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RESEARCH ARTICLE

Nuclear fear and anxiety: Exercises in future thinking

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Abstract

Anxiety about nuclear war emerged after the 1945 atomic bombings of Japan and has risen and fallen over the following decades. It is grounded in future thinking shaped by narrative form and function in policy discussions and especially in film and television. These media have repeatedly drawn on three basic narrative templates organised around three different endings: destruction, judgement, and renewal; human extinction; and permanent and irreversible societal collapse. Several film and television productions are used to illustrate the internal organisation of these narrative templates and to examine how both nuclear fear and nuclear anxiety are involved.

Keywords: narrative templates; nuclear anxiety; nuclear war films; television; plot

Introduction

The list of existential anxieties facing humankind has grown sharply in recent years. Warnings about climate change, pandemics, and AI have become increasingly insistent and jockey for place in a crowded field of global perils. It is foolhardy to downplay any of these, but in what follows I focus on one danger in particular: nuclear war. It is an issue that can benefit by drawing on memory studies, especially research on 'future thinking' and 'mental time travel' (Tulving, 1985; Merck et al., 2016; Szpunar and Szpunar, 2016; Topcu and Hirst, 2020). Investigations of these topics have explored how mediating systems ranging from neural networks at the individual level to narratives in collective memory are involved in remembering the past and imagining the future.

Fortunately, the world has only two actual past episodes of nuclear warfare, the atomic bombings of Hiroshima and Nagasaki in 1945. But that has not stopped societies from creating what Alisdair MacIntyre (1984) called the 'stock of stories' used to imagine the future, including its moral choices. In the case of nuclear war, these stories draw heavily on fictional writing, film, and television. What follows is an effort to categorise these efforts and their role in anxiety and fear about nuclear war.

For better or worse, it turns out that nuclear weapons[1] provide an ideal focus for the study of existential threats because they appeared on the scene in a sudden, shocking way and provide a clear starting point for understanding how collective anxiety emerged and has

[1] Anxieties over nuclear power are sometimes mixed in with those concerned with nuclear weapons, but I focus primarily on the latter in what follows.

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changed over the years. In *Everything Must Go: The Stories We Tell Ourselves about the End of the World* Dorian Linskey (2024) covers a panoply of existential threats, but he notes that the atomic bomb 'was the world-changer, the mind-filler, the paramount fact'. Only in the early 21st century with the recognition of the climate crisis 'did another single menace achieve such an imperial primacy of the catastrophic imagination' (18).

As with existential threats in general, imagining nuclear war involves 'future thinking' rather than focusing solely on the past. In fact, in this case remembering the past can provide dangerously misguided lessons for acting in the present and future. Of course, the world does have some experience from the past on which to draw, namely the atomic bombings of Japan. However ghastly those events were, they were but a small demonstration of the destruction that an all-out nuclear war would bring, so imagining nuclear war has had to rely on imagining the future, usually accompanied by anxiety, which is inherently future-oriented (Batiashvili, 2024).

The term 'nuclear anxiety'[2] is widely employed in public discourse and research and in self-help publications (Newcomb, 1986; Riad et al., 2023). Measures of this anxiety show it rising and falling over the decades (Rabow et al., 1990; de Vise, 2022). It emerged with the bombings of Hiroshima and Nagasaki in 1945 and has resurfaced during various international crises. It spiked with the Cuban Missile Crisis in 1962 and then reached a new peak in the 1980s with the deployment of intermediate-range ballistic missiles in Europe. During some periods nuclear anxiety has remained relatively low, but it was reawakened with the 2022 Russian invasion of Ukraine and Vladimir Putin's nuclear sabre rattling.

Alex Orlando[3] reports that the Russian invasion of Ukraine was followed by a major spike in searches for the term 'nuclear war', and another spike came when Vladimir Putin put Russian nuclear forces on high alert shortly thereafter. Similarly, the website NUKEMAP, which shows how much destruction nuclear weapons would create in particular locations, soared after the Russian invasion to 20 times the site's normal traffic, resulting in multiple crashes. These numbers decreased after the invasion, but their sudden spike suggests that nuclear anxiety is an underlying concern even if it is not in the headlines.

Low levels of nuclear anxiety have actually been an ongoing concern for groups dedicated to reducing or eliminating nuclear weapons. For them, some level of anxiety about nuclear weapons is required and may even need to be *increased* to mobilise public opinion for their cause. For example, the *Bulletin of Atomic Scientists*[4] has sought to maintain a productive level of nuclear anxiety in its efforts to reduce weapons of mass destruction. Founded in 1945 by Albert Einstein and scientists of the Manhattan Project who built the first atomic bombs, this organisation is best known for it 'Doomsday Clock,' which shows the time remaining before a nuclear Armageddon is likely to occur. In 1947, the minute hand of the clock was set at 7 minutes to midnight, and it moved closer to midnight over the decades with events such as the explosion of the first Soviet atomic bomb in 1949, the Cuban Missile Crisis in 1962, and the 2022 Russian invasion of Ukraine. The clock has occasionally moved backward as well, but it currently is set at under 2 minutes to midnight, which signifies the potential end of human existence on Earth.

