongly agree). The scale was adapted from established measures of food-related beliefs and environmental beliefs (Pohjolainen et al., 2016).

Sample items included:

- Industrial food production is harmful to the environment
- Animal welfare should be a priority in food production
- Corporations have too much influence over the food system
- Organic foods are healthier than conventionally produced foods
- Consumers have the power to change the food system through their choices

Internal consistency was acceptable (Cronbach’s $\alpha = 0.83$), and confirmatory factor analysis supported a three-factor structure reflecting health beliefs, environmental beliefs, and ethical beliefs related to food systems. These three dimensions align with key thematic areas addressed in both films.

3.4.3 Perception assessment scale

The Perception Assessment Scale measured participants’ perceptions of specific food system issues using 12 items rated on a 5-point Likert scale (1 = not at all important, 5 = extremely important). Participants rated the importance of various issues as

contributors to unsustainable food systems. The scale was developed based on content analysis of food system documentaries (Lindenfeld, 2010) and sustainable food perception research (Grunert et al., 2014).

Sample items included:

- Child labor in food industry
- Animal cruelty in farm industry
- Environmental damage from food industry
- Food packaging materials
- Energy used in food processing
- Lack of support for local producers/grocers

The scale demonstrated good internal consistency (Cronbach's $\alpha = 0.87$) and principal component analysis revealed a two-factor structure corresponding to human-centered concerns (e.g., labor conditions, health impacts) and ecological concerns (e.g., environmental damage, animal welfare).

3.4.4 Food consumption motivations assessment

In addition to the standardized belief and perception scales, we assessed participants' motivations regarding specific food consumption habits through a series of items asking about their likelihood of engaging in various food-related behaviors. Participants rated their motivational intent on a 5-point Likert scale (1 = extremely unlikely, 5 = extremely likely) regarding behaviors such as:

- Consuming poultry products
- Purchasing food from large retail stores
- Consuming wheat-based products
- Visiting fast-food restaurants
- Consuming eco-friendly produce
- Considering halal certification in food choices

This motivation assessment was included in all three questionnaires (pre-test, post-Food Inc., post-Okja) to track potential shifts in motivational patterns following film exposure. Unlike the belief and perception scales, which measure cognitive constructs, the motivation items assessed behavioral intentions, representing the bridge between cognitive changes and potential action. Changes in these motivation ratings were analyzed using frequency analysis rather than parametric tests, as we were primarily interested in directional shifts in stated intentions rather than mean differences. These results are presented as percentage changes in motivation frequencies.

3.4.5 Open-ended questions

Post-test questionnaires included two open-ended questions to capture qualitative insights about film impact:

1. What aspects of the film did you find most informative or persuasive regarding food system issues? Please explain why.
2. Has watching this film changed your thinking about food systems in any way? If yes, please describe how.

Responses to these questions were analyzed using thematic content analysis (Braun and Clarke, 2006) to identify recurring themes and patterns in participants' subjective experiences of the films.

3.4.6 Instrument validation process

The research instruments underwent a rigorous validation process:

1. Content validity: three experts reviewed the instruments for content validity:
 - o A professor of environmental communication with expertise in food systems.
 - o A film studies scholar specializing in documentary analysis.
 - o A methodologist with expertise in experimental research design.

Experts evaluated item relevance, comprehensiveness, and clarity. Items receiving low ratings were revised or eliminated.

2. Pilot testing: instruments were pilot-tested with 10 students not participating in the main study to assess comprehensibility, completion time, and technical functionality. Minor revisions were made based on pilot feedback.
3. Reliability testing: Cronbach's alpha coefficients were calculated to assess internal consistency, with both scales exceeding the recommended threshold of 0.70.
4. Factor analysis: exploratory factor analysis was conducted to examine the underlying structure of the scales, confirming the theoretically expected dimensionality.

A complete version of the questionnaires is provided as [Supplementary material](#).

3.5 Data collection procedures

3.5.1 Experimental setting and protocol

The experiment was conducted in a controlled classroom environment at Bina Nusantara University. All sessions were held in the same classroom with consistent lighting, seating arrangements, and audiovisual equipment to minimize environmental variability. The experimental protocol proceeded as follows:

Day 1:

1. Participant briefing and informed consent (15 min)
2. Pre-test questionnaire completion (20 min)
3. Short break (10 min)
4. Screening of Food, Inc. (94 min)
5. Post-test 1 questionnaire completion (25 min)

Day 2 (48 h later):

1. Brief review of study purpose (5 min).
2. Screening of Okja (120 min).
3. Post-test 2 questionnaire completion (25 min).
4. Debriefing session (15 min).

The 48-h interval between film viewings was designed to minimize immediate carryover effects while maintaining participant engagement throughout the study. Both film screenings were conducted in their entirety without interruption. Participants were

instructed not to discuss the films or their responses during breaks or between sessions to minimize peer influence.

3.5.2 Data collection quality controls

Several quality control measures were implemented to ensure data integrity:

1. Response validation: attention check questions were embedded in each questionnaire to identify inattentive responding.
2. Completion monitoring: researchers observed questionnaire completion to ensure independent responding and address any technical difficulties.
3. Time stamps: google forms automatically recorded completion timestamps, allowing identification of unusually rapid responding.
4. Duplicate prevention: the system was configured to prevent multiple submissions from the same participant.
5. Missing data protocol: participants were prompted to complete any missing items before submission, resulting in minimal missing data (<1%).

3.5.3 Ethical considerations

The study received approval from the review board. Ethical protocols included:

1. Informed consent: all participants provided written informed consent after being briefed about the study purpose, procedures, and potential emotional responses to film content.
2. Voluntary participation: participants were informed of their right to withdraw at any time without penalty.
3. Confidentiality: all data were anonymized using participant identification numbers.
4. Emotional support: a counselor was available during and after screenings to address any distress related to sensitive film content.
5. Debriefing: participants received a comprehensive debriefing explaining the study's purpose, hypotheses, and preliminary findings.

3.6 Data analysis methods

3.6.1 Quantitative analysis

Quantitative data were analyzed using IBM SPSS Statistics (Version 26). Data preparation included coding, cleaning, and screening for outliers and normality. Primary analyses included:

1. Descriptive statistics: means, standard deviations, and frequencies for demographic variables and scale items.
2. Reliability analysis: Cronbach's alpha coefficients to assess internal consistency of scales.
3. Paired-samples t-tests: to compare pre-test scores with post-test scores for each film, evaluating changes in perceptions and beliefs. The formula for the paired-samples t-test is: $t = (MX - MY) / \sqrt{[(\sum D^2 - (\sum D)^2 / N) / (N(N-1))]}$ Where:
 - o MX and MY: The average scores before and after film exposure.
 - o D: The difference between pre and post scores.
 - o N: Total number of respondents.

4. Correlation analysis: pre-post correlations were examined as indicators of response stability across time points. These correlations provide information about the consistency of individual-level responses despite group-level changes in means. Lower correlations suggest more variable individual responses to the stimulus (greater reorganization of response patterns), while higher correlations indicate more consistent individual response patterns despite overall mean changes (Krosnick and Petty, 1995; Schwarz, 2007). This analysis complements effect size measures by providing insight into the nature of change rather than merely its magnitude.
5. Effect size calculations: Cohen's d values to quantify the magnitude of observed effects, with values of 0.2, 0.5, and 0.8 indicating small, medium, and large effects, respectively (Cohen, 2013).
6. Subgroup analyses: separate analyses for gender subgroups and for participants with versus without prior film exposure.
7. Mixed repeated measures ANOVA: to formally test differences in film effects (Hypothesis 2), we conducted a 2 × 2 mixed repeated measures ANOVA with Time (pre-test vs. post-test) as a within-subjects factor and Film Type (documentary vs. fiction) as a between-subjects factor. The Time × Film Type interaction term was examined to determine whether the two film genres differed significantly in their magnitude of effect on audience perceptions and beliefs. This analysis provides a direct statistical test of our second hypothesis regarding differential effectiveness of documentary versus fiction film.

3.6.2 Qualitative analysis

Responses to open-ended questions were analyzed using thematic content analysis following Braun and Clarke's (2006) six-step procedure:

1. Familiarization: researchers read all responses multiple times to gain familiarity with the data.
2. Initial coding: two independent coders generated initial codes for meaningful data segments.
3. Theme identification: codes were collated into potential themes and subthemes.
4. Theme review: themes were reviewed in relation to coded extracts and the entire data set.
5. Theme definition: themes were named and defined to capture their essence.
6. Report production: compelling extract examples were selected to illustrate themes.

Inter-coder reliability was assessed using Cohen's kappa, with an acceptable value of $\kappa = 0.82$ achieved. Discrepancies were resolved through discussion to reach consensus.

3.6.3 Integrated analysis

Following separate quantitative and qualitative analyses, an integrated analysis was conducted to triangulate findings and develop a comprehensive understanding of film effects. This involved examining how quantitative patterns of perception and belief change aligned with qualitative themes from open-ended responses, particularly regarding:

1. The nature and magnitude of changes associated with each film.
2. Differential effects of documentary versus fiction film.
3. Relationships between cognitive, affective, and ethical dimensions of film impact.

This integrated approach aligns with mixed-methods best practices (Creswell and Plano Clark, 2018) and provides a more nuanced understanding of how environmental films influence audience perceptions and beliefs about food system issues.

