

# Facing *The Day After Tomorrow*: Filmed Disaster, Emotional Engagement, and Climate Risk Perception

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In his 2009 address to the IPCC, UN Secretary-General Ban Ki-moon expressed his concerns about the risks associated with climate change in perhaps somewhat unexpected terms. The scenarios outlined in the 2007 IPCC report, Ban declared, “are as frightening as a science fiction movie, but they are even more terrifying, because they are real” (Ban). Ban thus introduced his call for a new environmental ethics with an allusion to popular culture, offering a seemingly concrete referent for an abstract scientific scenario. Ban’s resorting to science fiction in his attempt to communicate the urgency of the current environmental crisis points to the difficulties that people experience when trying to imagine the potentially catastrophic outcomes of their current lifestyles. Understanding the implications of local and global environmental risk requires not only knowledge and awareness, but also imagination. The wide distribution of scientific studies and assessments can certainly help raise awareness among the general public, and has done so over the past decades. However, as social science scholars David Lewis, Dennis Rogers, and Michael Woolcock have recently argued with respect to “The Fiction of Development” (2008), imaginary narratives can communicate knowledge about social or economic issues in ways that are different but often just as valuable as scientific or scholarly studies: “Not only are certain works of fiction ‘better’ than academic or policy research in representing central issues relating to development, but they also frequently reach a wider audience and are therefore more influential” (198). The same is true, I believe, for “the fiction of climate change,” and another important strength of such imaginary narratives is that they are much better at engaging emotions, especially (but not exclusively) when the imaginary narrative in question is popular film.

The “science fiction movie” Ban Ki-Moon had in mind when making the aforementioned statement is in all likelihood Roland Emmerich’s 2004 blockbuster *The Day After Tomorrow*, a film that aptly combines features of the melodrama and the disaster narrative to engage its viewers cognitively and emotionally in a spectacular story about abrupt climate change. Produced by Emmerich’s own company Centropolis and the Canadian studio Lionsgate with a budget of \$125 million, and distributed by 20th Century Fox, it achieved a total gross revenue of \$652 million. According to Box Office Mojo this makes Emmerich’s film the second-

highest grossing film of all times in the category “environmental,” behind James Cameron’s *Avatar*.<sup>1</sup> Emmerich’s film also has made it to rank 3 in the category “controversial,” however, beaten only by *The Passion of Christ* and *The Da Vinci Code*.<sup>2</sup> This latter achievement reflects the wide attention the film received not only from reviewers and journalists, but also from climatologists, sociologists, environmentalists, and American government officials, who either lauded, criticized, or vilified the film. While certainly not the first cultural text with a significant effect on the general public in the United States and beyond, it was the first popular film to be credited with—and chastised for—turning public awareness to the issue of climate change.<sup>3</sup>

This social and political impact, I will argue in the following, is to a large degree due to the fact that *The Day After Tomorrow*—like all disaster films—appeals to both rational thinking and emotions as it tells its tale of abrupt and catastrophic climate change. Emmerich transforms abstract scientific scenarios into a concrete story about a specific place and particular people, and he turns current perceptions of risk—anticipated catastrophes, as Ulrich Beck calls them—into audio-visual spectacles that have a direct *visceral* effect on the viewer (see Beck 9). Such a fictional concretization of abstract notions into emotionally engaging stories is important, because as Paul Slovic and other psychologists working in the area of risk perception have found out, emotions matter at least as much as analytical thinking in both risk perception and decision making. Building on the work of Antonio Damasio and other scholars working in the field of neuroscience and behavioral neurology, Slovic explains in *The Perception of Risk* that over time, he and his colleagues “have come to recognize just how highly dependent [risk perception] is upon intuitive and experimental thinking, guided by emotional and affective processes” (xxxix). Although deliberation and analysis are important factors in many decision-making circumstances, says Slovic, “reliance on affect and emotion is a quicker, easier, and more efficient way to navigate in a complex, uncertain, and sometimes dangerous world” (xxxix). In a 2004 article entitled “Risk as Analysis and Risk as Feeling,” Slovic goes even further, stating that “analytic reasoning cannot be effective unless it is guided by emotion and affect” (313) and that “we cannot assume that an intelligent person can understand the meaning of and properly act upon even the simplest of numbers such as amounts of money or numbers

<sup>1</sup> *Box Office Mojo*, accessed on 15 December 2010. <<http://boxofficemojo.com/genres/chart/?id=environment.htm>>.