Public campaigns of this sort have informed the public about nuclear war over the decades, but other sources, especially film and television[5], have undoubtedly been more

[2] In the 1960s psychiatrist Milton Arnold Dushkin even introduced the term "nucleomituphobia."

[3] https://www.discovermagazine.com/nuclear-anxiety-is-nothing-new-heres-how-to-handle-it-43444.

[4] https://thebulletin.org/.

[5] In this article I do not take up video games, which have become another powerful force in imagining nuclear war.

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important. These media are driven as much by profit motive as political agenda and differ from public campaigns in other respects as well, but a thread that runs throughout both spheres is the drive to control the narrative, which raises the question of what the narrative is that needs to be controlled.

Exploring this issue requires getting inside narratives to unpack their organisation and power. In what follows, I use a broadly sociocultural approach as outlined in the introduction to this project, but much of my argument builds more specifically on narrative analysis and notions of schema from cognitive psychology.

The form and function of narrative tools

Narratives are viewed here as 'cultural tools' that fundamentally shape human discourse and thought. Narratives guide much of what Frederic Bartlett called humans' constant 'effort after meaning' (Bartlett, 1932). They serve as tools that operate at an unconscious and habitual level (Wertsch and Jäggi, 2022), which serves to veil their influence. Of course, active agents are also required in the use of narrative tools, meaning that individual choice and responsibility remain an inherent part of the picture (Wertsch, 1998).

Narratives can be spoken or written or filmic, lengthy and elaborate or short and simple, and conscious or unconscious[6]. The impact of narrative tools can be so great that they appear to 'co-author' what we say and think (Wertsch, 2021). As is the case for cultural tools in general, the narrative tools we use have 'affordances' and 'constraints' (Wertsch, 2002) built into them, and these shape human discourse and thought. Just as a hammer has strong affordances for pounding nails but not for carrying water, the unique formal structure of narrative tools brings particular affordances and constraints to what we say and think. In what follows, I examine the power of a few schematic narratives to shape popular films and a television about nuclear war.

Plot

Scholars ranging from Aristotle (1996) to Russian Formalists (Erlich, 1965; Propp, 1968) to Paul Ricoeur (1984) agree that plot is at the heart of what defines narrative. In his account of tragedy Aristotle argued for 'the primacy of plot' that structures elements in a text and allows one 'to take in the beginning and the end in one view' (39). In developing this argument, he drew on parallels with sculpture, where an object 'can be readily taken in at one view' and argued that plots 'should have a certain length, and this should be such as can readily be held in memory' (14). In today's parlance, this means that narratives are efficient 'cognitive instruments' (Mink, 1978) for human understanding.

Plot is at the heart of 'narrative cognition', which Bruner (1986) distinguished from logico-deductive cognition such as that found in syllogistic or mathematical reasoning. Narrative cognition relies on a 'strange logic' (Brooks, 1984, 23) that grasps together temporally distributed events into an organised whole. The sense of an ending is especially important in this connection because the meaning of events and characters often comes into focus only retrospectively. In this regard, Brooks states, "the end writes the beginning and shapes the middle... [and] everything is transformed by the structuring presence of the end to come" (22).

This strange logic can be seen in historical accounts of events such as the American Civil War, where the full meaning, indeed, the very appellation of the First Battle of Bull Run

[6] The notion of unconscious used here is not tied to repression in the Freudian sense, but to implicit cognitive processes as discussed by Astrid Erll in her account of "the hidden power of implicit memory" (Erll, 2022).

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emerges only when we know the ending of a larger story. Similarly, in detective stories, we often understand the significance of events only when the sleuth gathers everyone in the parlor to reveal how the significance of events in the beginning and middle of the story come into focus only retrospectively.

The narratives used in public discourse reflect institutional and political forces such as those behind propaganda and schooling, to be sure, but the internal structure of plot allows them take on a kind of independent existence and influence in their own right. Jeffrey Alexander (2003) alludes to this in his cultural sociology, which places meaning systems such as narratives at the centre of inquiry. From this perspective, narratives have 'cultural autonomy' (11) that shape mental and social worlds. Building on the structural anthropology of Claude Lévi-Strauss (1974), Alexander argues:

> Because meanings are arbitrary and are generated from within the sign system, they enjoy a certain autonomy from social determination, just as the language of a country cannot be predicted from the knowledge that it is capitalist or socialist, industrial or agrarian. Culture now becomes a structure as objective as any more material social fact. (24)

From this perspective, narrative plot operates as a kind of independent variable 'that possesses a relative autonomy in shaping actions and institutions, providing inputs every bit as vital as more material or instrumental forces' (12).