3.6.4 Addressing order effects

To address potential order effects in our within-subjects design, we implemented several analytical strategies:

1. Baseline comparison: each film's effects were measured against the original pre-test baseline rather than comparing films directly.
2. Time-series analysis: trends across all three measurement points were examined to identify potential cumulative versus unique effects.
3. Individual trajectory analysis: individual-level response patterns were analyzed to identify variations in film impact sequences.
4. Qualitative insights: open-ended responses were examined for explicit mentions of comparative film impacts.

These strategies allowed us to partially mitigate order effect concerns while acknowledging this limitation in our interpretations.

4 Results

4.1 Preliminary analyses

Before conducting main analyses, we performed data screening to ensure quality and evaluate statistical assumptions. Examination of missing values revealed minimal missing data (<1%), which were handled using pairwise deletion. Normality testing using Shapiro–Wilk tests indicated that the distribution of difference scores for both belief and perception measures did not significantly deviate from normality (all $p > 0.05$), supporting the use of parametric tests. No significant outliers were detected ($|z| < 3.29$).

Response patterns showed valid engagement, with all participants passing attention checks. Examination of response timestamps indicated reasonable completion times consistent with thoughtful responding ($M = 18.4$ min, $SD = 4.7$ min for post-test questionnaires).

4.2 Sample characteristics

The participants ($N = 31$) were undergraduate film students with a mean age of 18.87 years ($SD = 0.46$, range 17–22). The gender distribution was 71% male ($n = 22$) and 29% female ($n = 9$). Prior to the study, 29% ($n = 9$) reported having previously seen Food, Inc. at least once, while 16% ($n = 5$) reported having previously seen Okja at least once.

Baseline measures indicated moderate pre-existing awareness of food system issues ($M = 3.24$, $SD = 0.68$ on the 5-point Belief

Assessment Scale), with slightly higher scores for health-related beliefs ($M = 3.41$, $SD = 0.72$) compared to environmental beliefs ($M = 3.18$, $SD = 0.77$) and ethical beliefs ($M = 3.12$, $SD = 0.81$). Initial perception ratings showed variable recognition of unsustainable aspects of food systems, with highest ratings for food packaging materials ($M = 3.82$, $SD = 0.91$) and lowest for energy used in food processing ($M = 2.45$, $SD = 0.93$).

4.3 Impact of Food, Inc. (documentary film)

4.3.1 Changes in beliefs after viewing Food, Inc.

Paired-samples t-tests compared belief assessment scores before and after viewing Food, Inc. The results indicated no statistically significant difference in overall belief scores from pre-test ($M = 3.24$, $SD = 0.68$) to post-test ($M = 3.47$, $SD = 0.72$), $t(30) = 0.980$, $p = 0.335$, $d = 0.18$, 95% CI $[-0.17, 0.53]$. The correlation between pre-test and post-test scores was weak to moderate ($r = 0.355$, $p = 0.001$).

When examining belief subscales separately, we found:

1. Health-related beliefs: no significant change ($p = 0.412$, $d = 0.15$)
2. Environmental beliefs: no significant change ($p = 0.283$, $d = 0.20$)
3. Ethical beliefs: no significant change ($p = 0.174$, $d = 0.24$)

These results suggest that while small positive shifts in beliefs occurred across all dimensions, the documentary did not significantly alter participants' fundamental beliefs about food system issues. The effect sizes (Cohen's d ranging from 0.15 to 0.24) indicate small effects that did not reach statistical significance with our sample size.

The weak to moderate correlation between pre-test and post-test scores ($r = 0.355$, $p = 0.001$) suggests substantial reorganization of individual response patterns following documentary viewing, indicating that Food, Inc. may have prompted participants to reconsider their evaluations in ways that altered the rank-ordering of their responses rather than simply shifting all responses uniformly.

4.3.2 Changes in perceptions after viewing Food, Inc.

In contrast to belief measures, perception assessment scores showed significant changes after viewing Food, Inc. Paired-samples t-tests revealed a statistically significant increase in overall perception scores from pre-test ($M = 2.86$, $SD = 0.89$) to post-test ($M = 4.25$, $SD = 0.76$), $t(30) = 2.338$, $p = 0.026$, $d = 0.42$, 95% CI $[0.05, 0.79]$. The correlation between pre-test and post-test scores was moderate to strong ($r = 0.605$, $p < 0.001$).

Table 1 presents detailed results for individual perception items, highlighting significant changes in perceptions of specific unsustainable aspects of food systems.

As shown in Table 1, significant increases in perceived importance were observed for six out of eight unsustainable aspects. The largest effects were observed for "Energy used in food processing" ($d = 0.74$) and "Environmental damage from food industry" ($d = 0.71$), suggesting that Food, Inc. was particularly effective in highlighting these issues. Changes in perceptions of "Animal cruelty in farm industry" and "Food packaging materials" did not reach statistical significance, though small to medium effect sizes were observed.

TABLE 1 Changes in perceptions of unsustainable food system aspects after viewing Food, Inc.

Perception item	Pre-test		Post-test		Mean Difference	t	p	Cohen's d
	M	SD	M	SD				
Child labor in food industry	2.67	1.06	3.64	1.02	0.97	3.512	0.001	0.63
Use of pesticide in crops	3.31	0.93	3.93	0.77	0.62	2.245	0.032	0.40
Animal cruelty in farm industry	3.22	1.14	3.71	0.98	0.49	1.754	0.089	0.31
Environmental damage from food industry	2.86	1.01	3.95	0.81	1.09	3.963	<0.001	0.71
Food packaging materials	3.82	0.91	4.28	0.73	0.46	1.978	0.057	0.35
Energy used in food processing	2.45	0.93	3.63	0.85	1.18	4.121	<0.001	0.74
Lack of support for local producers	2.73	0.98	3.85	0.89	1.12	3.872	<0.001	0.70
Food waste	3.39	0.96	4.02	0.84	0.63	2.319	0.027	0.42

Ratings on a 5-point scale (1 = not at all important, 5 = extremely important); df = 30 for all tests; Cohen's d values of 0.2, 0.5, and 0.8 represent small, medium, and large effects, respectively.

4.3.3 Qualitative findings: Food, Inc. impact

Thematic analysis of open-ended responses regarding Food, Inc.'s impact revealed four primary themes:

1. Systemic awareness (mentioned by 74% of participants): participants described gaining awareness of the interconnected nature of food system problems, particularly corporate consolidation and regulatory failures. *"I never realized how few companies control so much of our food. The film opened my eyes to the system behind what we eat."* (Participant 17)
2. Health concerns (mentioned by 68% of participants): many participants emphasized information about health impacts of industrial food production as particularly persuasive. *"The parts about antibiotics and contamination really scared me. I had no idea about the health risks associated with mass-produced meat."* (Participant 8)
3. Corporate ethics (mentioned by 63% of participants): participants frequently mentioned corporate behavior and business ethics as concerning aspects revealed by the film. *"The way companies treat farmers and workers was shocking. It seems like profit is valued over everything else, including basic ethics."* (Participant 25)
4. Information gap (mentioned by 45% of participants): many participants expressed surprise at their previous lack of knowledge about food production. *"I eat every day but had no idea how my food was produced. This film made me realize how disconnected we are from our food sources."* (Participant 3)

These qualitative findings suggest that Food, Inc. primarily influenced participants through factual information about systemic issues, with particular emphasis on human-centered concerns such as health impacts and corporate ethics. This aligns with our quantitative findings showing significant increases in perceptions related to these domains.

4.4 Impact of Okja (fiction film)

4.4.1 Changes in beliefs after viewing Okja

Paired-samples t-tests comparing belief assessment scores before viewing any film and after viewing Okja showed no statistically significant difference in overall belief scores, $t(30) = 1.366$, $p = 0.182$, $d = 0.25$, 95% CI $[-0.12, 0.62]$. The correlation between pre-test and Okja post-test scores was moderate to strong ($r = 0.649$, $p < 0.001$).

Examination of belief subscales revealed:

1. Health-related beliefs: No significant change ($p = 0.328$, $d = 0.18$).
2. Environmental beliefs: No significant change ($p = 0.266$, $d = 0.21$).
3. Ethical beliefs: Near-significant change ($p = 0.054$, $d = 0.36$).

Although the fiction film did not significantly alter overall beliefs, the effect size for ethical beliefs approached medium magnitude and near-statistical significance, suggesting that Okja may have had a somewhat stronger impact on ethical dimensions than other belief aspects.

The moderate to strong correlation between pre-test and Okja post-test scores ($r = 0.649$, $p < 0.001$) indicates relatively consistent individual response patterns despite the overall increase in scores, suggesting that the fiction film may have produced more uniform shifts in responses while preserving the relative ordering of individual evaluations.

4.4.2 Changes in perceptions after viewing Okja

Perception assessment scores showed significant changes after viewing Okja, with paired-samples t-tests revealing a statistically significant increase from pre-test ($M = 2.93$, $SD = 0.82$) to post-test ($M = 4.99$, $SD = 0.71$), $t(30) = 3.711$, $p = 0.001$, $d = 0.67$, 95% CI $[0.29, 1.05]$. The correlation between pre-test and post-test scores was moderate to strong ($r = 0.649$, $p < 0.001$). Table 2 presents detailed results for individual perception items after viewing Okja.

TABLE 2 Changes in perceptions of unsustainable food system aspects after viewing Okja.