<sup>2</sup> *Box Office Mojo*, accessed on 15 December 2010. <<http://boxofficemojo.com/genres/chart/?id=controversy.htm>>

<sup>3</sup> Davis Guggenheim’s *An Inconvenient Truth* was only released in May 2006.

of lives at risk (...) unless these numbers are infused with affect” (321). This builds directly on Damasio’s claim, in his groundbreaking *Descartes’ Error*, that “emotion and feeling, along with the covert physiological machinery underlying them, assists us with the daunting task of predicting an uncertain future and planning our actions accordingly” (xxiii). If affect is so central to both the perception of risk and to decision making in the face of such an enormous risk as climate change, an entertainment form that not only reaches millions of people the world over but also succeeds in engaging them emotionally certainly deserves closer attention.

Given the exciting new work done in recent years by cognitive film scholars on emotions and film structure, we are now able to investigate more theoretically the notion that films have the ability to engage emotions. Drawing on the work of Noël Carroll, Ed Tan, Carl Plantinga, and others, who, like Slovic and his colleagues, are interested in the relationship between perception, emotion, and cognition, I will investigate in the following how, exactly, a blockbuster film like *The Day After Tomorrow* engages its (cross-cultural) audiences emotionally while offering them along the way a few lessons about some of the potential dangers of abrupt climate change. That audiences across the world *have learned* some of these lessons as a result of watching this particular disaster movie has been shown in five independently conducted studies in the United States, Britain, Germany, and Japan. The important qualitative research that has been done in these studies is what makes *The Day After Tomorrow* a particularly interesting case. As Fritz Reusswig, the lead author of the German study, points out, the really interesting fact about those studies is that they can offer us some empirical data on the question of “if and how a global media event like the simultaneous launch of TDAT in almost 80 countries across the globe (...) has affected the public with different cultural and political backgrounds in different countries” (“Climate Change, 1).

The social and political relevance of cultural texts is no news to literary and cultural studies scholars; however, they rarely have the privilege of having their findings substantiated by empirical research done by scholars in institutions like the Tyndall Centre for Climate Change Research, the Yale School of Forestry & Environmental Studies, and the Potsdam Institute for Climate Impact Research. This essay aims at drawing connections between these audience response studies on the one hand, and cognitive approaches to film studies on the other, in order to develop a more comprehensive understanding of how, exactly, *The Day After Tomorrow* interacts with its viewers’ emotions, perceptions, and cognitions. Emmerich’s film, I will show, engages its viewers emotionally in both its melodramatic plotline and the mind-boggling spectacle of “natural” disaster. The basic information about climate change it communicates between the lines is thus infused with affect and likely to make an impact on viewers’ perception and cognitive understanding of the issue.

## Responding to *The Day After Tomorrow*: The Reception Studies

Cultural texts do not exist in a vacuum, and when filmmakers imagine environmental risk, they do so in culturally and historically specific ways. Such contextual factors, as reception theorist Janet Staiger reminds us, also account to a large degree “for the experiences that spectators have watching films (...) and for the uses to which those experiences are put in navigating our everyday lives” (1). As Geoff King points out, “between viewer and text come numerous other mediations and meaning-creating factors,” including commercial imperatives, and broader social and historical contexts (7). Cultural, social, historical, and economic factors profoundly circumscribe what filmmakers can imagine and what audiences can interpret and learn, and “so do more particular contextual factors such as class, gender, or racial background, or narrower group or personal histories” (King 7). This is one of the reasons why audience response studies are particularly interesting in cross-cultural comparison. It is thus helpful that the five empirical studies on *The Day After Tomorrow* were conducted more or less simultaneously in four different countries, examining the attitudes of audiences toward global warming before and after seeing the film, and, in one case, also comparing them to the attitudes of non-viewers.<sup>4</sup>

The American study was conducted by Anthony Leiserowitz—a risk perception scholar and the current director of the Yale Project on Climate Change—and published in the November 2004 issue of *Environment*. Leiserowitz is interested in the effects of the massive press controversy that predated and accompanied the release of *The Day After Tomorrow* on the one hand, and in the attitudes of viewers before and after seeing the film on the other. With regard to the first concern, Leiserowitz notes that

(...) some commentators feared that the catastrophic plotline of *The Day After Tomorrow* would be so extreme that the public would subsequently dismiss the

