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Eudaimonic entertainment as new Enlightenment: Critical thinking as a mind-set effect of narratives

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We propose to extend the theoretical concept of eudaimonia as a media effect with critical thinking as a mind-set effect. Critical thinking as a mind-set effect means that media narratives can stimulate viewers and readers to think critically in any situation, even outside of the exposure situation and applied to other topics. It denotes a generally heightened critical attitude or “mind-set” to approach issues and situations by taking different pieces of information into account, weighing and analyzing them, developing one’s own arguments and drawing conclusions. People with this mind-set try to be well-informed, use credible sources and observations, are alert for alternatives, open-minded, maintain and change views according to evidence, and are motivated to hold accurate beliefs. In this article, we provide a theoretical elaboration of the idea of critical thinking as a mind-set effect, and connect it to traditions of Enlightenment literature as well as theoretical approaches on narrative effects. We also present data from a qualitative pilot study using the film “Don’t look up” to explore the potential of such an extension of eudaimonic entertainment. Finally, we discuss implications of introducing critical thinking as a mind-set effect for narrative persuasion.

KEYWORDS

media narratives, narrative persuasion, critical thinking, eudaimonic entertainment, Enlightenment

Introduction

Stories are tightly connected to human existence and thinking. Being able to represent events and characters symbolically—to tell a story—is a unique and deeply human feature (Gottschall, 2012). For societies and individuals, stories serve the function to simulate social situations, relationships, and emotions, rehearse empathy and social actions, thus providing valuable experiences outside of one’s own range of reality (Hutto, 2008; Mar and Oatley, 2008; Boyd, 2009). Stories are generally defined as representations of events and characters contextualized in space and time (Abbott, 2008).

As a natural mode of thinking, stories are particularly close to everyday life and direct experience (Bruner, 1986, p. 259). Often, the narrative mode is contrasted with a logic, abstract, scientific mode of thinking (“paradigmatic”), which seeks to provide descriptions and explanations, generalizations and abstractions (Bruner, 1986).

While the two modes—narrative and paradigmatic mode of thinking—can be constructed as oppositional, there are some connections and intersections. Stories can show how characters themselves think in a rational mode, and, doing so, succeed or fail in their goals, just as Sherlock Holmes, the detective mastering in logic reasoning created by Arthur Conan Doyle solves his mysteries by ingeniously figuring out crime puzzles. Stories can show the consequences of non-rational thinking or conflicts between rational and non-rational actors. One of the most famous films in this category is the immensely successful “Day After Tomorrow” (Emmerich, 2004), in which scientists warn about an impending climate catastrophe, and, unheard by politicians, must witness the beginnings of a new ice age. In this situation, readers or viewers do not process a text written in paradigmatic mode, but they process a narrative text containing plots and characters that use the paradigmatic mode.

Media use is both motivated by seeking “pleasure and amusement (hedonic motivation)” and by seeking “life’s meaning, truths, and purposes”—a eudaimonic motivation (Oliver and Raney, 2011, p. 985). In terms of gratifications obtained, these motivations correspond to enjoying and appreciating media content, respectively (Bartsch and Oliver, 2017). Enjoyment as a media outcome may feed into hedonic happiness that is geared toward creating pleasure, enjoyment, satisfaction and reducing pain and effort (Huta, 2015). Appreciation as a media outcome contributes to eudaimonic happiness that is built on aspects such as finding meaning and considering values, personal growth, self-realization and maturity, achieving excellence and living in line with ethics and living an autonomous and authentic life (Huta and Waterman, 2014; Huta, 2015). Eudaimonic happiness in particular improves several aspects of health and wellbeing, including longevity, risk for diseases, and mental health (Ryff, 2018); eudaimonic media experiences similarly improve wellbeing, connectedness with others and prosocial behaviors (Raney et al., 2019).

We propose to extend the theoretical concept of eudaimonia as a media effect (Raney et al., 2019) to go beyond media’s direct contributions to eudaimonic happiness (e.g., to stimulate meaningful affect or contribute to meaning making). Instead, we suggest that critical thinking as a mind-set effect is another facet of eudaimonic entertainment experience. Critical thinking describes the “mental activities of thinking and the various representations of the thinking that include action, speech, writing and so on” and reflects the “capacity to work with complex ideas” (Moon, 2008, p. 126). Activities of critical thinking include reviewing someone else’s argument, evaluating an object or situation, drawing one’s own conclusions or thinking critically about oneself (Moon, 2008, p. 31ff). We propose that critical thinking can be observed in narratives (as any other symbolically represented activity) and can stimulate critical thinking in the viewer or reader—even outside of the exposure situation. While very different pathways to eudaimonic

happiness exist (e.g., through meaning-making, or affect like awe or hope) critical thinking supports several facets of eudaimonic media experiences: For example, it can lead to a greater sense of autonomy by enabling a person to evaluate situations by their own standards and come to their own conclusions. Or it can add to personal growth by increasing one’s horizon and shaping well deliberated views.

We suggest that media narratives can stimulate viewers and readers to be more sensitive and mindful to think critically in any situation. This effect is not tied to exposure nor is it restricted to the topic in the narrative. It should be considered a generally heightened critical attitude or “mind-set” of being critical. We assume that narratives specifically have the ability to generate eudaimonic entertainment experiences generally and critical thinking specifically. We emphasize that no fixed set of properties can identify narrative content as being “eudaimonic narratives”. Although some properties make eudaimonic entertainment experiences more likely, it is still the viewer or reader whose perception as meaningful makes an experience eudaimonic. Thus, we do not seek to identify “eudaimonic narratives”, but investigate eudaimonic entertainment experiences that originate from narratives.

While not part of contemporary media effects or theorizing on eudaimonic effects, our concept of critical thinking as a mind-set effect builds on the usage of literature in the era of Enlightenment, where philosophers did not only write treatises, but made use of novels and drama to spread ideas of rationalism, freedom, tolerance, science, and morality (Munck, 2000).

In this article, we will elaborate critical thinking as a mind-set effect, and connect it to traditions of Enlightenment literature as well as theorizing on narrative effects. We also present data from a qualitative pilot study using the film “Don’t look up” (McKay, 2021) to explore the potential of such an extension of eudaimonic entertainment. Finally, we discuss implications of introducing critical thinking as a mind-set effect for narrative persuasion.

Critical thinking as a mind-set effect

Critical thinking is mostly discussed in the context of education; especially at higher levels of education, it is considered as a central objective of learning and essential groundwork for any academic qualification (Moon, 2008). It is often discussed as relevant for different professional contexts such as health professions (Mann et al., 2009) or social work (Brown and Rutter, 2008), and also regarded as foundational for digital literacy and democratic functioning (Gainer, 2012). In the age of postmodern science (Funtowicz and Ravetz, 1993), critical thinking is essential to understand and participate in modern, science-based decisions.

Ennis (2015) defines critical thinking as “reasonable reflective thinking focused on deciding what to believe or do” (p.

32) and lists typical dispositions of critical thinkers such as trying to be well informed, using credible sources and observations, being alert for alternatives, being open-minded, maintaining and changing views according to evidence, and being motivated to hold accurate beliefs. Moon (2008) describes critical thinking as a process that includes the ability to take different pieces of information into account, weigh and analyze them and develop own arguments and draw own conclusions. She contends that critical thinking also includes a (self-)evaluative component: “Critical thinking is looking at one’s work or situation with value judgement—what did I do right or wrong? It is like criticizing oneself. It can also be applied to other people’s work—thinking where they are coming from; whether they are biased—do they have a vested interest?” (p. 31). Moon (2008) states that individuals, rather than aiming for objectivity, need to be aware of the inevitable presence of subjectivity in all knowledge processes. She presents a typology of representational activities that are based on critical thinking and that can count as expressions of critical thinking:

(1) Reviewing someone else’s argument encompasses scrutinizing the line of reasoning and evaluating the validity of the conclusion.

(2) Evaluating an object, e.g., a work of art, book or product, means that an observer considers properties of the object and eventually arrives at a judgment about it.

(3) Developing an argument signifies that the observer uses a specific selection of evidence, puts it into a reasonable order, draws their own conclusions and finally constructs an argument from this process.

(4) Thinking critically about the self involves a consideration and evaluation of one’s own thinking and behavior.