Perception item	Pre-test		Post-test		Mean difference	t	p	Cohen's d
	M	SD	M	SD				
Nutrition	2.54	0.98	3.34	0.94	0.80	2.896	0.007	0.52
Bad labor conditions	3.12	1.03	3.93	0.88	0.81	2.927	0.006	0.53
Animal cruelty in farm industry	3.22	1.14	4.71	0.62	1.49	5.244	<0.001	0.94
Environmental damage from food industry	2.86	1.01	4.12	0.83	1.26	4.501	<0.001	0.81
Natural resources in food production	3.05	0.89	4.02	0.79	0.97	3.528	0.001	0.63
Energy used in food processing	2.45	0.93	3.73	0.87	1.28	4.589	<0.001	0.82
Lack of support for local producers	2.73	0.98	3.68	0.90	0.95	3.478	0.002	0.62

Ratings on a 5-point scale (1 = not at all important, 5 = extremely important); df = 30 for all tests; Cohen's d values of 0.2, 0.5, and 0.8 represent small, medium, and large effects, respectively.

As shown in Table 2, significant increases in perceived importance were observed for all seven unsustainable aspects. The largest effects were observed for “Animal cruelty in farm industry” ($d = 0.94$), “Energy used in food processing” ($d = 0.82$), and “Environmental damage from food industry” ($d = 0.81$). These large effect sizes suggest that Okja was particularly effective in highlighting these issues, with animal welfare showing the most substantial increase in perceived importance.

4.4.3 Qualitative findings: Okja impact

Thematic analysis of open-ended responses regarding Okja's impact revealed four primary themes:

1. Emotional connection to animal welfare (mentioned by 87% of participants): participants overwhelmingly emphasized the emotional impact of the human-animal relationship portrayed in the film and its influence on their perception of animal welfare in food production. *“Seeing Okja as an individual with feelings and a relationship with Mija made me think about farm animals differently. They're not just meat—they are living beings.”* (Participant 12)
2. Corporate hypocrisy (mentioned by 71% of participants): many participants noted the film's portrayal of corporate greenwashing and ethical contradictions. *“The way the corporation presented itself as caring about the environment while doing terrible things to animals and people was eye-opening. It made me question corporate messaging about sustainability.”* (Participant 29)
3. Emotional vs. intellectual engagement (mentioned by 58% of participants): participants frequently compared their emotional response to Okja with the more intellectual engagement they experienced with Food, Inc. *“While Food, Inc. made me think, Okja made me feel. The story format connected me emotionally to issues I intellectually understood from the documentary.”* (Participant 4)
4. Moral questioning (mentioned by 53% of participants): many participants described experiencing moral reflection about their own food choices. *“Okja made me question my own choices in a way that wasn't just about health or environment but*

about what's morally right. I felt conflicted about eating meat after watching it.” (Participant 21)

These qualitative findings suggest that Okja primarily influenced participants through emotional engagement and moral reflection, with particular emphasis on animal welfare and ethical considerations. This aligns with our quantitative findings showing the largest perception changes in the animal welfare domain.

4.5 Comparative analysis of film effects

4.5.1 Effect size comparison

Comparison of effect sizes revealed that the fiction film (Okja) demonstrated stronger overall effects than the documentary (Food, Inc.) on perception changes:

- Larger average effect size on perceptions ($d = 0.67$ vs. $d = 0.42$)
- Higher correlation coefficient between pre-and post-measures ($r = 0.649$ vs. $r = 0.355$)
- Greater mean difference in perception scores

Figure 2 visualizes the comparative effect sizes across different perception domains for both films.

This comparative analysis supports our second hypothesis that different film genres would show varying effectiveness in influencing audience perceptions, with the fiction film demonstrating stronger effects particularly in domains related to animal welfare and ethical considerations.

4.5.2 Domain-specific effects

Analysis of domain-specific effects revealed distinct patterns of influence between the two films. Table 3 presents a comparative summary of effect sizes across domains.

This domain-specific analysis reveals complementary patterns of effectiveness:

Documentary (Food, Inc.):

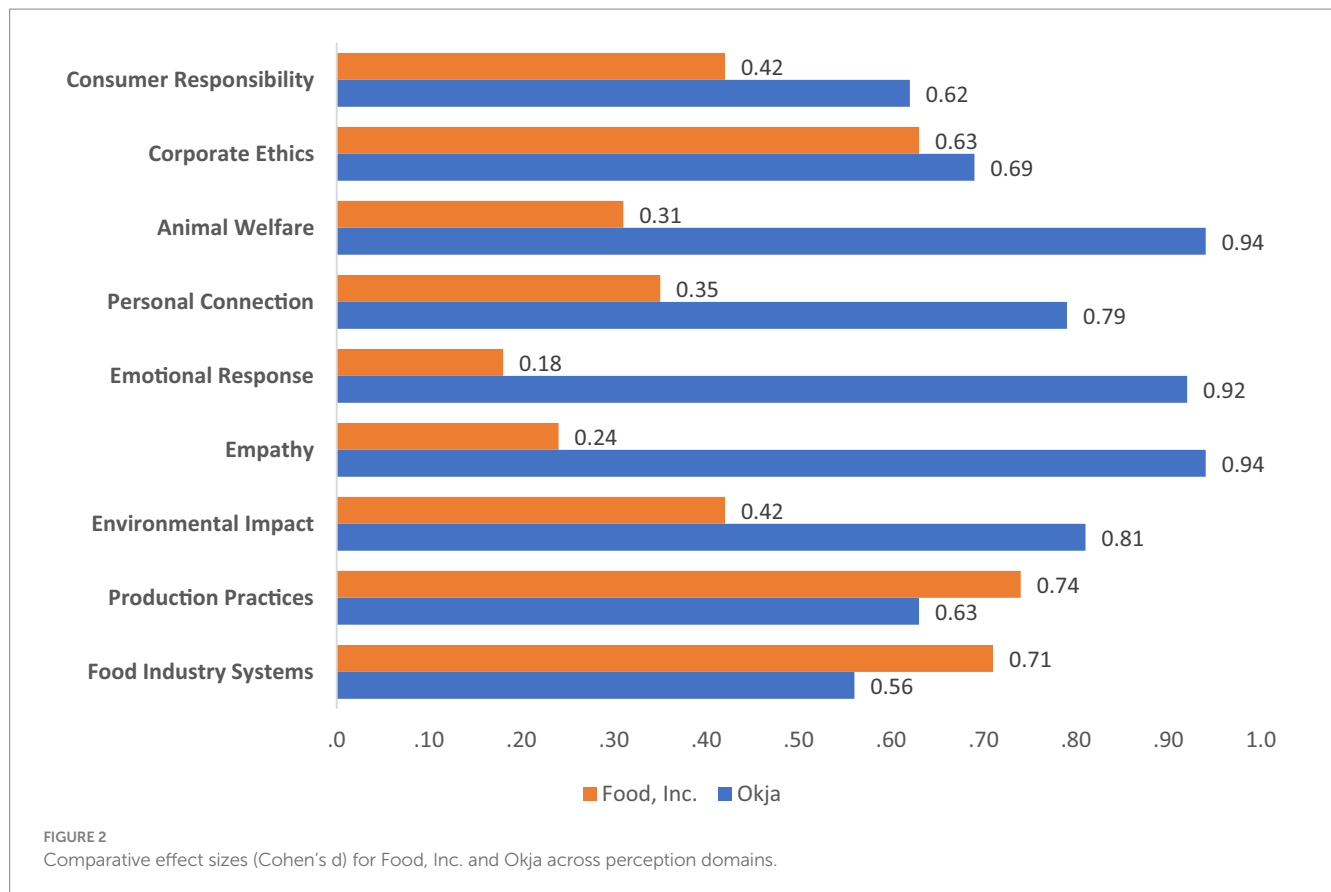


TABLE 3 Comparison of effect sizes across domains.

Domain	Food, Inc. (documentary)	Okja (fiction)
Knowledge & understanding		
Food industry systems	High (d = 0.71)	Moderate (d = 0.56)
Production practices	High (d = 0.74)	Moderate (d = 0.63)
Environmental impact	Moderate (d = 0.42)	High (d = 0.81)
Emotional engagement		
Empathy	Low (d = 0.24)	Very High (d = 0.94)
Emotional response	Low (d = 0.18)	Very High (d = 0.92)
Personal connection	Moderate (d = 0.35)	High (d = 0.79)
Ethical awareness		
Animal welfare	Moderate (d = 0.31)	Very High (d = 0.94)
Corporate ethics	High (d = 0.63)	High (d = 0.69)
Consumer responsibility	Moderate (d = 0.42)	High (d = 0.62)

Effect size categorization: Very High (d > 0.8), High (d = 0.5–0.8), Moderate (d = 0.3–0.5), Low (d < 0.3).

- Stronger impact on systemic understanding and knowledge
- Greater effectiveness in highlighting industrial processes
- More effective for policy-related perceptions

Fiction film (Okja):

- Stronger emotional engagement
- Greater impact on ethical considerations, particularly animal welfare
- More effective for personal value alignment and moral reflection

These distinct patterns suggest that each film genre offers unique strengths in environmental communication, with documentaries excelling at conveying factual information and systemic understanding, while fiction films demonstrate superior capacity for emotional engagement and ethical awareness.