<sup>4</sup> Fritz Reusswig notes in his article on “The International Impact of *The Day After Tomorrow*” that the five independently conducted studies differ in methodology and approach, but asserts that a comparative view can nevertheless offer some relevant conclusions. In another paper, entitled “Climate Change Goes Public,” Reusswig gives the following information about the five studies: all but the American study were based on questionnaires. The American study made use of a web-based survey. Two studies (Reusswig et al and Lowe et al) also used focus groups. The size of the sampling was N=1118 (only filmgoers) for Reusswig et al’s study in Germany, N=384 (only filmgoers) for Aoyagi-Usui’s study in Japan, N=301 for Lowe et al’s study in the UK, N=200 (only filmgoers) for Balmford et al’s study in the UK, and N=529 (filmgoers and general public) for Leiserowitz’s study in the United States. For additional information see Fritz Reusswig “Climate Change Goes Public.”

entire issue of global warming as fantasy (...) others spun a scenario in which, panicked by the movie, the U.S. public would force Congress to pass climate change legislation, President George W. Bush would subsequently veto the bill, and challenger John Kerry would exploit public hysteria over global warming to win the U.S. presidential election. (23)

There is reason to believe, however, that the most “hysterical” reactions were actually those of the Bush administration itself. Leiserowitz mentions a leaked memo from NASA administrators (which was later published by the *New York Times*), which stated that “no one from NASA is to do interviews or otherwise comment on anything having to do with” the film, and that “any news media wanting to discuss science fiction vs. science fact about climate change will need to seek comment from individuals or organizations not associated with NASA” (Revkin). The senior NASA scientist who provided the *New York Times* with this confidential memo reportedly said that he had done so because “he resented attempts to muzzle climate researchers” (Revkin). Regardless of this attempted muzzling of federal climate scientists (which was later partially retracted), the impending release of Emmerich’s film received ample attention in the US media. Leiserowitz’s study reveals that the film generated “more than 10 times the news coverage of the 2001 IPCC report,” and, given that “a key component of the risk amplification process is media attention” this is an important factor in the film’s social impact (34). However, even as that sounds considerable, Leiserowitz reminds us, “relative to other news stories, global warming is [still] a rarely reported issue” (34). At the time when he collected his data, “the Abu Ghraib prison scandal had in turn more than 10 times the coverage of *The Day After Tomorrow*” (34) and thus 100 times the news coverage of the IPCC Report.

With regard to viewer’s attitudes toward climate change before and after seeing the movie, Leiserowitz also comes to clear and perhaps somewhat surprising conclusions. All parameters considered, he summarizes the results of his study thus;

*The Day After Tomorrow* had a significant impact on the climate change risk perceptions, conceptual models, behavioral intentions, policy priorities, and even voting intentions of moviegoers. The film led moviegoers to have higher levels of concern and worry about global warming, to estimate various impacts on the United States as more likely, and to shift their conceptual understanding of the climate system toward a threshold model. Further, the movie encouraged watchers to engage in personal, political, and social action to address climate change and to elevate global warming as a national priority. (34)

As far as audience response goes this is pretty impressive. And it is not a purely American phenomenon either. The international impact of *The Day After Tomor-*

row was, as Fritz Reusswig from the Potsdam Institute for Climate Impact Research notes, somewhat but not entirely different. The changes in attitudes of the German audiences that Reusswig surveyed in his own study were less dramatic, which he ascribes to a large degree to the fact that in this case a large portion of the audience was already sensitized to the issue of climate change, so much so, in fact, that it was one of their main reasons for watching the film (this was different for the American audience, which was primarily interested in seeing Emmerich's latest disaster movie). Nevertheless, Reusswig concludes that the film *did* have significant effects on its German viewers and that "the entertainment industry seems to have done quite a lot for the public awareness of climate change" ("International Impact" 43).