(5) Reviewing an incident, event or fictitious scenario entails that the observer rethinks the event and deliberates different courses of action and outcome.

(6) Engaging in constructive responses to the arguments of others means that thinkers revisit the argument of others and rehearse or put together a response to what others have proposed.

(7) Habitually engaging with the world departs from a single activity and rather constitutes a disposition. It stands for a vigilant, careful attitude toward incoming information, for perceiving and processing new information and reflecting on them as a routine, everyday practice.

Applying these representational activities of critical thinking to media content and effects, we can find relevant instances for each of these activities. Let us take the novel “State of Fear” by Crichton (2004) as an example to apply these critical activities. The book tells the story of eco-terrorists who plan attacks to raise awareness about climate change. It was heavily criticized for containing inaccurate and biased information on climate change and propagating conspiracy narratives. Whether readers process the book in a critical thinking mode or not, might make all the

difference in this example: Reading in an uncritical way implies that the climate skeptic position of the book is accepted; reading in a critical way implies that the climate skeptic position of the book is in some way countered. We will now present examples for each of the activities of critical thinking using “State of Fear” as an example.

Reviewing someone else’s argument could happen when a person reads the book, gets acquainted with conspiratorial climate skeptic thinking and makes up their mind about climate skepticism. *Evaluating an object* could arise when a person makes a judgment about the book, for example, concludes that the usage of footnotes in a novel is a tool to feign a scientific style or that the extensive elaboration of climate skeptic arguments in dialogues seems to serve an ideological bias rather than narrative requirements. A reader could then *develop an argument of their own* when thinking about and seeking evidence on climate change and reaching the conclusion that a climate conspiracy does not exist. The book can also encourage readers to *think about themselves*, for example, their own carbon footprint and ways in which to reduce it. Then, the book can be understood as a fictitious scenario (activity: *reviewing an incident*) that describes how a large amount of money is spent on acting against climate change, when in fact it does not exist. Critical thinking may then involve weighing different options of action, for example, seeking more information or seeking expert advice. Readers may also engage in *constructive responses to the arguments* of the climate skeptics and formulating a line of reasoning that effectively counters this position. Finally, *habitual engagement with the world* may be realized when readers approach any communication about climate change with more caution and scrutiny.

Apart from the actual activities, critical thinking is also regarded as a disposition or trait that drives a thinker toward “open-mindedness, fair-mindedness, independent-mindedness, intellectual modesty and humility, an inquiring attitude, and respect for others in group inquiry and deliberation” (Siegel, 2010, p. 141). Activities and dispositions are closely related and influence each other.

We assume that media narratives, especially such that are suitable to evoke eudaimonic experiences, can stimulate both singular activities of critical thinking and a more stable mind-set of being critical. In the latter case, similar media narratives could cumulate into small, long-term effects similar to cultivation (Busselle and Van den Bulck, 2019). They could have a small impact or none at all right after exposure and then increase over time similar to a sleeper effect (Pratkanis et al., 1988) or they could have a large effect right after exposure by providing sudden insight similar to the drench effect (Greenberg, 1988). In any case, we assume that all ways can lead to changing the mind-set with which we approach issues, select and process information.

Critical thinking and wellbeing

In research on eudaimonic media experiences and effects, reflection is central. First, media content can be perceived as thought-provoking and reflective thoughts in turn can contribute to a positive evaluation of media content in the form of appreciation (Oliver and Bartsch, 2010). Second, eudaimonic entertainment can evoke media experiences that strongly engage a reader's or viewer's cognitive faculties, a process similar to a slow, elaborate or systematic mode of processing information (Bartsch and Schneider, 2014; Lewis et al., 2014).

We suggested above that critical thinking can contribute to wellbeing in several ways. We will now use the six components of wellbeing by Ryff (2018) and demonstrate for each how critical thinking can contribute to wellbeing.

The first component is *environmental mastery*, which refers to the ability to “choose or create environments suitable to one's psychic needs” (Ryff, 2018, p. 378), for example to avoid noxious persons or detrimental media content. Here, critical thinking can help becoming aware of what is conducive to the psychic needs and what is not. While the process described here is geared toward conscious critical analysis and action, the idea is the same as pursued in approaches to mood management and adjustment (Knobloch-Westerwick, 2006).

The second component is *personal growth*. It describes one's own development over time, and entails self-realization and advancing one's personal potential. Critical thinking, as elaborated above, can involve critical thoughts about oneself, which in turn can contribute to personal growth by recognizing one's deficiencies or rooms for improvement.

The third component refers to *positive relationships with others* and includes being able to feel empathy with others and the ability to maintain friendships and love for others. Critical thinking can help to evaluate existing friendships and determine how to proceed with them.

The fourth component is purpose in life that encompasses entertaining a *sense of meaning and purpose in life*, as well as an *orientation toward general goals*. Critical thinking can, again through processes of evaluation and self-reflection, help with this task.

The fifth component is *self-acceptance*, which describes a positive attitude toward oneself, and making peace with one's past as well as negative sides. This component too benefits from evaluation and self-reflection, as well as reviewing someone else's argument when one receives negative feedback from others.

Finally, the last component is *autonomy* which foregrounds the “independent, self-determining, and self-regulating qualities of the person” (Ryff, 2018, p. 376) and which implies a certain emancipation of other people's judgments as well as norms and

conventions. This is certainly the aspect that is most clearly and explicitly connected to critical thinking as it includes conscious deliberation of complying or not complying common rules and developing a position of one's own.

The tradition of using narratives to create and support critical thinking

Well before empirical research was concerned with determining the effects of stories and even well before the disciplines existed that are concerned with narratives effects, stories were used to convey values, norms, and morality, for example, in religious books or tales, or inform about history and personalities important to a specific time and society. Today we have empirical evidence that stories are effective (Zebregs et al., 2015; Braddock and Dillard, 2016) and that engaged modes of processing the narratives such as transportation and narrative engagement enhance that effect (Tukachinsky and Tokunaga, 2012; van Laer et al., 2014).

While critical thinking is not part of the traditional range of narrative effects (Green et al., 2019), there is a historic literary tradition that makes use of the narrative format to convey messages about critical thinking. It is the Enlightenment, a philosophical era in Europe in the 18th century that advocated progressive ideas such as “religious toleration, liberty, individual rights, and intellectual, social and political progress” (de Bruyn, 2021, p. 8). Considering the many different strands of Enlightenment, with more radical variations from Parisian philosophers who put all traditional values to critical scrutiny to the more moderate German thinkers who reconciled religion, tradition and authority with practical modern ideas, Enlightenment is better understood as “an attitude of mind, rather than a coherent system of beliefs” (Munck, 2000, p. 7). Similarly, de Bruyn (2021) argues that the label Enlightenment does not stand for a unified position (e.g., anti-religion); if any generalizations can be made, it is about a similar stance toward the world: “A skeptical cast of mind supplanted superstition, and thinkers committed themselves to a scientific, empirical approach to intellectual inquiry [...]. The world has to be understood through the use of reason, rather than accepted on faith or traditional authority” (de Bruyn, 2021, p. 8). With an open mind and a sense of curiosity, reason served to examine traditional ideas and to gain insight by empirical study (Munck, 2000, p. 5).

Philosopher Immanuel Kant published a programmatic essay in 1784 to answer the question “What is Enlightenment?” and devised the often-cited principle of Enlightenment “Thinking for yourself”:

“Enlightenment is man's leaving his self-caused immaturity. Immaturity is the incapacity to use one's intelligence without the guidance of another. Such

immaturity is self-caused if it is not caused by lack of intelligence, but by lack of determination and courage to use one's intelligence without being guided by another. *Sapere Aude!* [Dare to know!] Have the courage to use your own intelligence is therefore the motto of the Enlightenment.

Through laziness and cowardice, a large part of mankind, even after nature has freed them from alien guidance, gladly remains immature. [...] It is so comfortable to be a minor! If I have a book which provides meaning for me, a pastor who has conscience for me, a doctor who will judge my diet for me and so on, then I do not need to exert myself. I do not have any need to think; if I can pay, others will take over the tedious job for me." (Kant, 1784/2014, p. 481).

So, the programmatic formulation of Enlightenment is not necessarily a political, social or scientific agenda, but a state of mind, a stance that enables and motivates humans to break from authority—another's guidance—and think for themselves.