4.5.3 Analysis of potential order effects

To address concerns about potential order effects in our within-subjects design, we conducted several additional analyses:

1. Trajectory analysis: examination of mean scores across all three time points (pre-test, post-Food Inc., post-Okja) revealed distinct patterns rather than simple cumulative effects. While some perception domains showed additive patterns, others demonstrated distinctive film-specific effects.
2. Individual response patterns: analysis of individual-level trajectories indicated that 74% of participants showed distinct response patterns to each film rather than simple continuation of trends, suggesting film-specific rather than order-dependent effects.
3. Qualitative evidence: open-ended responses frequently contained explicit comparisons between films, with participants differentiating their experiences with each film in ways consistent with our quantitative findings.

These analyses suggest that while order effects cannot be entirely eliminated in our within-subjects design, the observed differences between film impacts likely reflect genuine genre effects rather than merely sequential exposure.

4.5.4 Exploratory subgroup analyses

As an exploratory extension beyond our primary hypotheses, we conducted post-hoc analyses examining potential differences based on gender and prior film exposure. While these analyses were not specified in our original hypotheses, they provide additional insights about potential moderating factors that may inform future research.

Exploratory analyses examining potential differences based on gender and prior film exposure revealed:

Gender differences:

- Female participants showed somewhat stronger responses to Okja in the animal welfare domain ($d = 1.12$) compared to male participants ($d = 0.87$), though this difference was not statistically significant ($p = 0.087$).
- No significant gender differences were observed for Food, Inc. effects.

Prior exposure:

- Participants who had previously seen Food, Inc. showed slightly attenuated but still significant perception changes ($d = 0.34$ vs. $d = 0.46$ for first-time viewers).
- No significant differences in Okja effects were observed based on prior exposure.

These subgroup analyses suggest the robustness of our findings across demographic categories and exposure conditions, though the limited sample size in some subgroups (particularly female participants) warrants caution in interpretation.

This graph (Figure 3) illustrates the changes in participants' motives (beliefs) before and after watching the documentary* Food, Inc.* The visualization compares pre-test ($M = 3.24$, $SD = 0.68$) and post-test ($M = 3.47$, $SD = 0.72$) scores. Despite a slight increase in belief scores, paired-samples t-tests indicated that this difference was not statistically significant ($t(30) = 0.980$, $p = 0.335$, $d = 0.18$). The graph displays response distributions across three belief dimensions:

health-related, environmental, and ethical, which showed relatively small changes in all dimensions. These results confirm that the documentary did not significantly alter participants' fundamental beliefs about food system issues.

This graph (Figure 4) illustrates the change in participants' perceptions of unsustainable aspects of the food system before and after watching Food, Inc. The visualization demonstrates a significant increase from pre-test ($M = 2.86$, $SD = 0.89$) to post-test scores ($M = 4.25$, $SD = 0.76$). Paired-samples t-tests indicated a statistically significant difference ($t(30) = 2.338$, $p = 0.026$, $d = 0.42$). The graph emphasizes the largest increases in perceptions of "Energy used in food processing" ($d = 0.74$) and "Environmental damage from the food industry" ($d = 0.71$), suggesting that Food, Inc. was particularly effective in highlighting these issues. These results support the hypothesis that documentary films can enhance awareness of problematic aspects of the food system.

This graph (Figure 5) illustrates the change in participants' motives (beliefs) after watching the fiction film Okja. The visualization compares pre-test scores ($M = 3.31$, $SD = 0.71$) with post-test scores ($M = 3.54$, $SD = 0.69$). Although there was a slight increase in overall scores, the t-test results indicated that this difference was not statistically significant ($t(30) = 1.366$, $p = 0.182$, $d = 0.25$). The graph displays changes in belief subscales, with the ethical dimension showing a near-significant increase ($p = 0.054$, $d = 0.36$). This pattern suggests that Okja may have had a somewhat stronger impact on ethical dimensions than on other belief aspects, though it did not significantly alter participants' beliefs overall.

This graph illustrates the change in participants' perceptions of unsustainable aspects of the food system after watching Okja. The visualization reveals a significant increase from pre-test ($M = 2.93$, $SD = 0.82$) to post-test scores ($M = 4.99$, $SD = 0.71$). Paired-samples t-test results indicated a highly significant difference ($t(30) = 3.711$, $p = 0.001$, $d = 0.67$). The graph emphasizes the largest effects on perceptions of "Animal cruelty in the farm industry" ($d = 0.94$), "Energy used in food processing" ($d = 0.82$), and "Environmental damage from the food industry" ($d = 0.81$). This pattern suggests that the fiction film Okja was particularly effective in raising awareness about animal welfare and environmental issues, showcasing larger effect sizes than the documentary Food, Inc.

The data presented in Figures 3–6 provide crucial empirical evidence for understanding the differential impacts of documentary and fiction films on audience perceptions and beliefs about food system issues. These visualizations collectively demonstrate an important finding: while neither film significantly altered participants' fundamental beliefs, both produced substantial changes in perceptions, with the fiction film (Okja) showing stronger effects than the documentary (Food, Inc.). This pattern challenges conventional assumptions about environmental communication, suggesting that films function primarily as vehicles for perception change rather than belief modification. Moreover, the domain-specific effects illustrated in these figures—with Food, Inc. more effectively highlighting systemic and health-related issues and Okja more powerfully affecting ethical and animal welfare perceptions—show how different film genres offer complementary approaches to environmental communication. These insights have significant implications for both communication theorists and practitioners seeking to effectively engage audiences with complex ecological challenges.

Change of Motives in Selecting/Buying/Processing Produces (Food, Inc.)

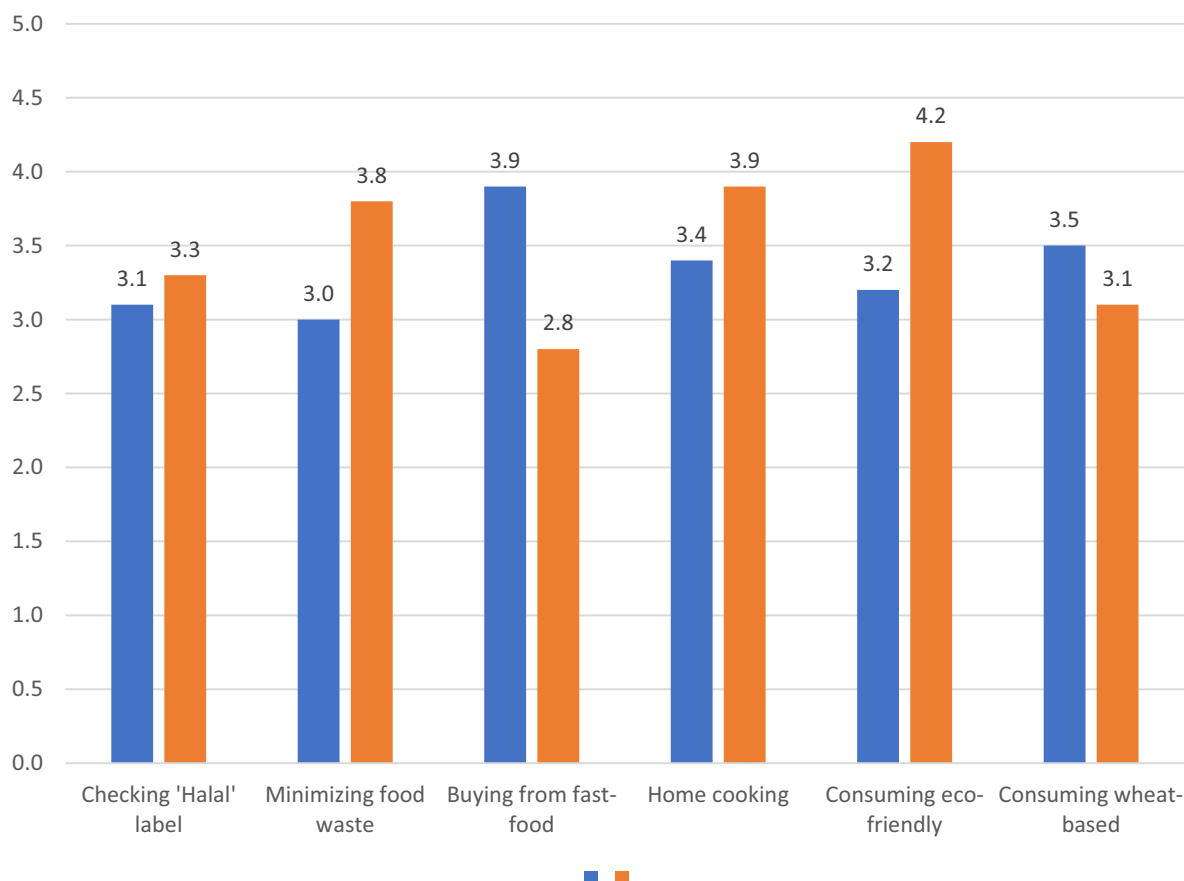


FIGURE 3

Illustration of change of motives after watching Food, Inc. Bars represent mean scores on a 5-point Likert scale (1 = strongly disagree, 5 = strongly agree).

4.5.5 Mixed ANOVA: formal comparison of film effects

To provide a formal statistical test of our second hypothesis regarding differential effectiveness between film genres, we conducted a 2×2 mixed repeated measures ANOVA with Time (pre-test vs. post-test) as a within-subjects factor and Film Type (documentary vs. fiction) as a between-subjects factor.