The two British studies came to similar conclusions. "Overall," Andrew Balmford et al note, "our findings confirm that intense dramatizations have real potential to shift public opinion" (1713). However, the researchers add, "the question remains whether such portrayals can be made more accurate (and thereby less confusing) without losing their popular appeal" (1713). Lowe et al, the authors of the second British study, conclude that "our research shows that seeing the film, at least in the short term, changed people's attitudes; viewers were significantly more concerned not only about climate change, but also about other environmental risks such as biodiversity loss and radioactive waste disposal" (2). The Japanese study, which was conducted by Aoyagi-Usui at the National Institute for Environmental Studies (NIES), has remained unpublished, but Reusswig reports in his comparative overview of the five studies that Japanese interviewees actually perceived abrupt climate change scenarios as *less* likely after seeing the film, while showing at the same time a higher motivation to take individual action to prevent it ("Climate Change" 2). Reusswig concludes that "the success and impact of 'The Day After Tomorrow', as explored by the five studies, indicates that we should be more attentive to the issue of awareness raising and education—and slightly more optimistic too" ("Climate Change" 3). Thomas Lowe's final judgment about the film, published one year later, is less positive. Despite the film's potential "to tap into the accessible parts of psychological function," he writes, it "falls short of being the ideal risk communication tool by departing from the realms of reality and failing to offer audiences a basic understanding of causes and measures for mitigation" ("Vicarious Experience" 5).

It is probably safe to say that Emmerich never planned to create "an ideal risk communication tool," but Lowe nevertheless has a point.<sup>5</sup> *The Day After Tomor-*

<sup>5</sup> Lowe's formulation is in fact somewhat problematic here, since it seems to suggest that there might be such a thing as an "ideal risk communication tool" to begin with. However, as Ulrich

row significantly departs from the realms of reality and science, and it depicts a scenario that is far beyond mitigation. The question remains, then, why the film has nonetheless been moderately successful in raising awareness for climate change risks among its audiences, and why, as Leiserowitz asserts, it even encourages watchers to engage in personal, political, and social action. Paradoxically, a good part of the answer to that question is that *The Day After Tomorrow* comes across as pure entertainment, with no apparent pedagogical agenda to push, but with a strong *visceral* and *emotional* impact on its audience. Before I turn to the film itself I want to outline some of the very useful and convincing ways in which film scholars who use cognitive approaches have theorized the emotional structure of film and its impact on the viewer.<sup>6</sup>

### **The Affect of Cinematic Narration: Cognitive Approaches to Film Emotions**

Movie theaters, as film scholars Carl Plantinga and Greg M. Smith remind us, occupy a central place “in the emotional landscape of the modern world as one of the predominant spaces where societies gather to express and experience feelings” (1). Not only is much of our experience of films saturated with emotion, but, as Noël Carroll notes, “our emotional engagement constitutes, in many instances, the most intense, vivid, and sought-after qualities available in the film experience” (24). Movies, Carroll argues, are “objects that are well constructed to elicit a real emotional response from our already existing emotion systems” (23) and the emotions we experience when watching a tear-jerking melodrama, a scary horror film, or an arresting suspense drama are thus not really different in kind from the ‘real’ emo-

Beck points out in *World at Risk*, risk perception is a highly complex issue, which is why it is a problem that risk communication is often imagined as an information flow from rational, scientific experts to irrational, subjective laypeople. Such an understanding, Beck explains, tends to bracket and dismiss important factors, “such as different forms of non-knowing, contradictions among different experts and disciplines, ultimately the impossibility of making the unforeseeable foreseeable” (12). Lowe seems to have noticed the problem inherent in his overly strong claim. In his “Is This Climate Porn?,” published several months later, he uses an almost identical formulation but speaks of a “conventional risk communication tool” (5) rather than an “ideal risk communication tool.”

<sup>6</sup> Not all film scholars who assume a cognitive perspective are interested in the affective dimension of filmic narration. For good introductions to the field and the role of psychological concerns in it see David Bordwell, “Cognitive Theory” (2009); Carl Plantinga, “Cognitive Film Theory: An Insider’s Appraisal” (2002); Carl Plantinga, “Affect, Cognition, and the Power of Movies” (1993).

tions we have in our everyday lives. What is different is that in life there is much less guidance or direction for our emotions. Our perception, as well as our emotion system, is constantly confronted with a massive array of largely unstructured data, and when we react emotionally to a real-life situation, we have to filter out the relevant elements from this constant information overload. When we watch a film, Carroll explains, the situation is different. Here, “the filmmakers have already done much of the work of emotionally organizing scenes and sequences for us through the ways in which [they] have foregrounded what features of the events in the film are salient” (Carroll 28). Films *guide* our emotions while we watch them; as Greg Smith puts it, they continually “offer [us] invitations to feel” in certain ways (12). We can accept those invitations and “experience some of the range of feelings proffered by the text,” or we can reject them (G. Smith 12). If we choose to accept them, the film becomes a full body experience, because emotions, as Carroll explains, involve both cognition and “feelings,” the latter being “sensations of bodily changes, like muscle contractions,” or the welling of tears (Carroll 24).