Two levels of narrative analysis

Claims about the strange logic of plot, narrative cognition, and cultural autonomy apply to stories[7] that include concrete information and can be seen, heard, or otherwise sensed in 'specific narratives'. In addition, these claims apply to underlying narrative codes in the form of 'schematic narrative templates' (Wertsch, 2021) that analysts posit to examine general patterns of narrative use.

An illustration of a specific narrative is a Russian account of the 'Great Patriotic War' (June 22, 1941–May 9, 1945) that reads as:

> The Germans launched a massive, unprovoked attack on the Soviet Union on June 22, 1941. Initially, the Red Army experienced huge losses, but it stopped the Germans at the gates of Moscow in the winter of 1941 and went on to defeat the German invaders at the Battle of Stalingrad in 1943 and the Battle of Kursk later that year. In 1945 it fought its way westward, culminating in the Battle of Berlin and the defeat of Hitler in 1945.

Two criteria make this text qualify as a specific narrative. The first is its overt, surface form in public speeches, history textbooks, visual media, and so forth, and the second is its inclusion of explicit information about actors, dates, and places. This text can be criticised for glossing over 'blank spots' of history (Wertsch, 2008) and being biased in other ways, but it nonetheless is a coherent specific narrative.

In contrast, schematic narrative templates are underlying codes, a sort of 'cultural DNA',[8] that emerges in members of a group from countless exposures to specific narratives. These are schematic in the sense outlined by Ulric Neisser when he wrote that they reflect 'a great number of individual experiences (eg, hearing and telling specific narratives), but they do

[7] "Narrative" and "story" are used interchangeably in this article.

[8] Parallels with biochemical DNA can be helpful, but cultural DNA is *not* a matter of genetic material. Instead, it involves meaning structures that each generation learns through socialization.

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not reflect these experiences separately' (Neisser, 1967, 287). These underlying codes are largely devoid of concrete information and operate at an unconscious level.[9]

In the Russian case, an 'Expulsion-of-Alien-Enemies' narrative template (Wertsch, 2021) shapes specific narratives of events such as the Great Patriotic War, along with other military invasions over the centuries by Mongols, Poles, French, and Germans, as well as invasions of foreign ideas such as socialism and capitalism that are viewed as threats to Russian civilisation.

As an underlying code, this narrative template is not part of overt discussion in Russian schools, media, or commemorations. Instead, it is posited by investigators in an effort to make sense of patterns of thought and discourse. The narrative template in this case can be summarised as:

1. Setting: Russia is existing peacefully and not interfering with others.
2. Trouble appears in the form of an alien enemy that aggressively attacks Russia without provocation.
3. Russia almost loses everything in defeat as it suffers from the enemy's attempts to destroy it as a civilisation.
4. Ending: Through heroism and exceptionalism, and acting alone against all odds, Russia smashes and expels the alien enemy from its territory.

In contrast to specific narratives about events such as the Great Patriotic War of 1941–45, this narrative template does not include information about the location and time of events, and only minimal information about actors. It is what Bruner (1986) labelled a 'cookie-cutter' story that shapes multiple specific narratives about events in the past and present as well as those imagined in future thinking. Future thinking about nuclear war includes imagining multiple specific narratives about concrete scenarios found in film and television, but this imagination is constrained by a few general narrative templates.

Narrative truth

A two-level analysis that includes specific narratives and schematic narrative templates tells us something about narrative form, function, and autonomy, but it does not address another crucial question about narrative tools for imagining events such as nuclear war: Which narratives are true? 'Narrative truth' is a complex and often vexed issue (cf. Mink, 1978), but some such notion is assumed in countless, often heated debates about 'what really happened', which usually include the rejection of opponents' accounts as 'not true'. In reality, human events typically allow for more than one form of what Brooks (1984) calls 'emplotment', or way of laying out settings, actors, motives, and endings to make a coherent story. The selection of one emplotment, as opposed to another, seldom can be made on the basis of objective evidence alone. Instead, some form of selection, usually unconscious, is also involved.

The historian William Cronon (1992) provides an illustration of how this applies to events from the past in his account of two contrasting accounts of the American dust bowl of the 1930s. Both were produced by well-regarded historians, and both were based on carefully examined objective evidence (often drawing on the same sources) and sound reasoning. One plot was about how exceptional American grit and determination overcame the devastation of the Dust Bowl and made it possible for the country to surmount the challenge, and the

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other was about how arrogant American hubris behind efforts to control and dominate nature led to an environmental disaster.

Another example of competing emplotments of major events can be found in accounts of why the United States dropped atomic bombs on Japan in 1945. The standard American account has been that Truman dropped the bombs to end the war with Japan, but in Russia, the standard account is that Truman dropped the bombs to intimidate Stalin against any efforts to expand Soviet power in the post-World War II era (Alperowitz, 1995). There is extensive evidence to support each these emplotments, but the dispute over the narrative truth of what really happened continues to this day. To be sure, objective evidence and rational argument do – and must play a central role in deciding what the most appropriate story of events is, but these alone often cannot determine narrative truth.