For perception scores, the analysis revealed a significant main effect of Time, $F(1, 30) = 25.67, p < 0.001, \eta^2 = 0.461$, indicating that both films produced significant changes in perceptions. More importantly, there was a significant Time $\times$ Film Type interaction, $F(1, 30) = 8.24, p = 0.007, \eta^2 = 0.216$, confirming that the two films differed significantly in their effects on audience perceptions. Post-hoc comparisons showed that while both films produced significant increases in perception scores, the fiction film (Okja) produced a significantly larger change ($\Delta M = 2.06, SE = 0.55$) than the documentary film (Food, Inc.) ($\Delta M = 1.39, SE = 0.59$).

Domain-specific ANOVAs revealed that the Time $\times$ Film Type interaction was particularly strong for animal welfare perceptions, $F(1, 30) = 12.73, p = 0.001, \eta^2 = 0.298$, with Okja producing significantly

larger effects than Food, Inc. For perceptions related to business practices and human health, the interaction was not significant, $F(1, 30) = 1.86, p = 0.183, \eta^2 = 0.058$.

For belief scores, the analysis showed a non-significant main effect of Time, $F(1, 30) = 3.41, p = 0.075, \eta^2 = 0.102$, consistent with our earlier finding that neither film significantly altered beliefs. The Time $\times$ Film Type interaction was also non-significant, $F(1, 30) = 0.77, p = 0.387, \eta^2 = 0.025$, indicating that the two films did not differ significantly in their (minimal) effects on audience beliefs.

These findings provide formal statistical support for our second hypothesis that different film genres would show varying effectiveness in influencing audience perceptions, with the fiction film demonstrating stronger effects particularly in domains related to animal welfare.

4.6 Analysis of food consumption motivations

Building on our findings regarding perceptions and beliefs, we examined shifts in participants' stated motivations related to specific

Change of Perceptions Regarding Unsustainable Aspects of The Existing Food System (Food, Inc)

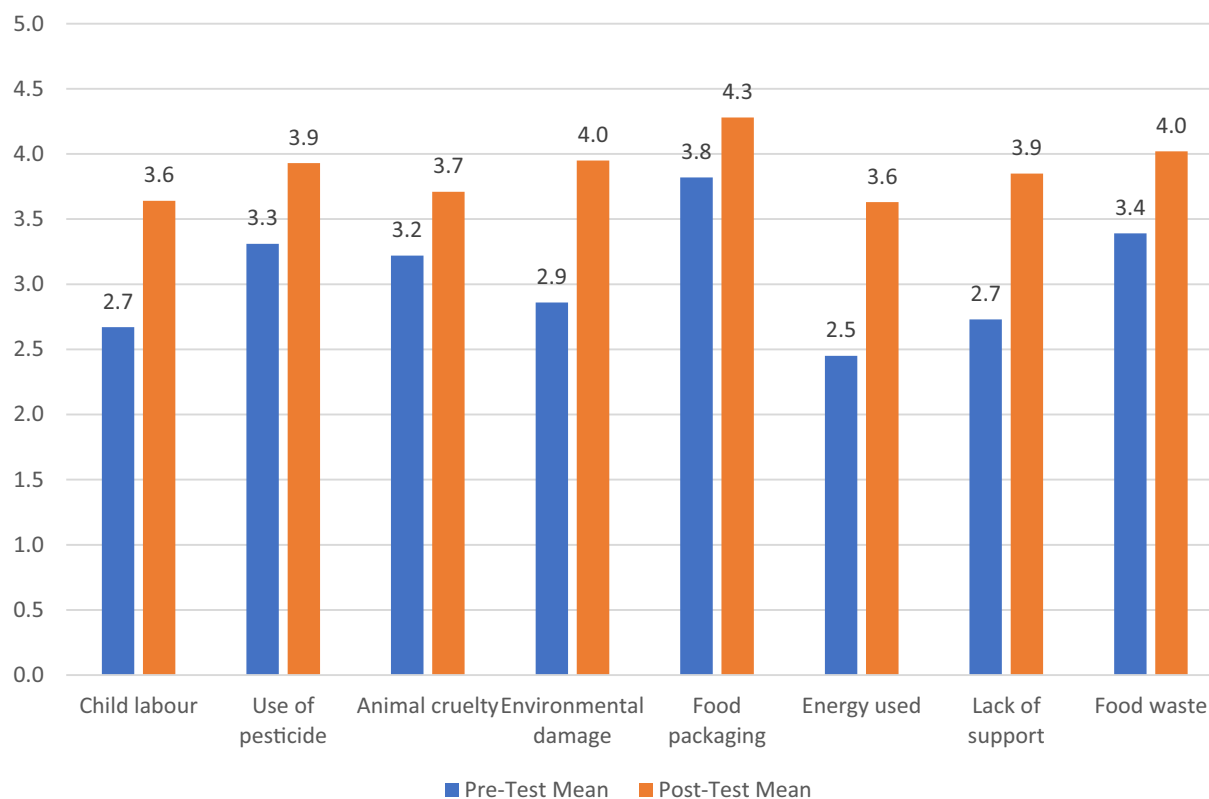


FIGURE 4

Illustration of change of perceptions after watching Food, Inc. Bars represent mean scores on a 5-point Likert scale (1 = strongly disagree, 5 = strongly agree).

food consumption behaviors. Unlike the standardized scales measuring beliefs and perceptions, we analyzed motivation data through frequency analysis to capture directional shifts in behavioral intentions.

4.6.1 Shifts in food consumption motivations after viewing Food, Inc.

After viewing Food, Inc., participants exhibited notable shifts in several food consumption motivations. Contrary to what one might expect, the motivation to consume poultry products increased slightly from 87.1% of participants in the pre-test to 90.3% in the post-test. Likewise, the motivation to purchase food from retail stores rose from 96.8 to 100%. These counterintuitive findings suggest that exposure to the documentary does not necessarily translate directly into anticipated behavioral intentions. Instead, participants may have reflected the film's emphasis on food system reform rather than individual consumption changes (see Table 4).

4.6.2 Shifts in food consumption motivations after viewing Okja

Following exposure to Okja, participants demonstrated different patterns of motivational shifts compared to Food, Inc. Most notably, 96.8% of participants maintained their motivation to purchase food

from retail stores despite the film's critical portrayal of corporate food production. However, participants reported increased motivation to consume eco-friendly produce (from 72.4 to 83.9%) and heightened attention to halal certification (from 64.5 to 77.4%) (see Table 5).

4.6.3 Comparing motivational effects of documentary vs. fiction film

When comparing the motivational impacts of the two films, we observed distinct patterns that complement our findings regarding perception changes. Food, Inc. produced stronger motivational shifts related to structural food system concerns (e.g., supporting local producers increased from 67.7 to 83.9%), while Okja generated stronger shifts in ethically-oriented motivations (e.g., considering animal welfare in purchasing decisions increased from 58.1 to 80.6%).

These differential effects suggest that while both films influence food consumption motivations, they do so through different pathways—the documentary primarily through systemic awareness and the fiction film through emotional and ethical engagement (see Table 6).

This comparative analysis reveals complementary patterns of influence that align with the distinct narrative approaches of each film.

Change of Motives in Selecting/Buying/Processing Produces (OKJA)

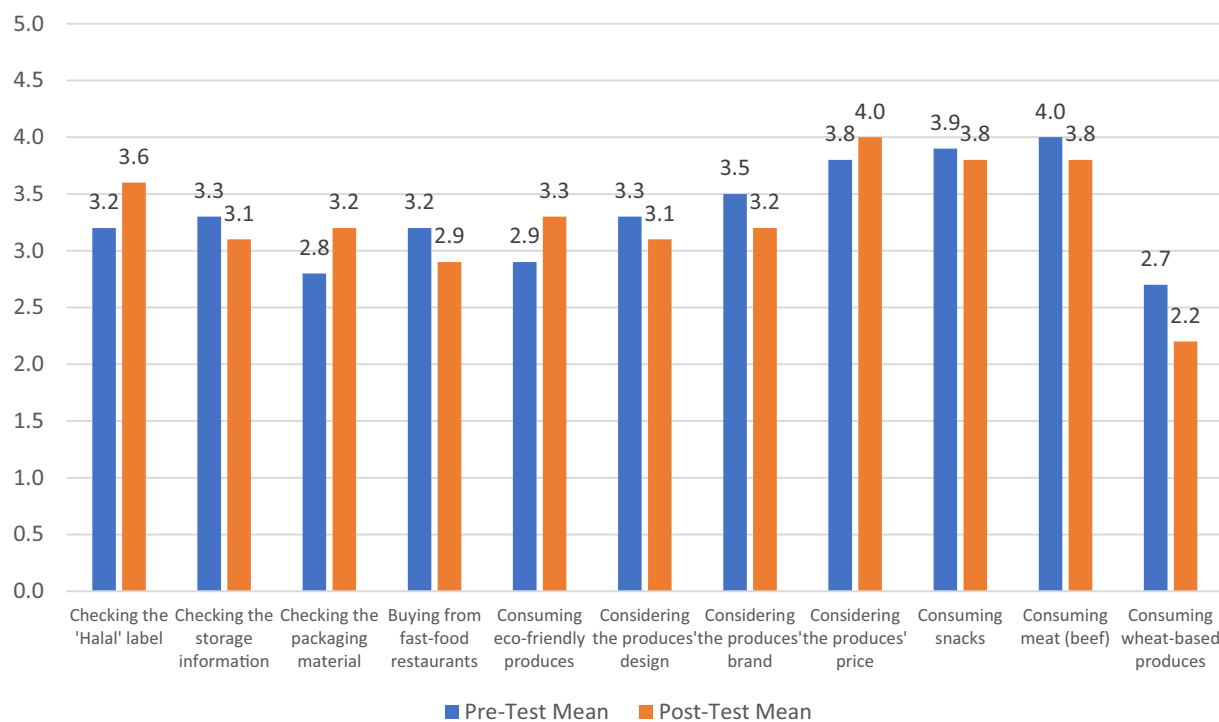


FIGURE 5

Illustration of change of motives after watching OKJA. Bars represent mean scores on a 5-point Likert scale (1 = strongly disagree, 5 = strongly agree).