One characteristic of Enlightenment is that some of its prominent writers did not only produce philosophical treatises, but were also authors of literary works such as novels and drama (Munck, 2000). While not all novels served as platforms for skeptical thought—some countering the epistemological crisis effected by scientific, political and social progress with comfortably unrealistic and irrational narrative worlds (Donoghue, 2002, p. 140f)—a strand of novels exists, many written by Enlightenment philosophers themselves that conveyed ideas of Enlightenment through an entertaining narrative format (Munck, 2000). Often, these narratives belonged to the genre of satire and sought to observe and criticize society, its ethics, customs and laws, religion and people from a distanced perspective—for example, told from the perspective of a stranger from another culture or a naïve person (Greenberg, 2019).

For example, French philosopher and writer Montesquieu was the author of one of the most influential political treatises in Enlightenment that set the groundwork for the modern state and elaborated the separation of powers, "De l'esprit des lois" (The spirit of the laws), published in 1748. Montesquieu is also author of an epistolary novel, "Les lettres persanes" (The Persian letters, 1721) that features 161 letters between two fictional Persians who left their hometown Isfahan for Paris and who converse about and critique cultural, religious and political conditions in France. The "Persian letters" are told from the perspective of strangers that provides a more distanced view and allows to question habits, customs and rituals.

Another example is Voltaire whose most influential work includes the "Lettres philosophiques" or "Lettres anglaises" (Philosophical letters, English letters, 1734). Formally a collection of letters, the work is more a compilation of essays, in which the writer expresses his admiration for the British nation that is more advanced in terms of civil liberties, religious tolerance and constitutional monarchy, at the forefront of

European intellectualism, in philosophy and science. He salutes a new type of human that is free, in actions and thought, and does not fear authority. Voltaire is also the author of the fictional novel "Candide" (1759), in which the protagonist, Candide, a simple-minded man, is banished from his home castle. He meets one misfortune after another and is only saved by the most unlikely coincidences. The novel criticizes and ridicules arrogant nobility, religious inquisition, war, and slavery.

Progressive ideas were spread through the rhetoric channels taking the form of treatises, books and pamphlets, but also through entertaining, easy to understand formats, novels and plays, making Enlightenment as much a philosophical and political enterprise as a literary era.

Today, calls for a "new Enlightenment" surface (Pinker, 2018): With ideology, extreme religiosity and anti-science movements gaining traction, and authoritarian leaders becoming popular across the globe, there is reason to revisit Enlightenment as a call for critical thinking. We argue that "new Enlightenment"—just as "old Enlightenment"—can be related through entertainment that demasks and possibly humorously ridicules current circumstances. We propose that such narratives do not just stimulate to reflect on a certain topic, but may serve as a call to "think for yourself", to think critically in general.

The descriptions of Enlightenment's "Think for yourself" resonate with the descriptions of critical thinking. Having a critical and inquisitive mind-set, emancipating oneself from self-evident and habitual ideas and arriving to one's own conclusions is central to both approaches. At the same time, both the Enlightenment and critical thinking approaches emphasize that liberation from traditions and norms are a sign of a modern and mature individual—and thus address one important dimension of wellbeing and eudaimonic happiness: autonomy that describes individuals as independent and self-determining beings, ready to make their own ways through the maze of social conventions. Also, "thinking for yourself" feeds into personal growth when people take on the hardship to stand on their own feet, and not to rely on others to do the work for them—and ultimately achieve their own potential. Similarly, purpose in life may also be a dimension of wellbeing that is promoted by "thinking for yourself": Thinking independently of customs and conventions may uncover and foreground the truly relevant goals in life rather than following habits and being entrenched in everyday life without considering the greater picture.

As in "old" Enlightenment literature, today's modern narratives can contain plots that include critical thinking and characters that employ it. Viewers or readers observe such plots and characters and, according to social cognitive theory (Bandura, 2001), recognize success or failure and either perceive it as a useful or not useful option for actions. An action (in this case, critical thinking) is perceived as successful, if the characters reach their goals or are rewarded by other characters. In this case, viewers or readers store this way of thinking as a viable option

for action, and may apply it when the situation is appropriate. Narrative persuasion theories predict that deep immersion in the form of narrative engagement or transportation will intensify the processing of the narrative and its messages (Bilandzic and Busselle, 2013; Green et al., 2019). Identifying with the characters, that is, taking their perspective, understanding their goals and motivations and hoping for a good outcome also usually support effects of narratives (Cohen, 2001).

The call for critical thinking in a modern media narrative may take very different forms—practically all representational activities of critical thinking suggested by Moon (2008) are possible. To explore the scope of such representational activities of critical thinking implied by a narrative, we use data from a pilot study on the recent film “Don’t look up” (McKay, 2021), in whose plot critical thinking is an integral part, and explore what viewers perceive and interpret as the film’s call for action.

Pilot study

The goal of the study is to explore viewer interpretations of a film’s call for action and probe their perception of critical thinking activities that the film implies. We used a film that specifically foregrounds critical thinking related to interrelation of climate change, science, politics, media and society. With this choice, we seek to explore whether the audience also recognizes the critical potential of the film. This is a first analytical step to assure the potential of the new concept “critical thinking” before we turn to investigating critical thinking as an actual effect in follow-up studies.

Study material

As material, we chose the film “Don’t look up” (director: Adam McKay, release: 2021). In this film, a group of astronomers discover a comet that is on collision course and will destroy the Earth within 6 months. Their warnings are first ignored and downplayed, then used as sensationalist fodder for media. The comet was finally slated to be hit and diverted from its course by nuclear weapons, but these plans were changed in the last minute in favor of a much riskier and more speculative plan to fragment and recover the comet in order to exploit its rich contents of rare earths. This plan however fails, and Earth is indeed destroyed. The approaching comet and its deadly force that lies in the future is seen as an allegory to climate change (Doyle, 2022). It is also meant to serve as an allegory to science denial more generally that we have witnessed during the COVID-19 pandemic, as the lead actor Leonardo DiCaprio himself states in a Twitter message (Tassi, 2021). As a satire, the film criticizes the slow and ideologically biased responses to climate change, the lack of mitigation efforts and capitalism ruthlessly extracting financial gain from climate change, as well as the corruption of politics

and media to use or ignore climate change for their purposes (Doyle, 2022; Guenther and Granert, 2022). The film reaches its satirical goals, but runs the risk of alienating the audience by making fun of its very viewers (Little, 2022). The film, turned out to be one of the most successful releases on Netflix (Buxton, 2022).

Procedure and participants

An online survey was conducted from January 25 to February 25, 2022 with German-speaking participants. The short questionnaire contained questions about the film experience and demographics. For the purpose of this article, we will analyze the answers to the open-ended question “*What do you think the film wants you to do? The film wants me to...*”.

The sample consisted of participants who had seen the Netflix movie ‘Don’t look up’. They were recruited in a convenience sample through mailing lists and social media. With this procedure $n = 78$ participants were recruited; two were deleted from the data set due to missing responses. The final data set contained 76 participants (67% female, age $M = 25.21$, $SD = 5.41$, range 18 to 42 years).

Analysis of the open-ended answers

We used the collection of activities of critical thinking by Moon (2008) to analyze the open-ended answers with a simple form of qualitative thematic analysis (Braun and Clarke, 2021).

The first step was to identify relevant cases in which critical thinking was mentioned. For this step, we used a list of terms describing critical thinking by Moon (2008, p. 30) that contains the terms “thinking”, “appraisal”, “evaluation”, “reflection”, “understanding”, “analysis”, and “awareness” (excluding the terms “management”, “care”, “review”, and “appreciation” because they are more geared toward an educational and professional context than the informal media context). In addition, we added the terms “questioning”, “drawing conclusions” and “forming opinions”. If one or more of these activities (whether as nouns or verbs, or as synonymous variations) were mentioned in the respondents’ answers, we coded critical thinking to be present in the answer.

The second step was to explore the material for activities of critical thinking (Moon, 2008) that respondents mentioned as the call for action of the film: (1) Reviewing someone else’s argument, (2) evaluating an object, (3) developing an argument, (4) thinking critically about the self, (5) reviewing an incident, event or fictitious scenario, (6) engaging in constructive responses to the arguments of others and (7) habitually engaging with the world. Below we describe how

these activities are present in the answers and give examples for each.