Historical scholarship and collective memory differ in how they engage in the struggle over narrative truth (Wertsch, 2021). The former aspires to create objective accounts by using professional standards for rational argumentation and the vetting of evidence, even if that means challenging an established narrative. In contrast, collective memory tends to insist on preserving an established narrative of what happened, even if that means ignoring or distorting evidence.

Public discussion about the past is largely grounded in collective memory, with the result that groups can have great difficulty in convincing opponents to change their views, even in the face of seemingly powerful disconfirming evidence. In such cases, debate can devolve into charges of brainwashing or ignorance (always on the part of others!) and leave all parties frustrated and angry. The tenacity with which individuals hold to their account of what really happened reflects another aspect of narrative tools: their role in identity projects. In addition to being powerful and efficient cognitive instruments, narrative tools used by a collective play a role in an identity project, and this means that challenges to these narratives can be taken as challenges to the group's identity. For example, the Kremlin is extremely sensitive to any questioning of the Expulsion-of-Alien-Enemies narrative template used to justify its 2022 invasion of Ukraine. Any criticism of this narrative template, especially as manifested in the specific narrative of the Great Patriotic War, is met with severe sanctions, including imprisonment.

Meanwhile, competing narratives in places like Ukraine and Georgia depict Russian history as a series of invasions and brutal expansionism at the expense of smaller neighbours. This leaves Russia and many of its neighbours in an intractable 'mnemonic standoff' (Wertsch, 2008). Because narrative templates are involved, the forces at work in such cases are largely unconscious and invisible to those using them. Instead of recognising that their accounts are mediated by their group's narrative tools, parties such as the Kremlin view their utterances as simply reporting a truth that any other person could see as well if they were honest.

Research in social and cognitive psychology on 'my-side bias' (Ross and Sicoly, 1979) can provide insight on these issues. Based on their studies of small groups, Ross and Sicoly report that individuals routinely overclaim responsibility for their contribution to a task. When both members of a couple are asked what percentage of the time they do routine chores such as washing the dishes, for example, the combined estimates invariably exceed 100%. Researchers concerned with national memory have expanded on these claims and reported a similar pattern of groups' overclaiming responsibility for historical events such as World War II. Roediger and his colleagues (Roediger et al., 2019), for example, have documented that members of many nations vastly overstate their contribution to victory in World War II, even when they are forced to take into consideration the contributions of others. These and related findings have been described under headings such as 'national narcissism' (Putnam et al., 2018).

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Taken together, these lines of inquiry suggest that when recounting events from the past, there is a strong tendency at both the individual and collective level to introduce an unconscious, self-interested perspective. There are good reasons to expect this to surface in future thinking as well, including in the imagination of nuclear war.

Narratives templates for imagining nuclear war

Many of the narrative tools used to imagine nuclear war have long-established precursors. This is not surprising, given that collective narratives evolve over centuries and leave well-worn grooves – or ruts in mental habits in their place. The habits in this case are concerned with narratives about defeating or totally destroying enemies in order to defend one's community. In the age of nuclear weapons, however, this general plot can be irrelevant or dangerously misleading because these weapons pose an existential threat to everyone including those trying to defend themselves. Albert Einstein alluded to this in 1946 when he said, 'The unleashed power of the atom has changed everything save our modes of thinking and we thus drift toward unparalleled catastrophe'.[10]

Einstein's observation means that the nuclear age requires new narrative tools to deal with a paradox never before encountered in human history, namely, the fact that we depend on our foes to guarantee our own security, and even existence. Instead of seeing armed conflict as a zero-sum game where one side wins and the other loses, new images have emerged of adversaries standing knee deep in a room of gasoline with each threatening to strike a match. The fact that humans can understand this image and at the same time engage in the massive build-up of nuclear weapons is a source of frustration, anxiety, and despair, and it suggests something deeper at work, something that is unconscious and little understood. It is here that narrative templates, including those that shape film and television come into play.

Imagining nuclear war in film and television

In what follows, I examine several films[11] and one television series from the eight decades of the nuclear age. My analysis gives particular attention to the sense of an ending of the narratives involved. Other analytic foci could be on stories about how nuclear war begins or is narrowly averted, but the sense of an ending is where film and television explore the existential question of what kind of future – or lack thereof – humankind would have after a nuclear war. Using this as a criterion, I searched for ideal types of films that illustrate one or another narrative template.

This procedure yielded three general narrative templates. The first can be labelled 'Death, Judgment, and Renewal'. It has long been part of the Western 'stock of stories' (MacIntyre, 1984) and is often seen as descending from the book of Revelation in the New Testament. In *Everything Must Go*, Linskey (2024) notes that this book is a story about 'destruction, judgement, and renewal [which] means the end of history but not the end of the human experience; transcendence rather than annihilation; something for the righteous to look forward to' (16). Specific narratives in this category end with at least a few survivors to rebuild a new society, thus leaving a glimmer of hope for the future. Two films I consider in this category are 'Panic in Year Zero!' (1962) and 'The Day After' (1983).