Food, Inc. demonstrated stronger effects on motivations related to structural food system awareness, such as supporting local producers (+16.2 percentage points) and engaging with corporate retail. These effects are consistent with the documentary's emphasis on systemic analysis and industry practices.

In contrast, Okja exhibited significantly stronger effects on ethically-oriented motivations, particularly regarding animal welfare considerations (+22.5 percentage points) and eco-friendly choices (+12.9 percentage points). The fiction film also resulted in more substantial decreases in motivation for animal product consumption and fast food consumption. These patterns align with Okja's narrative emphasis on animal rights and corporate ethical responsibility.

Interestingly, neither film significantly altered motivation to purchase from retail stores, suggesting that participants recognized the practical constraints of food acquisition despite increased awareness of problematic aspects of the industrial food system. This finding reflects the complex relationship between awareness, motivation, and behavioral feasibility that environmental communication research has previously identified (Howell, 2014; Janpol and Dilts, 2016).

The overall pattern of motivational changes reinforces our findings regarding perception changes, with the documentary more effectively influencing system-level considerations while the fiction film more powerfully affected ethical and emotional dimensions. These complementary effects suggest that environmental

communication strategies might benefit from employing both documentary and narrative approaches to engage different aspects of audience cognition and motivation.

5 Discussion

Our experimental study examining the effects of documentary and fiction films on audience perceptions of food system issues revealed several significant findings. The analysis demonstrated that while both films effectively increased audience knowledge about food system and sustainability issues, they did so through different mechanisms and with varying degrees of effectiveness. The documentary Food, Inc. proved particularly effective in conveying systemic understanding and industry knowledge, while Okja showed superior impact in fostering emotional engagement and ethical awareness. These distinct but complementary effects suggest that different film genres serve unique roles in environmental communication.

5.1 Media effects and the filmic persuasion

Our findings indicate that the experience of watching Food, Inc. and Okja resulted in an increase in audience knowledge regarding

Change of Perception Regarding Unsustainable Aspects of The Modern Food System (OKJA)

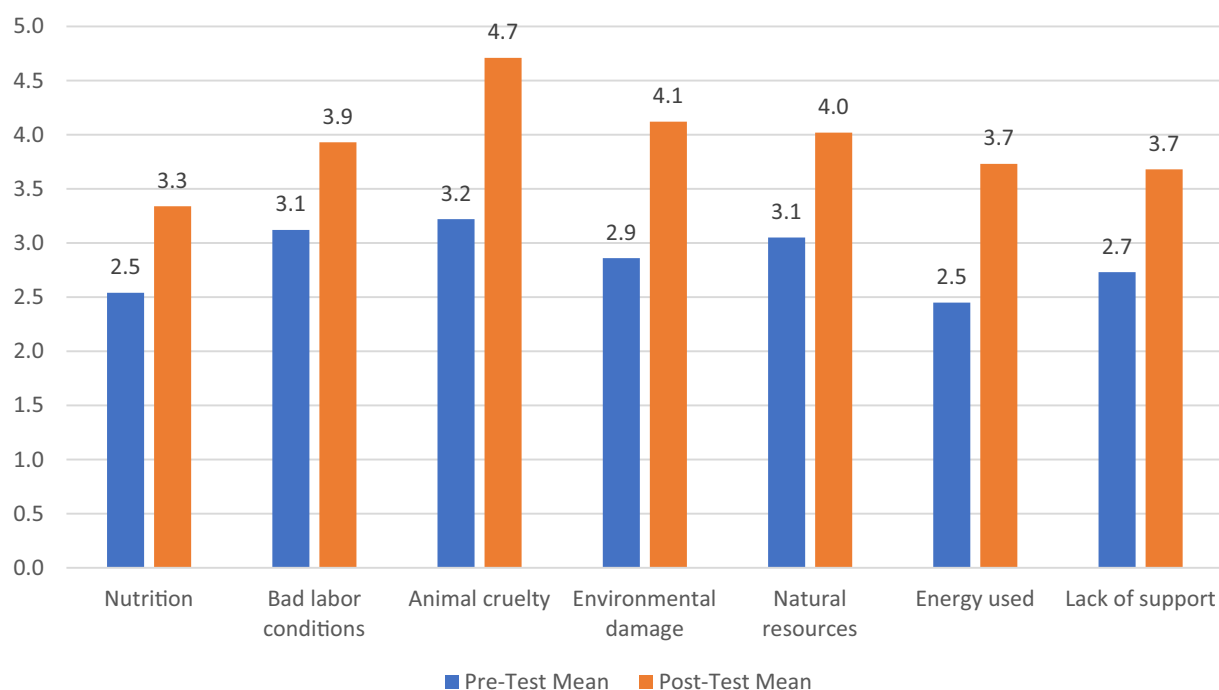


FIGURE 6

Illustration of change of perceptions after watching OKJA. Bars represent mean scores on a 5-point Likert scale (1 = strongly disagree, 5 = strongly agree).

TABLE 4 Changes in food consumption motivations after viewing Food, Inc.

Motivation item	Pre-test (%)	Post-test (%)	Change (percentage points)
Consuming poultry products	87.1	90.3	+3.2
Purchasing food from retail stores	96.8	100.0	+3.2
Consuming wheat-based products	77.4	71.0	−6.4
Visiting fast-food restaurants	80.6	67.7	−12.9
Consuming eco-friendly produce	74.2	80.6	+6.4
Considering halal certification	64.5	71.0	+6.5
Supporting local producers	67.7	83.9	+16.2

Values represent percentage of participants indicating motivation to engage in each behavior (ratings of 4 or 5 on a 5-point Likert scale).

TABLE 5 Changes in food consumption motivations after viewing OKJA.

Motivation item	Pre-test (%)	Post-test (%)	Change (percentage points)
Consuming poultry products	87.1	83.9	−3.2
Purchasing food from retail stores	96.8	96.8	0.0
Consuming wheat-based products	77.4	67.7	−9.7
Visiting fast-food restaurants	80.6	64.5	−16.1
Consuming eco-friendly produce	74.2	87.1	+12.9
Considering halal certification	64.5	77.4	+12.9
Supporting local producers	67.7	80.6	+22.5

Values represent percentage of participants indicating motivation to engage in each behavior (ratings of 4 or 5 on a 5-point Likert scale).

TABLE 6 Comparative analysis of motivational effects between documentary and fiction film.

Domain	Food, Inc. effect	Okja effect	Difference
Consumption patterns			
Animal product consumption	Slight increase (+3.2)	Moderate decrease (−3.2)	Okja more effective
Fast food consumption	Moderate decrease (−12.9)	Strong decrease (−16.1)	Okja more effective
Ethical considerations			
Eco-friendly choices	Slight increase (+6.4)	Strong increase (+12.9)	Okja more effective
Animal welfare consideration	Minimal change (+3.2)	Strong increase (+22.5)	Okja substantially more effective
Structural awareness			
Local producer support	Strong increase (+16.2)	Moderate increase (+9.7)	Food, Inc. more effective
Corporate retail engagement	Slight increase (+3.2)	No change (0.0)	Food, Inc. slightly more effective

food system and food sustainability issues. Changes in perception of specific issues that contribute to the unsustainable aspects of the contemporary food system indicate the increase. This demonstrates that both documentary and narrative films are capable of fulfilling the educational role of environmental communication. However, the ability to engage in pedagogical activity does not guarantee that it is pedagogically appropriate.

The application of the Stimulus-Organism-Response (S-O-R) framework to our findings reveals important insights about media effects in environmental communication. The significant changes in perception without corresponding changes in beliefs suggest that film's immediate impact operates primarily at the perceptual level rather than the belief level. This finding aligns with recent research indicating that media effects on environmental attitudes often occur through a two-step process: first affecting perceptions, which may then gradually influence beliefs over time (Nolan, 2010; Howell, 2014; Janpol and Dilts, 2016).

The stronger emotional engagement demonstrated by Okja supports emerging theories about the role of narrative transportation in environmental communication. As Lindenfeld (2010) and Rostek and Frentz (2009) suggest, films may be particularly effective in promoting environmental awareness through their ability to create emotional connections and personal relevance. This emotional engagement might serve as a crucial bridge between knowledge acquisition and potential behavior change, although as Nolan (2010) and Howell (2014) note, such engagement does not always translate into sustained behavioral change.