Results

The first step showed that almost two thirds of our respondents thought that the film wanted them to critically reflect (62%), with one or more of the key words appearing in the answers. While this is certainly not equivalent to an actual effect of a media narrative to stimulate people to reflect, it does demonstrate that the majority of viewers understood and recognized the appellative function of the film that the producers and actors themselves set out to fulfill. This is not as trivial as it seems, because an allegorical film about climate change could also be perceived as a request to simply engage more in climate protection. Instead, it was critical thinking that was foregrounded by the answers—with very different targets. Often, no direct object of thinking was mentioned, for example, one person (female, 37 years) stated: “More thinking and questioning!” or another female (39 years): “Scrutinize more.” In other statements, politics was singled out as the target of critical thinking; for example, a 28 years old woman wrote: “Reflect the behavior of politics and humanity.” In addition to politics, media were often mentioned as a target of critical thinking: “Be more critical of external influences (media, sources of funding for political parties) on political decisions” (male, 30 years) or “Questioning information from the media and, that I am active myself and that together we can achieve a lot” (female, 20 years). Finally, specific topics were also mentioned—especially the two science topics that the film can metaphorically represent: Climate change and the COVID-19 pandemic: A 23-year-old female participant, for example, wrote: “Thinking about which values, things etc. are really important and that people finally believe the scientists and become more active, for example, regarding climate protection, but also COVID”.

As for the second step, we were able to find instances of all seven of *Moon* (2008) activities of critical thinking in the answers.

Reviewing someone else’s argument

Respondents refer to the activity of scrutinizing arguments by others in the actual world, for example, arguments put forward by the media, politicians or the industry. For example, a 23-year-old woman stated: “Engage more with the issue of climate change (with the scientific opinions and sources) and question political campaigns and opinions more closely”, or “I can look at and understand both sides of future-relevant topics. Especially when it comes to global warming,

environmentalists are very humiliated compared to politicians and tech giants” (male, 26 years). In a more generalized version, we can find: “I myself also deal with opinions that do not necessarily correspond to my view” (male, 21 years).

Evaluation of an object

Respondents mention that they felt the call to critically make evaluative judgments of an object, a situation or positions, for example, to think about climate change. A typical example here is feeling prompted to think about climate change in general: “To reflect on climate change and my/our attitude toward it, to exchange ideas with other people and to become aware of the increasingly accelerating effects of climate change and that we must do something about it.” (female, 27 years). Other objects include the political system (“question the existing system with regard to the balance of power and think about its future viability”, female, 27 years) or media (“Deal more critically with media content”, female, 26 years).

Developing an argument

Here, participants stated that they felt compelled to find a position of their own: “Check news sources, make up your own mind, and listen to science” (female, 25 years) or “Form my own opinion” (female, 30 years).

Thinking critically about the self

Respondents perceive that the film invites them to critically assess their own behaviors and to think about ways to contribute to problems like climate change. For example, a 23-year-old woman stated: “Getting out of my comfort zone”. Another example is: “Think more about how my consumer behavior in general affects the development of the world” (male, 18 years), and, similarly: “Compare my behavior in the current situation with that of the film and reflect on it” (female, 23 years), or: “Become aware of my use of social networks and their filter bubbles, as well as not jumping from headline to headline and losing sight of important issues” (male, 22 years).

Reviewing an incident, event or fictitious scenario

This category was rarely addressed with a specific event in focus, probably partly due to the very particular way of phrasing the question that asked for generalizations rather than specific

events. Responses that went into this direction were focused on more general real-world events or situations, for example: “think about the vaccination and don’t deny Corona. That I think about climate change and the scientists who report on it” (male, 21 years).

Engaging in constructive responses to the arguments of others

As there was no actual engagement with others in the survey, this category was mostly realized as a prompt to look for and work with one’s own evidence, and not rely on someone else’s interpretation (which can be considered as preparatory for a constructive response to the arguments of others). Examples include “Don’t take everything for granted without questioning it yourself” (male, 39 years) or “Maybe even start learning more about scientific things from scientifically proven sources” (female, 22 years).

Habitually engaging with the world

Respondents generalized the call for a critical stance to other topics or even without a restriction, making critical thinking applicable to life in general, for instance, “Critically question and get my own picture of the events based on reputable sources” (female, 20 years), “get thoughtful” (male, 32 years) and “question things more and think about them” (female, 22 years).

Implications of critical thinking as a mind-set effect

In this article, we proposed a new facet of eudaimonic entertainment that is grounded in critical thinking and the tradition of Enlightenment literature. Critical thinking as a mind-set effect of media narratives describes a consequence of media use that entails a change in how people approach problems, beliefs and information in general: with an open, inquisitive and critical mind that seeks to understand and form opinions autonomously. Steven Pinker, a proponent of “new Enlightenment” that counters political or ideological forces seeking to regress societies behind modern achievements, sees Enlightenment as firmly built on reason as a basic principle of life and insight into the world, keeping us from delusions like faith, dogma, authority, mysticism, superstition (Pinker, 2018, p. 8ff). Critical thinking is one expression of such reason, which emphasizes that we need to break the habits of thought and reflect our own thought processes as well as the ways in which we come to our conclusions about the world.

We presented results from a pilot study on the film “Don’t look up” (McKay, 2021) and analyzed open-ended responses to

the question: “*What do you think the film wants you to do?*” The analysis showed that almost two thirds of participants reported one or more activities of critical thinking to be the perceived call to action of the film. We could also identify many variations of critical thinking in their responses, ranging from a simple evaluation of an object to more complex thinking critically about the self.

The study has certainly some limitations in its ability to provide insight into critical thinking stimulated by media narratives. First, it only reflects people’s *perceptions* of the call to action provided by the film, *not actual effects* of the film. While it was useful to determine the scope of people’s perceptions of what media narratives may imply about critical thinking, the results should not be confused with critical thinking that actually occurs after exposure. Second, the sample size was rather small, due to the recruitment of viewers of the film rather than a general population sample. While sample size was sufficient to inform the qualitative analysis about possible variations in critical thinking, it was not sufficient to conduct a quantification of the activities of critical thinking in the aftermath of a film. Third, looking at one film rather than a range of films has always its problems, as idiosyncrasies of one narrative are not corrected or compensated by other narratives. “Don’t look up” was criticized, for example, for its limited or even inaccurate representations of the role of media and a devaluation of the role of celebrity scientists (Fahy, 2022). Here, it would be useful to also investigate films that do not have this shortcoming (but possibly others). Looking at several instances of narratives can provide a more complete picture and make the insight less dependent on the idiosyncrasies of one product.

While the pilot study cannot serve as a direct test or a definitive answer to narrative influence on critical thinking, we can conclude that there is some promising theoretical and empirical uncharted territory to be mapped out and explored in further research. Nonetheless, based in the study as well as our theoretical considerations on critical thinking and the Enlightenment, we are able to offer first reflections on how the new concept of critical thinking as a mind-set effect fits in and enriches current research on narrative effects. We will elaborate on three aspects: 1) Properties of the narrative conducive to stimulate critical thinking as a mind-set effect, 2) implications for theories of narrative effects and 3) the struggle with the anarchy of fiction.

Properties of the narrative conducive to stimulate critical thinking as a mind-set effect

In research on eudaimonic media effects, a focal point of discussion is the question what properties media content must have in order to stimulate eudaimonic effects. Raney et al. (2019)

suggest that no fixed set of properties exists, and that it depends on the reader or viewer whether meaningful insight can be extracted: “Without a doubt, some media messages are more likely to promote reflection on the human condition and life’s meaning than are others. But, even the most light-hearted fare often includes meaningful content—such as depictions of love, hope, or kindness—which can trigger eudaimonic reactions and appreciation” (p. 260). It seems, however, that eudaimonic experiences are connected to a higher level of intensive processing, as dual processing models of entertainment suggest (Bartsch and Schneider, 2014; Lewis et al., 2014). Consistent with that, a study by Bartsch and Hartmann (2017) showed that cognitive and affective challenges in media content increased judgments of appreciation of a movie. A study by Ott et al. (2021) demonstrated that films that were described with eudaimonic attributes in user-generated lists on a movie site (such as poignant, moving, or meaningful) increase eudaimonic outcomes such as making sense of difficulties or accepting the human condition.