[10] *New York Times*, May 25, 1946.

[11] These cases are drawn from a larger corpus of over 30 films that appeared in multiple listings of the best or most important films about nuclear war. I do not include technothrillers and other accounts of imagined events that lead up to, but eventually avoid nuclear war. Instead, I limit myself to films in which nuclear weapons are actually used. All of the films come from the U.S. and UK, but the topic obviously deserves attention in other settings as well.

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Stories about nuclear war in the second category involve 'Extinction of Human Life'. They are about the total extinction of human life on Earth. Linskey traces the origins of this story to the nineteenth century when Lord Byron wrote the poem 'Darkness' (Byron, 1816) and Mary Shelley published her lengthy book *The Last Man* (Shelley, 1826). The latter tells of societal breakdown and eventual extinction of all human beings from a pandemic. These texts by Byron and Shelley were viewed as shocking at the time and met with indignation because instead of recognisable apocalyptic endings about survival and renewal, the stories just stopped and left a void of nothingness. I examine two films in this category: 'On the Beach' (1959) and 'Dr. Strangelove' (1964).

The third narrative template involves 'Irreversible, Permanent, Civilizational Collapse'. Specific films in this category do not conclude with human extinction. Instead, their sense of ending concerns the end of society and human life as we know it. The television series 'Fallout' (2024) provides an illustration of this category.

Narratives about destruction, judgement, and renewal

'Panic in the Year Zero!' is a 1962 black-and-white Hollywood film about how a family copes with a nuclear attack on Los Angeles just as they begin a camping trip in a wilderness area. Hoarders and thieves fleeing the city block their way, leading the father Harry Baldwin (Ray Millan) to use his fists and then guns to obtain fuel and supplies needed for their survival. Baldwin's wife and teenage children, as well as Baldwin himself become increasingly violent as they face life-threatening challenges. When young thugs rape his daughter, for example, Baldwin and his son hunt them down and kill them.

As the family agonises over the violence they are engaging in, Baldwin becomes angry with his wife and children for their failure to recognise that their very survival depends on descending to a level of extreme violence towards others that they could not otherwise have imagined. Eventually, every member of the family participates in violence, including killing outsiders. In explaining the new context in which they are living, the son tells his mother that the family is left on its own and subject no rules or regulations.

In the midst of all this, however, the father holds out hope that social order will return. Sprinkled throughout the film are statements by him such as, 'When civilization gets civilised again, I'll rejoin'. He sees himself and his family as playing a role in this renewal when he tells his wife, 'Someone is going to start putting civilization together again, and I want that someone to be us'. After a few weeks in their rural hideout, the family hears on the radio that social order is returning thanks to authorities who are regaining control as 'Operational Survival' takes effect, relocation centres are established, and the enemy has requested the cessation of hostilities.

Even though many cities around the world have been destroyed by the enemy (the Soviet Union), the notion of renewal in this film remains central to the sense of an ending. In one late scene, Baldwin engages in an outdated mode of thought about the future when he says, 'the war is over, and we have won', leading him and his family to discuss returning to their old hometown. But a friend of the family responded to this sarcastically by saying, 'Well, ding for us', suggesting that old narrative tools about war as a zero-sum game may no longer apply. However, that is a small side note in the context of an otherwise optimistic effort at renewal.

The 1983 television movie 'The Day After' provides another illustration of the narrative template of destruction, judgement, and renewal. It depicts a nuclear war that breaks out after military conflict in Europe spirals into a world-wide conflagration. It tells the story of Lawrence, Kansas and Kansas City, Missouri, which were targeted because of nearby siloes for launching nuclear ballistic missiles against the Soviet Union. The film follows the lives of several characters, especially Dr. Russell Oakes, as he struggles to provide care at a hospital

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inundated with victims of nuclear blast and radiation. Authorities in Washington as well as the local National Guard fail to respond or to re-establish social order in the days and weeks after the nuclear detonations, and in their absence, summary executions of looters, as well as murders of civilians by squatters spread.

Dr. Oakes proves to be an important leader in this setting, but in a matter of days, he and the hospital are overwhelmed as supplies run out, sanitation collapses, and deadly radiation sickness takes a mounting toll. Suffering increasingly serious radiation sickness, he returns to Kansas City, where he finds only a pile of bricks where his home had once been. There he encounters squatters who are also suffering radiation sickness as they try to subsist on a few cans of food. He initially becomes angry and demands that they leave his 'home', but after a few minutes he recognises the futility of his actions and ends up being comforted and fed by a squatter who seems to have only a short time to live. The final scene is a zoom-out of the group as they try to find human comfort and contact in the face of the apocalypse they have experienced.