Drawing on the insights of cognitive psychology and neuroscience rather than on the methods of psychoanalytical research, cognitive film scholars like Carroll, Plantinga, and Smith argue that there is really no strict division between rational and emotional cognition, and that the spectator’s faculties of cognition and judgment are in fact of central importance in the process of eliciting an emotional response to film.<sup>7</sup> As Plantinga points out, “one cannot seriously examine emotional effect without considering perception and narrative comprehension” (“Trauma” 239). This also explains what Plantinga calls the “conditional realism” in spectator response: the viewer experiences emotions that are very similar to what she would feel in a “real” situation, with the difference that she is at the same time aware of the fact that what she watches is a *fiction* and that this fiction is *mediated* (see “Trauma” 239). As communication scholars Busselle and Bilandzic put it, “the experience of comprehending and engaging with a narrative is complex and multifaceted, involving losing awareness of some aspects of the actual world and gaining awareness of both cognitive and emotional aspects of an alternative world” (Busselle et al). Also, as both Plantinga and Busselle and Bilandzic point out, the viewer will usually have an understanding of genre conventions and bring other previous knowledge to the film which might amplify her emotions or interfere and conflict with them.

<sup>7</sup> David Bordwell and Noël Carroll’s edited volume *Post-Theory: Reconstructing Film Studies* is very helpful for a better understanding of how cognitive approaches challenge the long-standing dominance of poststructuralist and psychoanalytical approaches.



Central to the emotional engagement of the audience in narrative films is, generally, the main character or hero of the story, but sympathy or antipathy for protagonists or villains are not the only emotions that keep the viewer engaged in the plot of a film. Plantinga identifies three other categories of emotions that films elicit in viewers: direct emotions, which are “responses to the narrative and its unfolding;” artifact emotions which are directed at the film as an artifact; and meta-emotions, which are aimed at the spectator’s own responses or those of other spectators” (“Trauma” 242). These emotional responses are often mixed and tend to interact or interfere with each other, and they are necessarily different for different viewers in different audiences. Nevertheless, the film text itself offers its viewers certain emotional positions—invitations to feel, as Greg Smith would put it—and I want to dedicate the last part of my essay to working out at least some of the countless “invitations” offered by Emmerich’s *The Day After Tomorrow* and relating them to the film’s emotional and cognitive effect on its audiences.

### **Melodrama, Science, and Spectacle: The Emotional Appeal of *The Day After Tomorrow***

Emmerich’s film opens in the vast white expanse of Antarctica. The first minutes of a film set the tone for the rest of the story, and the first scenes of *The Day After Tomorrow* serve several purposes: firstly, a high-angle tracking shot—basically a simulated helicopter shot—introduces us to the breathtaking beauty of the polar region—a “natural” beauty, one should keep in mind, which is wholly computer-animated. When we finally see a group of (equally animated) humans, they look tiny and insignificant in this vast landscape, but as we get closer we realize that they are not, actually, lost. As the prominent American flag indicates, the isolated humans on the Larsen B Ice Shelf are a group of American scientists doing ice core drillings, and the second purpose of these first minutes of the film is the introduction of Jack Hall (Dennis Quaid), a paleoclimatologist who combines in one person the qualities of the melodramatic hero and the action man of the typical disaster film.<sup>8</sup> Without much ado, the film goes on to demonstrate Jack’s action hero qualities. While his inexperienced colleague does the drilling, a gigantic fracture sud-

<sup>8</sup> The screen-filling American flag not only eases the cut from animation to partial animation combined with life action, it also tells us clearly that this is going to be a story about the United States. The rest of the world really only exists as a cipher in Emmerich’s film, despite his somewhat whimsical attempts to add a global dimension through the inclusion of a few scenes in Ireland, Japan, and India.

denly forms in the ice, leaving the scientists' little camp at the edge of an enormous abyss and their extracted ice cores on the other side. Without hesitation, Jack jumps across the abyss, salvages the ice cores and, with another, even riskier leap, returns to his comrades. As the camera zooms out we witness the spectacular breaking off of an ice shelf "the size of Rhode Island" which foreshadows the coming disaster—the third purpose of this opening sequence.