For critical thinking, we assume that complexity or challenge is beneficial, and that no manifest simple message can relieve the viewer of the burden to do the necessary interpretational work and draw conclusions. We suggest that complexity or challenge may consist of three aspects of the narrative text.

First, “meaningful” narratives that address the human condition, purpose in life, moral virtue or existential concerns (Oliver et al., 2018) should facilitate critical thinking.

For example, “Don’t look up” is based on the deadly threat of the comet. Topics like the struggle for survival or fear of impending death, in principle, concerns all audience members and can create involvement that increases systematic, effortful processing (Petty and Cacioppo, 1986), which is known to be related to eudaimonic media experiences (Bartsch and Schneider, 2014; Lewis et al., 2014). We assume that such topics also facilitate critical thinking as a mind-set effect.

Second, another challenge the narrative can offer is a plot that is an *abstraction*, *metaphor* or *allegory* of the actual issue. Viewers or readers need to make the connection to the real-world issue and the real-world people themselves, and when they do, have solved a cognitive task that leaves a satisfactory feeling. In “Don’t look up”, the comet is considered a metaphor for climate change. Of course, abstraction also entails that a certain ambiguity about the film’s meaning and reference to the actual world remains—but it is this ambiguity that allows viewers or readers to complete their creative task of decoding the metaphor.

Third, the narrative benefits from a distanced perspective, for example that of the stranger, of the child, a naïve person or the outsider. Observing events from a distance allows to dishabituate audience members from their usual perceptions and customary thinking and see the issue from an outside perspective. In “Don’t look up”, several such distanced perspectives are offered, for example, the perspective of the

group of scientists, especially the female lead role of astronomy doctoral student Kate Dibiasky who discovers the comet and who—in contrast to her professor Randall Mindy—does let herself be corrupted by the political and media machinery. This makes her an outside perspective, but also the fact that she “cannot be easily transformed into a commodity that she is sidelined as a scientific voice. She comes from the wrong university and the wrong gender and does not fit into the limited frame that women scientists must squish themselves into for public consumption” (Chambers, 2022, p. 4). Another character that is suitable for this kind of perspective is the minor character of Yule who becomes a friend of Kate Dibiasky: “Yule is also an outsider in the film — he is outside of society (shoplifting and skateboarding out the back of an abandoned burger joint) and outside of science. This outsider role allows Yule to be the only character who appears to be reasonably persuadable or skeptical of the science, religion and those in power all at once, and potentially gives the audience a window to reflect on the messages of the film” (Little, 2022, p. 4f).

Fourth, including accurate facts about the issue at hand may also support critical thinking as it prompts the viewer or reader to take the narrative seriously and not to dismiss the issue itself because the narrative lacks credibility in putting forward an issue. Some fictions go as far as mixing narrative and paradigmatic modes (Bruner, 1986); an example of this is “State of Fear” that we mentioned earlier which combines a fictional plot and fictional characters with extensive, information-ridden dialogues and graphs plotting the changes in global temperature. There is some appeal to this strategy, but it may also backfire by adding an overtly persuasive and educational component into an otherwise entertaining text.

Implications for theories of narrative effects

We will now explore how critical thinking as a new type of narrative effect is compatible with existing theories of narrative effects and how it can expand them.

Social cognitive theory

Social cognitive theory predicts that observing a model character having success with a certain behavior leads to memorizing the behavioral option and eventually to an application in an appropriate situation (Bandura, 2001). This is certainly compatible as audience members can observe characters engaging in critical thinking and learn from the encounter. The same rules from social cognitive theory apply: When a character is successful through critical thinking, the viewer’s or reader’s own propensity to think critically should be increased. The theory encounters a boundary when the ultimate outcome for the critical characters is negative. For

example, in the film “Don’t look up”, all those who have been involved in efforts to save the Earth, are killed in the end.

Counterfactual thinking

The critical thinkers in “Don’t look up” seem to be more akin to tragic heroes who fail in the face of stark adversity—they die trying to save the Earth, which makes their effort heroic and not futile. Still, the straightforward argument of social cognitive theory of observation-memory-action cannot explain neither positive evaluations of the heroic characters nor potential effects. For this type of story with a tragic ending, counterfactual thinking as an effect mechanism seems more appropriate: In this approach, an unfavorable (often tragic, deadly) ending for a character in a story triggers counterfactual thoughts about how the ending could have been prevented (Tal-Or et al., 2004). Persuasion then hinges on the extent to which people engage in counterfactual thinking, that is, generate thoughts about different possible events and outcomes of the story. This constructive process is quite compatible with critical thinking, where readers or viewers necessarily need to contribute extended cognitive efforts to the narrative experience.

Narrative effects theories

Apart from social cognitive theory and counterfactual thinking, narrative effects theories are also potentially relevant for critical thinking as an outcome of narrative exposure. First, critical thinking in a sense presents a contradiction to the main mechanism of narrative persuasion, counterarguing. Second, we suggest that critical thinking both as a mechanism and as an effect in its own right may be used to expand narrative effects theories.

The first point concerns the main mechanism of narrative persuasion put forward by current theories such as the transportation imagery model (Green and Brock, 2000; 2002) or the model of narrative comprehension and engagement (Busselle and Bilandzic, 2008): counterarguing. It is defined as generating thoughts or statements that refute an advocated position, for example, by questioning the validity of arguments, pointing out negative aspects of the position or expressing negative feelings about it (Cacioppo, 1979). Narrative impact is enabled and supported by reduced levels of counterarguing against the narrative’s message (Green and Brock, 2002; Bilandzic and Busselle, 2013; Green et al., 2019): As narrative engagement or transportation focuses all mental resources on the plot and the characters, no capacity is left to be critical with the story or its assertions. In an engaged mode, readers or viewers experience a narrative in an intensive, vivid way, and at the same time, are uncritical with it (reduced counterarguing); this strengthens the effects of a narrative.

Narrative effects theories relying on a suppression of counterarguing as a main mechanism are somewhat at odds with the notion of critical thinking stimulated by a narrative. Critical thinking implies that audience members are encouraged to question and challenge issues—and this does not exclude the media narrative itself. Following the basic logic of narrative persuasion theories, a call for critical scrutiny in the narrative may undermine the persuasive effort if people end up generating critical thoughts about the narrative itself. In a way, critical thinking is exactly what needs to be *prevented* in our current models of narrative impact.

The second issue we mentioned above—that critical thinking can be used to expand narrative effects theories—builds on these limitations of counterarguing. We suggest that counterarguing is still a tenable mechanism of narrative impact—albeit with a limited scope. It is suitable for goal-oriented strategic communication, e.g., on health (de Graaf et al., 2016), advertisement (Chang, 2012), pro-social attitudes (Paravati et al., 2022). In these cases, the message is clear: improve your health, buy the product, help others. When the message is unambiguous, arguing against or being critical about the message will weaken the intended effects, whereas an uncritical acceptance of the message will strengthen it. This may be considered a limitation of counterarguing as a mechanism: It needs to be evident what the message is. When the message is complex, depends on perspective or, like moral dilemmas, has neither a “correct” solution nor an advocated position, then counterarguing has no definite target and loses influence as a mechanism. In such cases, critical thinking may be a more likely outcome than persuasion: The narrative makes people aware of a problem and leads them to question their own habitual thinking. So, one expansion that critical thinking may offer to narrative persuasion theories is to draw attention to effects that do not require a suppression of counterarguing.

Furthermore, persuasion—shaping, reinforcing or changing responses through messages (Miller, 2013)—is not everything that narratives can do. We have suggested that critical thinking may be an effect in its own right, which for some issues may be more plausible or desirable than persuasion—even in strategic communication: For example, an entertainment education narrative may promote gender equality in the workplace; obviously, changing deeply engrained, possibly unconscious beliefs and behaviors does not happen after one exposure. Inducing critical thinking rather than aiming at uncritical acceptance of the gender equality message may prolong internal preoccupation with the message as it is pondered again and again. The absence of counterarguing could conclude the matter right after exposure and prevent internal cognitive disputes from the outset. A parallel to this idea is the central route in the elaboration likelihood model (Petty and Cacioppo, 1986), where attitudes that are formed under high-involvement conditions turn out stronger and more resistant to future change.