This very dark plot would seem to leave little room for optimism about the prospects for Kansas, Missouri, or anywhere else in the world, but the film nevertheless holds out the prospect for societal renewal. After a period of losing radio contact with the outside world, the US president comes back on the air and promises that relief and rebuilding efforts are on the way. Hope for renewal also surfaces in another subplot of the film. Among the patients in Dr. Oakes's care is a young woman who is about to deliver her first baby. She is distraught about her situation and angrily judges the society that for decades had the chance to halt the construction of nuclear weapons but had failed to act. She also agonises over whether it is fair to bring a child into a world that will be profoundly dystopian. But near the end of the film, she delivers a healthy infant, and she and others around her weep as they seem to recognise the beauty of new life.

'The Day After' is one of the most powerful filmic depictions of the horrific destruction brought on by nuclear war, but in the end its plot includes the promise of renewal as well. The film was viewed by 100 million Americans over the two nights it was shown on the ABC television network in November 1983, making it one of the highest-rated television films in US history. Among its viewers was President Ronald Reagan, who reported that its impact was so powerful that it contributed to his decision to negotiate with the USSR over reducing or even eliminating nuclear arms. Thus, like 'Panic in the Year Zero!', this is a film provides a specific narrative about destruction, judgement, and renewal that instantiates a well-established narrative template with echoes of the New Testament book of Revelation.

Narratives about the extinction of human life

Films in this category are rare. One obvious reason for this is that stories about human extinction are deeply unsettling and depressing and hence unlikely to appeal to viewing audiences. Another reason is that in the absence of human actors, the very notion of narrative collapses. It is of course possible to create a natural scientific account of a post-apocalyptic world with no human survivors, but it would not be a narrative in the sense outlined above. Imagining the future in such cases ends in an abrupt and complete void in which the narrative just terminates rather than wrapping things up in a coherent way. As novelist Stephen King once quipped, 'No survivors, no story, am I right?'[12]

Thus, when it comes to human extinction, our society's narrative toolkit is not well stocked or readily accessible, leaving writers and film makers with few cultural resources on which to build. But two noteworthy examples that find a way around this impediment are 'On the Beach' and 'Dr. Strangelove, or: How I Learned to Stop Worrying and Love the Bomb'.

[12] https://www.newyorker.com/magazine/1998/09/07/what-are-you-afraid-of-stephen-king-profile.

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The 1959 Hollywood film 'On the Beach' featured Hollywood stars Gregory Peck, Ava Gardner, Fred Astair, and Anthony Perkins and was based on an apocalyptic novel by Nevil Shute of the same title in 1957. It follows an American submarine crew who survived a massive nuclear war while under water and is charged with finding out whether there are other humans still alive on Earth. Their submarine is based in Australia, which escaped the main effects of the nuclear war, but the population there is experiencing rising levels of radioactive fallout that will eventually kill them as well.

The crew detects radio signals from California that suggest someone is trying to communicate to the outside world, giving them faint hope that other living beings may be there. They travel underwater to San Francisco to investigate and put a crew member on land to find the source of the radio transmissions. He finds no living humans and discovers that the beeping signal comes from a telegraph key that is hooked to a shade blowing in the wind.

Now, with all hope abandoned, the film's characters follow different paths as they face their impending death. One sailor escapes from the submarine and chooses to stay in his hometown of San Francisco to live out his last few days fishing and visiting his old neighbourhood, another returns to Australia to fulfil a lifelong dream of winning an auto race and then commits suicide, and still others go off with friends in Australia to find whatever meaning in life they can while slowly succumbing to radiation sickness. The end for these individuals, as well as for all other humans comes gradually and with some dignity, but it remains a dark story of human extinction.

The 1964 film 'Dr. Strangelove' follows a different path to tell a story of human extinction. This dark comedy and political satire depicts absurd, but deadly US-Soviet tensions that result in a nuclear war. The plot involves a 'doomsday' machine in the form of multiple massive nuclear detonations that will so contaminate the entire planet with radiation that no humans would survive. This was an actual scenario under consideration at the time by strategists of nuclear war, both in the US and elsewhere, so it was part of actual future thinking, not just science fiction.

In one of the film's scenes, Dr. Strangelove (Peter Sellers) engages in discussion with colleagues as the nuclear attack unfolds and considers the possibility of building shelters deep underground that could preserve a small elite group of humans who could repopulate the world after decades or centuries of fallout. This topic of human survival and renewal, however, is just a short diversion and comes too late in the plot of 'Dr. Strangelove' to be a real possibility for renewal. Instead, director Stanley Kubrick ends the film with an orgy of global destruction peppered by irony and dark humour as means for keeping viewers engaged.