The first and third of these purposes are fulfilled brilliantly: as spectators, we feel the emotional impact of both the beauty of nature (aided by the excellent musical score) and its destruction (aided by our previous knowledge about the effects of climate change).<sup>9</sup> The powerful evocation of a breathtakingly beautiful but suddenly also threatening and threatened natural landscape elicits awe in us for the sheer beauty of the images and sadness for a vulnerable ecological space. The second purpose of the opening scene, the introduction of the scientist as action hero, is arguably rather less successful. When Jack jumps heroically across the expanding crevasse in the ice cap to save the precious ice cores, most viewers are likely closer to laughter than awe. As paleoclimatologist William Hyde scathingly remarked in a blog after seeing the film, "the movie is at its most stunningly accurate in its portrayal of paleoclimatologists. Paleoclimatologists are notoriously brave and of course very fit. Nary a one of us would hesitate to jump a widening crevasse—twice—while wearing arctic gear—to recover some ice cores which would take 2-3 hours to re-drill" (Hyde). Even if we find the unrealistic nature of Jack's actions amusing rather than stunning, however, he is now established as a dedicated scientist who does not hesitate to go to physical extremes if he deems it necessary.

After his daring stunt in the melting ice of Antarctica, we next see Jack in the confined political space of a UN conference, explaining the scientific scenario of abrupt climate change to the assembly members and thereby supporting, as Sylvia Mayer has pointed out, "an anthropocentric environmental ethics that insists that human welfare depends on considerations of ecological processes" (106). This is the moment in which the film establishes a rational notion of risk, one that is very similar to the climate change risk scenarios we have heard about in the real world. However, Jack is confronted with ignorance and a strong belief in short-term profits, and he thus cannot succeed in warning the politicians of the world about the catastrophe that they are bringing about. With these first two sequences, his two vastly more powerful opponents are established: the American government—personified in the film by a vice president who bears a striking resemblance to Dick Cheney—and "nature," which will from now on become increasingly more

<sup>9</sup> For a cognitive perspective on the emotional effects of film music see Jeff Smith, "Movie Music as Moving Music: Emotion, Cognition, and the Film Score."

hostile. The figure of Jack, who emerges as a powerless but morally righteous hero in the face of human ignorance and greed, asks us to empathize with his position, and this is easy for us because—as in any melodrama—we already sense that he is right and that his opponents are stupid, dangerous, and wrong.<sup>10</sup>

As we will soon realize, Jack is not only handsome, righteous, and “notoriously brave,” he also has, as Matthew Nisbet has observed, a number of other qualities: “He drives a hybrid car (...) shares a strong bond with his co-workers, and risks his life early on in the film to save his colleague. (...) The only downside to Quaid’s character is that he is a workaholic. He is completely devoted to climate science while missing out on his family life” (Nisbet). Jack thus has a number of virtues and only one serious (and forgivable) flaw, which he will resolve to correct in the course of the story. These qualities are part of what makes him a typical melodramatic hero: a highly virtuous David-figure forced to struggle against an overpowering, Goliath-like enemy for the common good and the well-being of others. It does not take long until we realize, together with Jack, that the process he described to the UN Assembly will not in fact happen in 100 or 1000 years, but right now and very quickly. Thus the much more commanding of his two opponents—nature, which has considerable agency in the film—begins to determine the direction of the story, first with vicious tornadoes, and later with towering flood waves and enormous storm systems that allegedly suck down from the stratosphere air so cold that it freezes everything it touches.

These scenes of disaster are the “money shots” of the film and in all likelihood the main reason why Emmerich wanted to make it. They come with powerful images and sounds that have a strong visceral effect on the spectator, engaging her emotionally on the nonempathetic level.<sup>11</sup> Geoff King has suggested that one theme common to many disaster films “is that of ‘natural’ or elemental force breaking into the paved, built-up and ‘civilized’ (...) or ‘decadent’ and ‘artificial’ worlds created by humans” and that “the principal targets for destruction are symbols of luxury, decadence [and] arrogance” (146). To witness the annihilation of

<sup>10</sup> For detailed accounts of melodrama in film narratives, see Robert Lang, *American Film Melodrama* and John Mercer and Martin Shingler, *Melodrama: Genre, Style, and Sensibility*. For an interesting discussion of the function of melodrama in disaster films see Despina Kakoudaki, “Spectacles of History: Race Relations, Melodrama, and the Science Fiction/Disaster Film”.