Regarding our prediction that participants will change their food consumption habits after viewing the films, both the increase and decrease of motivations in selecting/ purchasing/ processing produce support our hypothesis. The change in motivation does not necessitate a change in the participants' consumption habits. The shift in motivation is indicative of a shift in belief regarding what should be altered in their daily consumption behavior. For instance, after viewing both films, the majority of the audience is persuaded that they should reduce their wheat-based produce consumption, reduce their visits to fast-food restaurants, consume more eco-friendly produce, and become more conscious of the Halal-ness of their food.

The stimulus-organism-response methodology utilized in this study is based on the premise that mass media exerts powerful effects. According to Esser (2008), in this model, media messages are viewed as "symbolic bullets" that strike every eye and ear, resulting in direct, immediate, uniform, and therefore potent effects on thought and

behavior. The direct effect theory of mass media is frequently criticized for its assumption that the audience's behavior upon exposure to a particular media message is passive and predictable. The significance of this study is that it demonstrates that although a predictable shift in perception occurred, there was no significant shift in belief.

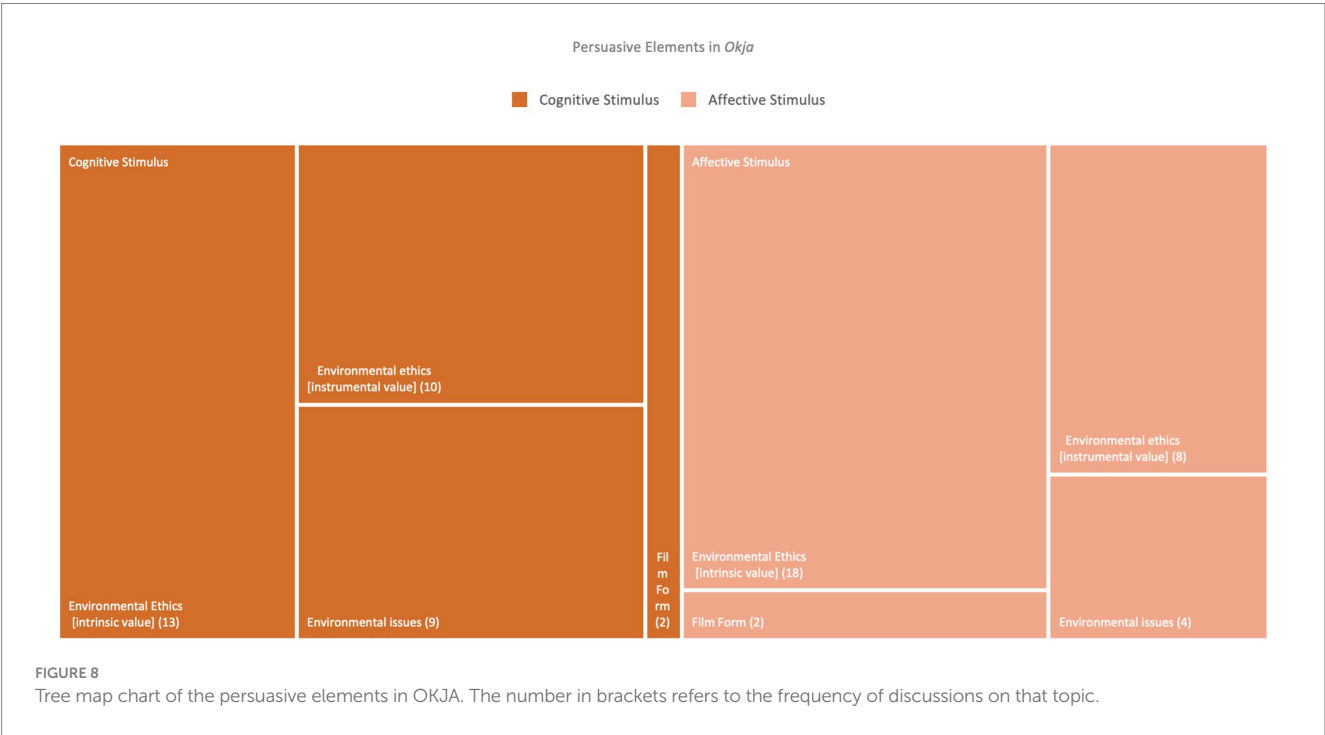
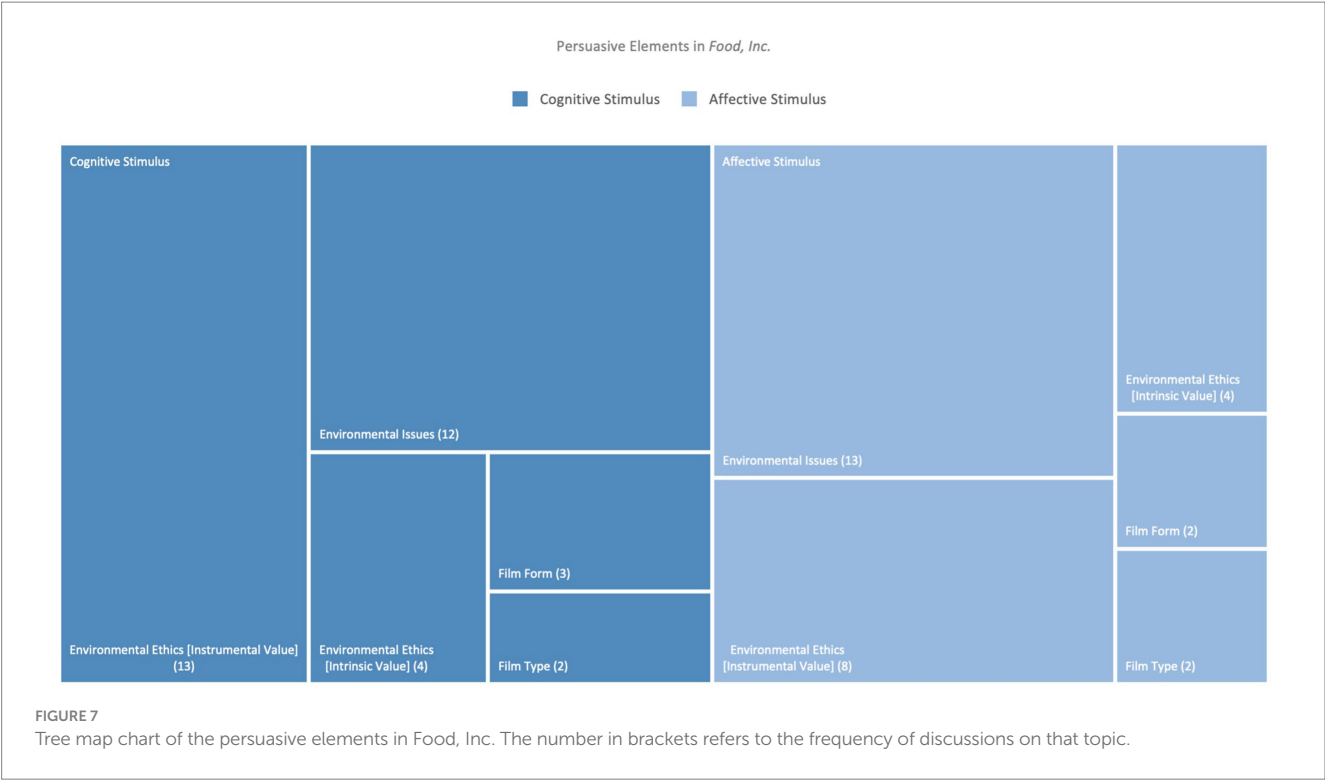
For instance, a common prediction is that after watching Food, Inc., people will reduce their consumption of poultry. However, our data indicate an increase in the motivation to consume poultry, from 87.1% of pre-test respondents to 90.3% of post-test respondents. Another common assumption is that after viewing Food, Inc. and Okja, individuals will be convinced to reduce their support for large food retailers such as supermarkets and hypermarkets. However, our data indicate that after viewing Food, Inc., respondents' motivation to purchase food from retail stores increases from 96.8 to 100%. Despite watching Okja, 96.8% of respondents remain unconvinced that they should alter their food purchasing habits from retail stores.

If a shift in perception is evidence of knowledge acquisition, then a shift in motivation and conviction is evidence of moral persuasion. The use of moral framing in filmic depictions of environmental issues is unavoidable given the current state of environmental communication research (Gordon and Hunt, 2019). Since describing the (in)justice in the current food system is already a moral position in which justice is considered morally good and injustice is considered morally bad.

In literatures on environmental ethics, the distinction between instrumental value and intrinsic value is crucial to comprehending the relationship between humans and nature. Instrumental value, according to Brennan and Lo (2024), refers to the value of things as means to other ends, whereas intrinsic value refers to the value of things as ends in themselves, regardless of whether they are also useful as means to other ends. This distinction is useful for mapping our data regarding the aspects of a film that audiences find persuasive. Specifically, filmic persuasions that make them think critically about food system issues (cognitive stimulus) and make them care about food system issues (emotional stimulus) (affective stimulus).

Figures 7, 8 provide visual representations of the frequency with which audiences discuss filmic persuasions. The responses to the open-ended questions are collected and categorized into two types of stimulus: cognitive stimulus and affective stimulus. Following that, we classify the topics as follows:

1. Environmental issues refers to topics that are primarily concerned with human health.



2. Environmental ethics refers to topics that are framed in moral terms (good/evil practice). We divided them into Instrumental value (good/ evil practice for humans) and Intrinsic value (good/evil practice for nature/animals).