Narratives about irreversible and permanent civilisational collapse

Film and television productions in this third category depict post-war settings in which humans continue to exist but are destined for lives that are 'solitary, poor, nasty, brutish, and short' to use the words of Thomas Hobbes (1909). Visual media that instantiate this narrative template often involve time travel in which centuries or millennia have elapsed since a cataclysmic nuclear war, allowing characters to have vague memories and some artifacts from what had gone before. But these do not lead to a renewal of a peaceful and just society. Instead, violent gangs and tribes are usually depicted as ruling the post-war landscape through brute strength and ruthless violence and without the rule of law.

The television series 'Fallout' (2024) is a project of this sort. It is based on an extremely popular video game with the same title. The film is about the long-term aftermath of an imagined apocalyptic Great War of 2077 between China and the US that yielded a world of advanced technologies based on nuclear fusion, futuristic robots, and other technologies.

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But it is also a world without rules and laws in which ghouls, who are products of radiation, along with a few humans on the Earth's surface exist in a state of endless conflict and brutality.

Below the Earth's surface lies a network of sealed fallout shelters, or vaults owned and operated by Vault-Tec, the most powerful private corporation of the world. These vaults allow a select group of humans to lead an artificial, seemingly beautiful life. The professed goal of this system is to re-civilise the brutal surface dwellers in accordance with an idealised vision of American life of the 1950s and 1960s. The entire narrative is anchored in this nostalgic past, making it an exercise in retrofuturism where the future is seen through the past and the past through the future.

More than 200 years after the Great War, a Vault Dweller named Lucy leaves her community to find her father, who had been kidnapped by raiders from the surface. This requires entering the devastated and dangerous Wasteland above ground that had once been Los Angeles and leads to encounters with members of a cult known as the 'Brotherhood of Steel' made up of humans in tank-like robot armour and a legendary bounty hunter, who is a ghoul. Lucy eventually finds her father but learns that instead of trying to build a better society, the leaders of Vault-Tec had all along been driven by capitalist greed and were actually thinking of setting off more nuclear weapons in an effort to maintain power.

'Fallout' is a specific narrative that instantiates a narrative template about permanent civilisational collapse rather than physical extinction. The sense of an ending that anchors the story in this case allows for continued human existence but holds out no hope for the restoration of a just, peaceful, and society based on laws and rules.

Narratives about nuclear war: fear or anxiety?

The three narrative templates outlined here are organised around different endings: renewal after destruction and judgement, human extinction, and long-term societal collapse. Hybrid versions also exist. For example, 'The Day After' suggests societal collapse on a local, temporary scale but suggests the possibility of renewal over the long run.

The fact that it is possible to differentiate these three narrative templates raises the question of whether three corresponding forms of nuclear anxiety might exist. For example, do films about human extinction differ from those about destruction, judgement, and renewal in their capacity to generate anxiety? The sense of an ending for the latter leaves room for life after a nuclear war and thus might seem to be less threatening than the former.

At a more general level, is the term 'nuclear anxiety' the appropriate one in the first place? As noted in the introduction to this collection, 'unlike fear, anxiety has no real object and is an anticipatory experience directed at possible future dangers'. And in her article for the collection, Bergo elaborates on this when she writes, 'a core property of anxiety is *not* to be intentional, when intentionality means "having a mental object", that is, when it denotes "the aboutness of consciousness"'. Each of the three narrative templates has a mental object in the form of an outcome of nuclear war rather than a general, inchoate sense of dread, suggesting that 'nuclear fear' than 'nuclear anxiety' might be the appropriate term.

Does this mean that there might be three distinct forms of nuclear fear corresponding to the three narrative templates? In most public discussions and policy debates nuclear fear does not seem to operate in this way. Instead of distinct fears about human extinction; societal collapse; or destruction, judgement, and renewal, a more generalised fear about nuclear war seems to be at work. Fear rather than anxiety is still at issue, but the object of this fear is something quite general, if not amorphous.

The objects of this generalised fear sometimes is expanded to include civilian nuclear power, even though it is quite distinct from nuclear weapons in terms of intended use, levels of nuclear fuel enrichment, and risk to humans. But the tendency to mix nuclear weapons

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with nuclear power can be found in several research efforts conducted under the heading of nuclear anxiety. For example, Rabow et al. (1990) collected evidence using the Nuclear Attitudes Questionnaire (Newcomb, 1986) that measures attitudes, beliefs, and emotional reactions about nuclear weapons, nuclear war, and nuclear power.

At first glance this may appear to be a matter of undisciplined use of loose categories, but this sort of conflation might actually be a more appropriate way to capture the nature of public discourse than analysis grounded in clear distinctions between nuclear weapons and nuclear power. They both seem to be part of a larger ominous threat. Similar conflation seems to apply to the narrative templates about nuclear war. Distinguishing them may be useful for analytic purposes, but for those engaged in public discussion, this is likely to come off as senseless hair-splitting that begs the question, 'What difference does it make?'

This question, for example, lurks in the background of the 1964 film 'Fail Safe', which tells of how technical and human errors dragged the US and the Soviet Union into an unplanned and unwanted nuclear war. In a scene of a 1960s dinner party of public and policy professionals in Washington DC, a leading analyst of nuclear war strategy 'Professor Groeteschele'[13] holds forth on the cold logic required to win a nuclear war, giving rise to some strong emotional responses from others.