<sup>11</sup> I am taking this term from Tan and Frijda, who differentiate between empathetic “F emotions” and nonempathetic “A emotions.” The first group consists of “responses in the fictional world” including “sympathy, compassion, and admiration.” The second group of emotions includes the enjoyment of “the sight of a majestic landscape” and is independent from “the significance of the situation for the protagonist” (52).

famous cultural landmarks—the first twister in *The Day After Tomorrow* swiftly erases the Hollywood sign—seems to be immensely pleasurable for a large number of moviegoers and one of the main reasons why they go to see a particular film. King hypothesizes that this pleasure may be related to the specific emotional effect of such scenes. In contrast to the order and coherence provided by narrative, he suggests, “moments of spectacle may offer (...) the illusion of a more direct emotional and experiential impact” (36). However, King does not explain why spectators would only experience the “illusion” of such a “direct emotional impact.” In the eyes of cognitive film scholars at least, the emotional impacts of cinematic spectacle are hardly an illusion. Rather, such spectacular scenes work directly on the spectator’s emotion system, triggering real emotional responses such as pleasure and awe.

Ed Tan and Nico Frijda suggest that the nonempathetic emotions provoked by awe-inspiring imagery must not necessarily be “immediately associated with the film story’s action or with an understanding of the protagonist’s feelings” (62). Such imagery, which may portray “an environment in which one feels tiny and insignificant” or other visually and aurally overwhelming scenarios, can, according to Tan and Frijda, trigger two kinds of response: “On the one hand, the stimulus may be attractive and call forth fascination. (...) On the other, it may have a repellent quality, eliciting a tendency to shiver and look for shelter” (62). The disaster spectacle of *The Day After Tomorrow* arguably triggers both responses at the same time, which is part of what makes it so attractive to a mass audience. When American moviegoers who watched Emmerich’s film “were found to have significantly higher risk perceptions than ‘nonwatchers’” (Leiserowitz 26), this may have been at least partially a result of the nonempathetic emotions they experienced while watching the most spectacular scenes of film, emotions that include fascination, awe, and a vague sense of fear.

One complaint leveled at *The Day After Tomorrow*, not only by reviewers and other commentators but also by the authors of the five reception studies, is that its spectacular disaster scenarios depart significantly from the predictions of climatologists, and that they generally violate notions of scientific plausibility. However, as David Ingram has pointed out, we miss the point of Emmerich’s film if we simply dismiss it for its scientific inaccuracies. As a science fiction film, Ingram explains, Emmerich’s movie uses “realist elements of climate science as a starting point for melodrama and fantasy, so that it can dwell on the spectacle of extreme weather . . . and also invite the audience’s emotional engagement with the human interest story that becomes the main focus of narrative” (55). The human interest story is of course directly related to the spectacle of disaster and gains additional appeal from it. As Geoff King has observed, “narrative and spectacle can work together in a variety of changing relationships” (2) and “spectacle can have an im-

pact similar to that of driving linear narrative: it has the potential to reinforce, almost physiologically, whatever the narrative asserts” (34).

This clearly is the case in *The Day After Tomorrow*. The narrative asserts that a failure to act in the face of tremendous environmental risk will lead to unprecedented human catastrophe, and the film’s spectacle most powerfully reinforces this assertion. Since the unleashed natural forces are too powerful an opponent to be stopped or beaten, Jack’s goals must focus on something that he actually *can* try to accomplish, albeit against tremendous odds: the timely evacuation of a part of the American population, and, to make the story personal and emotionally moving, the highly melodramatic rescue of his son Sam (Jake Gyllenhaal). Both of these goals are related, since Sam is in New York City and thus above the line that Jack draws on a map of the United States, indicating to the American government the divide between those that can be saved (the Southern half) and those that must be sacrificed (the Northern half).

In this highly emotional scene we again see a confrontation between the heroic scientist and the American government, but now the tables are turned. If Jack was the isolated outsider in the first scene (before the UN Assembly), now it is the ignorant vice president. The conflict-ridden expert-layperson relationship that emerges in this and in the earlier scene remains central to both of the film’s main storylines. On the one hand, *The Day After Tomorrow* shows us a battle between Jack and other scientists (the experts) and the politicians (the laypeople) who have to make far-reaching decisions; on the other hand, we have a group of people in the New York Public Library who are confronted with conflicting information, most of it hearsay, and who also have to make existential decisions. In this group it is Jack’s son Sam who takes on the role of the expert, since he has, through his father, privileged access to scientific knowledge. As we soon learn in the film, those who listen to the experts survive, while those who do not either drown or are later found frozen in the snow. The two plotlines and the moral messages they assert are thus directly—if sometimes crudely—linked to the film’s spectacular disaster scenes, and the emotional appeal of the spectacle supports and reinforces the assertions of narrative.