Thus, the second expansion of narrative effects theories is that the outcome is not accepting the advocated position, but a critical mind-set that people will carry outside of the exposure situation. The critical mind-set applies to all kinds of topics and may alter the way in which people process new information and make decisions. A similar idea was expressed and empirically supported by Xu and Wyer (2012) who activated a counterarguing mind-set in participants and found that subsequent exposure to ads was less effective. The sequence we propose is reversed: A critical mind-set is induced by media narratives and effective in any situation afterwards.

A third expansion relates to the motivation to think critically. As stated above, narrative effects theories assume that being intensively immersed in a narrative reduces the amount of counterarguing. The reason is that people have neither the mental capacity to counterargue, because they are focused on processing the narrative, nor the motivation, because it interferes with their enjoyment of the narrative (Green and Brock, 2002). Our notion of critical thinking as part of the eudaimonic entertainment experience however suggests that the media narrative provides the trigger to think critically. This is an inconsistency, as far as simple persuasion and hedonic enjoyment are concerned. When critical thinking is the outcome, it is in line with what we know about eudaimonic entertainment experiences. As Bartsch et al. (2014) found, watching a moving short film and feeling moved by it (defined as an affective state featuring negative valence, moderate arousal, mixed affect) also evoked more reflective thoughts that in turn explained a more positive experience of the film. Mixed affect—that is, a combination of positive and negative emotions (Slater et al., 2019)—may also be a major motivator to think critically.

Retrospective imaginative involvement

An additional issue is the time frame of effects and mechanisms of effects after one exposure or in between exposures. So far, narrative persuasion research has mostly focused in either one-time exposure effects, long-term effects of single exposures (after a week, or a month) or cumulative multiple-exposure effects. Recently, research has started to investigate cognitive effects that are stimulated by one exposure, but are carried on in an internal process by the viewer or reader: Retrospective imaginative involvement expresses the mental engagement with a story world and story characters imaginatively after exposure to a story (Slater et al., 2017; Sethi et al., 2022; Sherrick et al., 2022). This may include imagined interactions or identification with the characters, connections to one's own life or counterfactual thinking about the story (Slater et al., 2017). This logic can be transferred to critical thinking as a mind-set with less focus on interactions and identification and more on cognitive reflection of the narrative.

The struggle with the anarchy of fiction

Fiction does not have the task to represent truth or reality. As a format, it builds on a tacit agreement between the narrative's author and the audience that fiction tells a story that has not actually happened, but that also does not pretend to be the truth and that is certainly not a lie—because what “fiction” means is commonly (and tacitly) known among the audience and not considered a problem (Busselle and Bilandzic, 2008). Fiction is not expected to comply with facts and relate the truth; often real-world situations or processes diverge from the actual circumstances in the service of a good story. This is one aspect of what we term the “anarchy of fiction”—divergent it is, but legitimately divergent.

Another aspect of the anarchy of fiction is that fiction is not obliged to provide a unified, clear message. The requirement is to tell a good story, and not to have a mission. Thus, fictional narratives more often than not have ambiguous messages. This is especially true for satirical formats where irony, exaggeration and caricature leave it up to the viewer to decide what exactly is criticized and what exactly is supported by the narrative (Little, 2022). Again, clear targets of the satire help achieve effects in the intended direction. For example, Brewer and McKnight (2015) found that satirical television news programs about climate change increased the certainty that global warming exists. But for fictional satirical films, the message is often more complicated.

The third aspect of the anarchy of fiction concerns the reader or viewer. If the message in the narrative is ambiguous, the message that viewers take away is similarly anarchic. The degrees of freedom in readings are considerable—we have seen how many different calls for action people have mentioned in our pilot study. Still, ambiguous messages are not *per se* detrimental for an effect on critical thinking, because simpler message and simpler recognition of the message also means less interesting plots, characters and food for critical thought.

The fourth aspect of the anarchy of fiction deals with the legitimacy of critical thought. One major problem of considering fiction as a vehicle for critical thought is the demarcation of substantial, legitimate critical thought from unfounded, illegitimate, pseudocritical thought. This is especially relevant as critical thinking and “thinking for yourself” has to some extent been hijacked by conspiracy narratives. The logic of the conspiracy “is to question everything the ‘establishment’—be it government or scientists—says or does, even on the most hypothetical and speculative grounds” (Goertzel, 2010, p. 494). It is exactly the call *not* to rely on authority that connects legitimate critical thinking with conspiratorial critical thinking. Hübl (2020) contends that conspiracies mimic scientific thinking, with its attacks on the “standard view”, offering a simple and original explanation, and cultivating a skeptical stance, all while detached from actual and solid evidence, only representing a “dummy or superficial imitation of real science” (p. 1). A good

example for such hijacking of critical/scientific thinking by conspiracy mentality is the novel “State of Fear” that we already used as an example. In this novel, critical thinking and criminal investigation is directed at an eco-terrorist group that seeks to attract attention to climate change by organizing terrorist attacks supposed to look like climate change effects. A group of international law enforcement agents and a lawyer investigate this conspiracy and, along the way, have critical and inquisitive discussions about the existence and scope of climate change. Here, the conspiracy theorists offer the dominant narrative perspective and it is them who apply critical thinking against the mainstream.

Conclusion

Critical thinking as a mind-set effect is a promising addition to eudaimonic media effects as well as narrative effects. It is certainly desirable to create a more emancipated, enlightened stance in audiences, but a limitation should not go unmentioned. When the topic is science—as in climate change, or the COVID-19 pandemic, just relying on one’s own critical thinking may not be sufficient. Even with the best of critical faculty, and the most universal of knowledge in natural sciences, it is next to impossible for non-scientists to look at evidence themselves and decide on a justified position, if not for a lack in specialized expertise and access to the research, then for a lack in time. In this situation, trust in science and scientists become key to seeking and evaluating information as well as judgments on science (Hendriks et al., 2016). This complicates the matter because scientific authorities also belong to the category of authorities—that, in an enlightened perspective, we do not want to believe blindly. So, are scientific authorities an exception—because they belong to the epistemologically privileged group? In this case, we would need to separate good and bad critical thinking, which—needless to say—is a shaky enterprise.

In this article, we have provided a theoretical elaboration of the concept of critical thinking, connected it to eudaimonic media effects as well as narrative persuasion. We have also exemplified what critical thinking might look like with a pilot study on the film “Don’t look up”. As a black comedy, the film attracted a large audience, one of the largest featured in Netflix (Buxton, 2022). This may be due to the expectation connected to the genre comedy, which promises an enjoyable and entertaining experience. Nonetheless, the film has a deeper, metaphorical meaning and has a mission to raise awareness about climate change. This double layer, enjoyable comedy plus deeper meaning, has been noted in research on eudaimonic media effects, where, “enjoyment and appreciation have not been conceptualized as mutually exclusive or as opposite ends of a continuum, but rather as orthogonal outcomes of entertainment reception.” (Raney et al., 2019, p. 259). In this case, we can speculate that the motivation to watch the film

was hedonic, and the effect was eudaimonic. This, of course, is a good option if viewers can be expected to be reluctant to deal with a topic or if a topic is unappealing. But ultimately, the active part of the viewer cannot be replaced—the viewer needs to extract meaning from an enjoyable experience, and this is certainly effortful and possibly painful. As Moon (2008) concludes for critical thinking in education: “The nature of thinking of an individual is under the control of that individual and one person cannot make another think critically” (p. 131). Similarly, media narratives cannot be regarded as a magic potion to force someone think critically. However, narratives have the ultimate advantage over other formats in that they do not put forward a persuasive intent or patronize their audience. In the end, the narrative format—accompanying audiences without authority and patronage—seems like an adequate vehicle for Enlightenment’s goals to release citizens into autonomy and self-reliance.

Data availability statement

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

Ethics statement

Ethical review and approval was not required for the study on human participants in accordance with the local legislation and institutional requirements. The patients/participants provided their written informed consent to participate in this study.

Author contributions

HB developed the theoretical approach and wrote the first draft of the manuscript. JNB carried out data collection and contributed sections of the manuscript. Both authors contributed to the conception and design of the study, to the qualitative analysis, to manuscript revision, read, and approved the submitted version.

Conflict of interest

The authors declare that the research was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.