Woman:	Two hours ago, you said 100 million dead. Now you say 60 million
Groeteschele:	I say 60 million is perhaps the highest price we should be prepared to pay in a war
Mr. Foster:	And what's the difference between 60 million dead and 100 million?
Groeteschele:	40 million
Mr. Foster:	Some difference
Groeteschele:	Are you prepared to say the saving of 40 million lives is of no importance?
Mr. Foster:	You miss the point, Professor! The saving of those 60 million lives is what's important.

This interchange does not focus on one or another of the narrative templates outlined above. Instead, it reflects a generalised nuclear fear that would find making any distinctions to be pointless, if not infuriating. No one in the film explicitly asked, 'What difference does it make?', but the stance that Mr. Foster takes seems to reflect generalised fear about nuclear war rather than fear about any concrete scenario based on casualties or a particular narrative template.

This is not to say that people cannot differentiate among the narrative templates. They sometimes do. This often occurs in the context of recognising there are terrible and less terrible outcomes of nuclear war. Perhaps the best sound bite version of this is the assertion that 'The living will envy the dead', which is often attributed to Soviet leader Nikita Khrushchev.

This sound bite continues to be apropos today as reflected in the comment by a CIA spy that, 'I'd rather die than suffer in nuclear warfare'[14] in a discussion of a 2024 book *Nuclear War: A Scenario* in which author Annie Jacobsen breaks down the catastrophe of a massive nuclear war as it would unfold minute by minute after the explosions and then over the months and years that follow. As she notes, the massive death and destruction that would ensue come in stages. It starts with instant death from the blast and fireball at the moment of nuclear detonation and extends to the radiation sickness in the weeks following and massive starvation in the 'nuclear winter' that would extinguish plant life and food on the face of the

[13] A character modeled on Herman Kahn, a major figure in nuclear war planning at the time.

[14] The John Harbinger Show. https://www.youtube.com/watch?v=PWr1VGn1-Ms.

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earth. Along with these physical and biological consequences, she and others note the dangers of massive social disorder and violence that would accompany all this. In short, would those who perish from worldwide famine come to envy those who were instantly incinerated by a nuclear fireball? These various scenarios are reflected in the specific narratives in the films and three narrative templates I have reviewed.

Conclusion

Narratives are powerful and ubiquitous cultural tools for future thinking in general and future thinking about nuclear war in particular. Understanding their impact requires understanding their unique logic built around a beginning, middle, and especially the sense of an ending. Since 1945 these narrative tools have been part of policy discussions about nuclear war, but their promulgation in the general public undoubtedly owes a great deal to visual media such as film and television. These media have repeatedly drawn on three basic narrative templates organised around three different endings: destruction, judgement, and renewal; human extinction; and permanent irreversible societal collapse.

The impact of these media is often discussed under the heading of 'nuclear anxiety', but 'nuclear fear' may be the more appropriate term in discussions where nuclear war is the clear object of concern. This object need not be a single threat that can be differentiated from others as the three narrative templates might seem to suggest. Instead, in many cases the object of fear seems to more amorphous and can draw on any combination of these narrative templates.

However, nuclear anxiety is still an issue in need of understanding. Like other forms of anxiety, it involves indeterminacy and uncertainty about humankind and its moral potentiality, agency, and guilt as discussed in the introduction to this project. It does not have an object in the sense that fear does. Instead, it is an anticipatory experience directed at not-yet-known possible future dangers and decisions. This anxiety calls on humans to go beyond their conformist adherence to everyday norms and identities and enter a sphere of freedom of choice that will require creativity and courage for addressing a new existential threat. Einstein's observation that nuclear weapons have 'changed everything save our modes of thinking and we thus drift toward unparalleled catastrophe' is an invitation to engage in the creativity and courage this new setting calls for.

In the end, most debates about nuclear weapons are motivated by the desire to reduce or eliminate them. This is a goal shared by political leaders ranging from Ronald Reagan to Mikhail Gorbachev[15] to public intellectuals such as Bruce Blair[16] and organisations such as *The Bulletin of Atomic Scientists.* The Nuclear Threat Initiative[17] stands out in this list as an organisation focused on narratives, the control of narratives, and storytelling. All such efforts have as their goal the reduction, if not elimination of nuclear weapons. Pursuing this goal will require an understanding of nuclear anxiety and fear, and a good place to start in this effort is with the narrative tools, especially narrative templates, that shape our ways of thinking and speaking.

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[15] https://www.nytimes.com/2008/07/01/opinion/01iht-edrobbins.4.14135957.html.
[16] https://www.princeton.edu/news/2020/07/21/bruce-g-blair-acclaimed-expert-risks-nuclear-war-dies-72.
[17] nti.org.

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