3. Film form refers to responses that discuss the role of film form (narrative/style) in cognitively/emotionally persuading them.
4. Film type refers to responses that discuss the film type (documentary/fiction) in persuading them cognitively/ affectively.

According to our data, the discussion of environmental issues (health concerns) and instrumental-value-laden environmental ethics in *Food, Inc.* was deemed the most persuasive by the majority of

participants (business ethics and politics). While *Okja* is considered the most persuasive due to its discussion of intrinsic-value-laden environmental ethics (animal rights). Given the formats of the films, this result is predictable.

5.2 Genre-specific impact

The differential impact of documentary and fiction films observed in our study carries important implications for environmental communication strategies. *Food, Inc.*'s effectiveness in conveying systemic understanding aligns with traditional documentary strengths in providing factual, contextualized information. The film's impact on instrumental-value environmental ethics suggests that documentaries may be particularly suited for addressing policy-oriented and systemic aspects of environmental issues.

In contrast, *Okja*'s superior effectiveness in emotional engagement and intrinsic-value environmental ethics indicates that fiction films might offer unique advantages in promoting deeper ethical reflection and personal connection to environmental issues. This finding aligns with Opel (2007) and Bahk (2010) research on narrative approaches in environmental communication, while supporting Joon Ho (2017) innovative use of mixed genres to address global environmental problems. Furthermore, as Gordon and Hunt (2019) suggest, such approaches may be particularly effective in highlighting the systemic (in)justices within food systems.

The media logic theory asserts that common media formats and styles facilitate world perception. The prevalence of certain media formats indicates how culture employs particular media types or styles to interpret reality (University of Minnesota, 2016). In addition, according to Altheide (2016), "media logic refers to the assumptions and processes underlying the construction of messages within a given medium. This includes meter, grammar, and structure." Regarding film formats, Bordwell et al. (2024) makes an insightful distinction between film categories. We can classify them according to their type (documentary, feature-length, animation, experimental) and genre (drama, comedy, musical, etc.).

As a rhetorical documentary, *Food, Inc.* frames the unsustainable food system as a moral issue through the use of a persuasive argument. *Food, Inc.*'s rhetoric is viewer-centered, appealing not only to the audience's intellect but also to their moral emotions. According to our data, this deliberate communication strategy has a positive outcome, as the participants consider the moral framing of food system issues to be what makes the film persuasive. In particular, with regard to the issue of how government and corporations create unsustainable food systems that are not only harmful to people or consumers, but also harmful to the environment. The narrative of injustice is implied by emphasizing the combination of unethical business practices and corrupt politics.

In *Okja*, the narrative conventions of the drama genre are utilized as a moral fable between the oppressed and the oppressor. Mija and *Okja* are portrayed as victims, whereas Mirando is portrayed as the oppressor whose business practices abused *Okja*. Our data indicate that the discussion of environmental ethics, particularly the intrinsic value of animals, is what makes *Okja* persuasive, so this communication strategy achieves its anticipated objective.

Although near the end, *Food, Inc.* is quite explicit in calling for a change in people's consumption habits, its rhetoric is designed to

persuade the audience. We must emphasize that what the film actually does is not necessarily equivalent to what it intends to do. Based on the responses in our data and our analysis of its documentary format, *Food, Inc.* functions as a pedagogical tool for understanding environmental issues through a foundational knowledge of environmental ethics. Similarly, the film *Okja* fails to persuade people to change their food consumption habits. Instead, it is a moral fable highlighting the issue of animal cruelty in the current meat industry.

5.3 Environmental ethics and communication strategy

This research reveals one intriguing insight. We can observe a paradigm shift in the teaching of environmental ethics through film if we consider the films' production periods in chronological order. *Okja* attempts to argue for an ethics that considers the animals' rights to live and die well, whereas *Food, Inc.* is part of a trend in food documentaries from the mid-2000s in which nature and animals are viewed as instruments to fulfill human needs for nutrition and health (instrumental-value-laden). Specifically, *Okja* promotes what is known as enlightened anthropocentrism. This view holds that all of our moral obligations to the environment are derived from our direct obligations to the environment's human inhabitants. This perspective is primarily conveyed through the relationship between Mija and *Okja*. Mija is so determined to save *Okja* not only because she believes in *Okja*'s right to live, but also because she views herself as *Okja*'s friend and thus feels obligated to do so.

Brennan and Lo (2024) argue that the purpose of environmental ethics is to provide moral justification for social policies aimed at protecting the environment and reversing environmental degradation. Considering the media logic and media effects of both films, neither is effective at altering people's daily behavior. Instead, they function as a form of cinematic persuasion to promote social agendas that respond to the call for a more ethical relationship with the planet's environment.

5.4 Practical implications

Our findings suggest several practical implications for environmental communication practitioners:

First, the choice of film genre should align with specific communication objectives. Documentaries may be more appropriate for educational contexts requiring systemic understanding, while fiction films might be more effective for fostering emotional engagement and ethical awareness.

Second, the complementary strengths of different genres suggest potential benefits in using both formats within comprehensive environmental communication strategies. This multi-genre approach might help address both cognitive and affective aspects of environmental engagement.

5.5 Limitations and future research directions

Several limitations of this study should be noted. The sample's homogeneity (undergraduate film students) may limit generalizability

to broader populations. The short-term nature of the measurements cannot address potential long-term effects on beliefs and behaviors. Additionally, the sequential viewing of both films may have created order effects that future research should control for.

Several limitations of this study warrant consideration when interpreting the findings. First, the sample's homogeneity—comprising undergraduate film students with a gender imbalance (71% male)—limits generalizability to broader populations. The specialized knowledge and analytical skills of film students may have influenced their reception of the films in ways that differ from general audiences. Second, the short-term nature of our measurements provides a snapshot of immediate responses but cannot address potential long-term effects on beliefs, perceptions, or behaviors, which environmental communication research suggests often develop over extended periods (Howell, 2014). Third, the sequential viewing design, while resource-efficient, introduces potential order effects that may have influenced responses to the second film (*Okja*). Although our analytical strategies partially mitigated these concerns through baseline comparisons and individual trajectory analysis, a between-subjects design would have provided cleaner isolation of each film's effects. Finally, our measures of behavioral intentions relied on self-reported motivations rather than observed behaviors, which may be subject to social desirability bias. Future research addressing these limitations could substantially advance understanding of environmental film effects through longitudinal studies examining long-term effects, cross-cultural comparisons of film genre effects, investigation of mediating variables between perception change and behavior, and examination of how different audience characteristics might moderate film impacts.

6 Conclusion

Numerous studies have demonstrated environmental films' ineffectiveness in altering people's behavior, either in purchasing carbon offsets voluntarily (Jacobsen, 2011) or in predicting their environmental concerns (Janpol and Dilts, 2016). It is a common belief that the purpose of film as a propaganda tool is to influence audiences to act in accordance with the message propagated by the film. In media studies, this direct-effect model of communication is considered to assume too much audience passivity.

This study demonstrates that although research based on this model may result in predictable 'change' on the part of the audience, there is nuance involved. Our research demonstrates that although perception change is predictable, belief change is more difficult to predict.

This study also challenges the notion that the intention of the filmmakers is sufficient to determine the purpose of environmental films. We argue that environmental films must be viewed as a form of environmental communication with their own moral and political agenda. How the film influences its audience through engagement with its form does not necessarily correspond with the filmmakers' intentions. In the analysis of media influence, the former considers both media logic (the film form) and media effects (the audience), whereas the latter only considers pre-filmic intentionality.

In actuality, Food, Inc. and *Okja* engage in moral pedagogy to promote environmental ethics by narrating the injustices of the existing food system. The purpose of environmental ethics in practice

is not to directly influence individual behavior, but rather to influence social change through policies. This objective is achieved by providing a moral foundation for more ethical environmental policies. Food, Inc. provides a moral basis for considering the anthropocentric position of environmental ethics, while *Okja* provides a moral basis for considering the enlightened-anthropocentric position.

Despite the numerous criticisms that have been leveled against the direct-effect model of media theories, we continue to believe that it is a useful starting point for accurately describing the extent of media-induced change. In addition, this model facilitates empirical research in order to comprehend how the audience perceives the media and how opinions are formed or altered through it. However, we recognize our inability to provide enough empirical evidence to fully comprehend the 'change' in the audience's beliefs and perceptions. Moreover, this study has only provided a very basic understanding of environmental ethics. It will be intriguing to see additional research examining the various moral grounds that can be applied to the development of an environmental policy for a particular region, as well as the various ethical issues in environmental communication.

Data availability statement

The original contributions presented in the study are included in the article/[Supplementary material](#), further inquiries can be directed to the corresponding author.

Ethics statement

The studies involving humans were approved by the Ethical Review Committee of Unhas Press. The studies were conducted in accordance with the local legislation and institutional requirements. The participants provided their written informed consent to participate in this study.

Author contributions

NM: Conceptualization, Formal analysis, Investigation, Supervision, Validation, Writing – original draft, Writing – review & editing. II: Data curation, Methodology, Resources, Software, Visualization, Writing – original draft, Writing – review & editing.

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Supplementary material

The Supplementary material for this article can be found online at: <https://www.frontiersin.org/articles/10.3389/fcomm.2025.1519348/full#supplementary-material>

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