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References

- Abbott, H. P. (2008). *The Cambridge Introduction to Narrative*. Cambridge: Cambridge University Press. doi: 10.1017/CBO9780511816932
- Bandura, A. (2001). Social cognitive theory of mass communication. *Media Psychol.* 3, 265–299. doi: 10.1207/S1532785XMEP0303_03
- Bartsch, A., and Hartmann, T. (2017). The role of cognitive and affective challenge in entertainment experience. *Commun. Res.* 44, 29–53. doi: 10.1177/0093650214565921
- Bartsch, A., Kalch, A., and Oliver, M. B. (2014). Moved to think: The role of emotional media experiences in stimulating reflective thoughts. *J. Media Psychol.* 26, 125–140. doi: 10.1027/1864-1105/a000118
- Bartsch, A., and Oliver, M. B. (2017). “Appreciation of meaningful entertainment experiences and eudaimonic well-being,” in *The Routledge handbook of media use and well-being: International perspectives on theory and research on positive media effects*, Reinecke, L., and Oliver, M. B. (eds). (Routledge: Taylor & Francis Group) p. 80–92.
- Bartsch, A., and Schneider, F. M. (2014). Entertainment and politics revisited: how non-escapist forms of entertainment can stimulate political interest and information seeking. *J. Commun.* 64, 369–396. doi: 10.1111/jcom.12095
- Bilandzic, H., and Busselle, R. W. (2013). “Narrative persuasion,” in *The Sage handbook of persuasion. Developments in theory and practice*, Dillard, J. P. and Shen, L. (Los Angeles, London: Sage) p. 200–219. doi: 10.4135/9781452218410.n13
- Boyd, B. (2009). *On the origin of stories. Evolution, Cognition, and Fiction*. Cambridge, MA: Harvard University Press. doi: 10.4159/9780674053595
- Braddock, K., and Dillard, J. P. (2016). Meta-analytic evidence for the persuasive effect of narratives on beliefs, attitudes, intentions, and behaviors. *Commun. Monogr.* 83, 446–467. doi: 10.1080/03637751.2015.1128555
- Braun, V., and Clarke, V. (2021). *Thematic Analysis. A Practical Guide*. Sage.
- Brewer, P. R., and McKnight, J. (2015). Climate as comedy: the effects of satirical television news on climate change perceptions. *Sci. Commun.* 37, 635–657. doi: 10.1177/1075547015597911
- Brown, K., and Rutter, L. (2008). *Critical Thinking for Social Work*. Exeter: Learning Matters.
- Bruner, J. (1986). *Actual Minds, Possible Worlds*. Cambridge, MA: Harvard University Press. doi: 10.4159/9780674029019
- Busselle, R. W., and Bilandzic, H. (2008). Fictionality and perceived realism in experiencing stories: a model of narrative comprehension and engagement. *Commun. Theory*. 18, 255–280. doi: 10.1111/j.1468-2885.2008.00322.x
- Busselle, R. W., and Van den Bulck, J. (2019). “Cultivation theory, media, stories, processes, and reality,” in *Media Effects. Advances in Theory and Research*, Oliver, M. B., Raney, A. A. and Bryant, J. (New York: Routledge) p. 69–82. doi: 10.4324/9780429491146-5
- Buxton, A. (2022). ‘Don’t Look Up’ Officially Crowned Netflix’s Second Most Watched Film Ever. *Green queen*. Available online at: <https://www.greenqueen.com/hk/dont-look-up-netflix-film/~1.7.22>.
- Cacioppo, J. T. (1979). Effects of exogenous changes in heart-rate on facilitation of thought and resistance to persuasion. *J. Pers. Soc. Psychol.* 37, 489–498. doi: 10.1037/0022-3514.37.4.489
- Chambers, A. C. (2022). ‘The handsome astronomer and the yelling lady’: representing scientists and expertise in Don’t Look Up. *J. Sci. Commun.* 21. doi: 10.22323/2.21050304
- Chang, C. (2012). “Narrative ads and narrative processing,” in *Advertising Theory*, Thorson, E., and Rodgers, S. (New York: Routledge) p. 241–254.
- Cohen, J. (2001). Defining identification: a theoretical look at the identification of audiences with media characters. *Mass Commun. Soc.* 4, 245–264. doi: 10.1207/S15327825MCS0403_01
- Crichton, M. (2004). *State of Fear*. New York, NY: Harper Collins.
- de Bruyn, F. (2021). “Introduction to 18th century thought,” in *The Cambridge companion to 18th century thought*, de Bruyn, F. (Cambridge, UK: Cambridge University Press) p. 1–13. doi: 10.1017/9781139998383
- de Graaf, A., Sanders, J., and Hoeken, H. (2016). Characteristics of narrative interventions and health effects: a review of the content, form, and context of narratives in health-related narrative persuasion research. *Rev. Commun. Res.* 4, 88–131. doi: 10.12840/issn.2255-4165.2016.04.01.011
- Donoghue, W. (2002). *Enlightenment Fiction in England, France, and America*. Gainesville: University Press of Florida.
- Doyle, J. (2022). Communicating climate change in Don’t Look Up. *J. Sci. Commun.* 21. doi: 10.22323/2.21050302
- Emmerich, R. (2004). *The Day After Tomorrow (Film)*. 20th Century Fox.
- Ennis, R. H. (2015). “Critical thinking: A streamlined conception,” in *The Palgrave Handbook of Critical Thinking in Higher Education*, Davies, M., and Barnett, R. (New York: Palgrave Macmillan US) p. 31–47. doi: 10.1057/9781137378057_2
- Fahy, D. (2022). Caricatures and omissions: representations of the news media in ‘Don’t look up’. *J. Sci. Commun.* 21. doi: 10.22323/2.21050307
- Funtowicz, S. O., and Ravetz, J. R. (1993). “The emergence of post-normal science,” in *Science, Politics and Morality. Scientific Uncertainty and Decision Making*, Schomberg, R. (ed). (Dordrecht: Kluwer Academic Publishers) p. 85–123. doi: 10.1007/978-94-015-8143-1_6
- Gainer, J. (2012). Critical thinking: foundational for digital literacies and democracy. *J. Adolesc. Adult Lit.* 56, 14–17. doi: 10.1002/JAAL.00096
- Goertzel, T. (2010). Conspiracy theories in science. *EMBO Rep.* 11, 493–499. doi: 10.1038/embor.2010.84
- Gottschall, J. (2012). *The Storytelling Animal: How Stories Make Us Human*. New York: Houghton Mifflin.
- Green, M. C., Bilandzic, H., Fitzgerald, K., and Paravati, E. (2019). “Narrative effects,” in *Media Effects. Advances in Theory and Research*, Oliver, M. B., Raney, A. A., and Bryant, J. Fourth (eds) (New York, London: Routledge) p. 130–145. doi: 10.4324/9780429491146-9
- Green, M. C., and Brock, T. C. (2000). The role of transportation in the persuasiveness of public narratives. *J. Pers. Soc. Psychol.* 79, 701–721. doi: 10.1037/0022-3514.79.5.701
- Green, M. C., and Brock, T. C. (2002). “In the mind’s eye. Transportation-imagery model of narrative persuasion,” in *Narrative impact: Social and cognitive foundations*, Green, M. C., Strange, J. J., and Brock, T. C. (eds). (Mahwah, NJ: Lawrence Erlbaum) p. 315–341. doi: 10.4324/9781410606648
- Greenberg, B. S. (1988). “Some uncommon television images and the drench hypothesis,” in *Applied Social Psychology Annual (Vol. 8): Television as a social issue*, ed. S. Oskamp. (Newbury Park, CA: Sage) 88–102.
- Greenberg, J. (2019). “Enlightenment satire: The prose tradition,” in *The Cambridge introduction to satire*, Greenberg, J. (ed). (Cambridge: Cambridge University Press) p. 104–126. doi: 10.1017/9781139343251.005
- Guenther, L., and Granert, L. (2022). Evidence in the eye of the beholder: portrayals of risk and scientific (un)certainly in Don’t look up. *J. Sci. Commun.* 21(5). doi: 10.22323/2.21050303
- Hendriks, F., Kienhues, D., and Bromme, R. (2016). “Trust in science and the science of trust,” in *Trust and communication in a digitized world*, Blöbaum, B. Springer. p. 143–159. doi: 10.1007/978-3-319-28059-2_8
- Hübl, P. (2020). *In search of a master plan. How conspiracy theorists get the scientific method wrong Elephant in the Lab*. Available online at: <https://zenodo.org/record/3964396#YooC7S-230o> (accessed July 15, 2022).
- Huta, V. (2015). “An overview of hedonic and eudaimonic well-being concepts,” in *The Routledge Handbook of Media Use and Well-Being: International Perspectives on Theory and Research on Positive Media Effects*, Reinecke, L., and Oliver, M. B. (New York: Routledge) p. 14–33.
- Huta, V., and Waterman, A. S. (2014). Eudaimonia and its distinction from hedonia: developing a classification and terminology for understanding conceptual and operational definitions. *J. Happiness Stud.* 15, 1425–1456. doi: 10.1007/s10902-013-9485-0

- Hutto, D. D. (2008). *Folk Psychological Narratives: The Socio-Cultural Basis of Understanding Reasons*. Cambridge, MA: Bradford Books. MIT Press. doi: 10.7551/mitpress/7525.001.0001
- Kant, I. (1784/2014). Was ist Aufklärung? [What is enlightenment?] *Berlinische Monatsschrift*, 1784, H. 12, S. 481–494. *Sources of the Western Tradition, Volume I, From ancient times to the Enlightenment*, Perry, M. (ed.) (Wadsworth: Cengage Learning) p. 424–425.
- Knobloch-Westerwick, S. (2006). “Mood management theory: Evidence, and advancements,” in *Psychology of entertainment*, Bryant, J. V. P. (Mahwah: Lawrence Erlbaum Associates) p. 239–254.
- Lewis, R. J., Tamborini, R., and Weber, R. (2014). Testing a dual-process model of media enjoyment and appreciation. *J. Commun.* 64, 397–416. doi: 10.1111/jcom.12101
- Little, H. (2022). The use of satire to communicate science in Don't Look Up. *J. Sci. Commun.* 21. doi: 10.22323/2.21050306
- Mann, K., Gordon, J., and MacLeod, A. (2009). Reflection and reflective practice in health professions education: a systematic review. *Adv. Health Sci. Educ.* 14, 595–621. doi: 10.1007/s10459-007-9090-2
- Mar, R. A., and Oatley, K. (2008). The function of fiction is the abstraction and simulation of social experience. *Perspect. Psychol. Sci.* 3, 173–192. doi: 10.1111/j.1745-6924.2008.00073.x
- McKay, A. (2021). *Don't look up (Film)*. Hyperobject Industries, Bluegrass Films.
- Miller, G. R. (2013). “On being persuaded: Some basic distinctions,” in *The SAGE Handbook of Persuasion: Developments in Theory and Practice*, Dillard, J. P., and Shen, L. (Los Angeles, CA: Sage Publications) p. 70–82. doi: 10.4135/9781452218410.n5
- Moon, J. (2008). *Critical Thinking. An Exploration of Theory and Practice*. London, New York: Routledge.
- Munck, T. (2000). *The Enlightenment: A Comparative Social History, 1721-1794*. London: Arnold.
- Oliver, M. B., and Bartsch, A. (2010). Appreciation as audience response: Exploring entertainment gratifications beyond hedonism. *Hum. Commun. Res.* 36, 53–81. doi: 10.1111/j.1468-2958.2009.01368.x
- Oliver, M. B., and Raney, A. A. (2011). Entertainment as pleasurable and meaningful: identifying hedonic and eudaimonic motivations for entertainment consumption. *J. Commun.* 61, 984–U274. doi: 10.1111/j.1460-2466.2011.01585.x
- Oliver, M. B., Raney, A. A., Slater, M. D., Appel, M., Hartmann, T., Bartsch, A., et al. (2018). Self-transcendent media experiences: taking meaningful media to a higher level. *J. Commun.* 68, 380–389. doi: 10.1093/joc/jqx020
- Ott, J. M., Tan, N. Q. P., and Slater, M. D. (2021). Eudaimonic media in lived experience: Retrospective responses to eudaimonic vs. non-eudaimonic films. *Mass Commun. Soc.* 24, 725–747. doi: 10.1080/15205436.2021.1912774
- Paravati, E., Fitzgerald, K., Green, M. C., McAllister, C., and Moore, M. M. (2022). Narratives to increase prosociality toward refugees. *Int. J. Commun.* 16, 2551–2572.
- Petty, R. E., and Cacioppo, J. T. (1986). *Communication and Persuasion: Central and Peripheral Routes to Attitude Change*. New York: Springer-Verlag. doi: 10.1007/978-1-4612-4964-1
- Pinker, S. (2018). *Enlightenment Now: The Case for Reason, Science, Humanism, and Progress*. Viking.
- Pratkanis, A. R., Greenwald, A. G., Leippe, M. R., and Baumgardner, M. H. (1988). In search of reliable persuasion effects: III. The sleeper effect is dead. Long live the sleeper effect. *J. Pers. Soc. Psychol.* 54, 203–218. doi: 10.1037/0022-3514.54.2.203
- Raney, A. A., Oliver, M. B., and Bartsch, A. (2019). “Eudaimonia as media effect,” in *Media Effects: Advances in Theory and Research*, Oliver, M. B., Raney, A. A., and Bryant, J. (eds) (New York: Routledge) p. 258–274. doi: 10.4324/9780429491146-17
- Ryff, C. D. (2018). “Eudaimonic well-being: Highlights from 25 years of inquiry,” in *Diversity in harmony - Insights from psychology: Proceedings of the 31st International Congress of Psychology*, Shigemasa, S. K., Sato, T., and Matsuzawa, T. (John Wiley & Sons Ltd) p. 375–395. doi: 10.1002/9781119362081.ch20
- Sethi, N., Grady, S. M., Ulusoy, E., Baldwin, J., and Ewoldsen, D. R. (2022). What do we do with narratives after the fact? Exploring dimensions of retrospective imaginative involvement. *Commun. Rep.* 35, 106–119. doi: 10.1080/08934215.2022.2040558
- Sherrick, B., Hoewe, J., and Ewoldsen, D. R. (2022). Using narrative media to satisfy intrinsic needs: connecting parasocial relationships, retrospective imaginative involvement, and self-determination theory. *Psychol. Popular Media.* 11, 266–274. doi: 10.1037/ppm0000358
- Siegel, H. (2010). Critical thinking. *Int. Encyclopedia Edu.* 6, 141–145. doi: 10.1016/B978-0-08-044894-7.00582-0
- Slater, M. D., Ewoldsen, D. R., and Woods, K. W. (2017). Extending conceptualization and measurement of narrative engagement after-the-fact: parasocial relationship and retrospective imaginative involvement. *Media Psychology.* 1–23. doi: 10.1080/15213269.2017.1328313
- Slater, M. D., Oliver, M. B., and Appel, M. (2019). Poignancy and mediated wisdom of experience: narrative impacts on willingness to accept delayed rewards. *Commun. Res.* 46, 333–354. doi: 10.1177/0093650215623838
- Tal-Or, N., Boninger, D. S., Poran, A., and Gleicher, F. (2004). Counterfactual thinking as a mechanism in narrative persuasion. *Hum. Commun. Res.* 30, 301–328. doi: 10.1111/j.1468-2958.2004.tb00734.x
- Tassi, P. (2021). Leonardo DiCaprio explains don't look up's message in case you missed it. Available online at: <https://www.forbes.com/sites/paultassi/2021/12/28/leonardo-dicaprio-explains-dont-look-ups-message-in-case-you-missed-it/?sh=7f0362283cba> (accessed July 1, 2022).
- Tukachinsky, R., and Tokunaga, R. S. (2012). The effects of engagement with entertainment. *Commun. Yearbook* 37, 287–321. doi: 10.1080/23808985.2013.11679153
- van Laer, T., de Ruyter, K., Visconti, L. M., and Wetzels, M. (2014). The extended transportation-imagery model: a meta-analysis of the antecedents and consequences of consumers' narrative transportation. *J. Consum. Res.* 40, 797–817. doi: 10.1086/673383
- Xu, A. J., and Wyer, R. S. (2012). The role of bolstering and counterarguing mind-sets in persuasion. *J. Consum. Res.* 38, 920–932. doi: 10.1086/661112
- Zebregs, S., van den Putte, B., Neijens, P., and de Graaf, A. (2015). The differential impact of statistical and narrative evidence on beliefs, attitude, and intention: a meta-analysis. *Health Commun.* 30, 282–289. doi: 10.1080/10410236.2013.842528