Central to the emotional engagement of the audience in narrative films are, as I pointed out earlier, the protagonists of the story, and it is significant that in *The Day After Tomorrow* the main characters are all scientists or similar experts. Emmerich’s scientists are not aloof nerds, but mildly flawed and highly emotional heroes, who seem to act irrationally because in the face of ecological risk they stick with their gut feelings and trust and belief in each other and in science. Jack is in love with his work and his main heroic act in the film—his long walk from Washington DC to New York in a subzero ice storm—is motivated solely by the promise that he made to his beloved son. Stephen Keane has argued that “disaster films are innately passive and survivalist (in the sense that when their central disasters occur

the characters have no choice but to try to make their way up, down, or out to safety)” while “action movies are innately active and escapist” (53). Emmerich combines the two modes, however, and thus ends up with a main character who is motivated by love, and who is active rather than survivalist in the face of disaster. While Sam and his companions in the New York Public Library are passive in that they are forced by the disaster to fight for their survival, Jack’s desperate attempt to save his son is an active decision, and his physical exposure to the storm a voluntary act that is based on moral obligation and love.

This highly emotional and melodramatic story is at the heart of the film, all filmic catastrophes and special effects notwithstanding. As Robin Murray and Joseph Heumann point out in their 2009 *Ecology and Popular Film*, the main plot of *The Day After Tomorrow* “revolves around Jack’s quest to save his son and his son’s evolution into a new eco-hero like his father ... Jack makes his heroic journey not to save the world—as we might expect an eco-hero and a climatologist to do—but to save his son” (10). The narrative invites the viewer to empathize with Jack and Sam, to see the fictional world through their eyes, and to feel sympathy for their goals and struggles. Carl Plantinga explains that sympathetic emotions typically “arise when the spectator assesses the narrative situation in response to a favored character’s predicament and goals. When the viewer develops a concern that the goals of the character be met, this creates a desire for the attainment (...) of the character’s desired state or the escape from or avoidance of an aversive state” (*Moving* 88). *The Day After Tomorrow* asks us to care for Sam’s goal of survival and of saving the girl he is in love with, and for Jack’s goal to save as many Americans from the storm as he can and to keep his promise to his son. In face of a disaster of enormous proportions, Jack learns from his old mistakes and thus creates a new basis for his relationship with his son.

‘Learning from one’s mistakes’ is a recurring theme in the film, both in the private and the political sphere, and it is clearly the message that the viewer is supposed to grasp. Catastrophes are often said to have transformative effects, and in *The Day After Tomorrow*, this certainly is the case. The greatest personal transformation and learning experience, however, is, surprisingly, not accomplished by Jack or his son, but by the man who so much looks like Dick Cheney, and who is now the new president of a United States that is as much changed as he himself is. In his first TV address to the nation after the disaster, he displays a new sense of humility and environmental ethics: “For years we operated under the belief that we could continue consuming our planet’s natural resources without consequences. We were wrong. I was wrong. The fact that my first address to you comes from a consulate on foreign soil is a [testimony] to our changed reality.” This is of course the central moment of catharsis and recognition, the moment that the film insists most blatantly on its environmentalist message. Even the new American president—previously Jack’s opponent—has now learned from his mistakes and ac-

knowledges that the mindless consumption of the earth's resources is unsustainable and morally wrong. It has only taken a few billion casualties for him to make that step.

Emmerich juxtaposes the presidential address with high angle tracking shots, which—as in the opening scene—show a white landscape (to the same musical score), with the difference that now that white landscape is New York City and the beautiful, peaceful white cover functions as a shroud that hides the millions of people lying dead underneath it. Like most makers of disaster movies, Emmerich makes sure that we do not dwell too much on the pain and death of the victims of the catastrophe and instead empathize with those who struggled and survived. Even as the film reaches its problematic happy ending, however, some things are shown to have drastically changed. As Sean Cubitt notes, *The Day After Tomorrow* builds “a sense of the unique as well as overwhelming character of disruption” (130). The monstrous nature at work in the middle of the film is stable and seemingly tamed again at the end, but America and the rest of the world are permanently transformed and order is *not* reestablished. Only utter devastation and disruption, Emmerich seems to suggest, can finally give humanity the ability to learn from its mistakes and change its unsustainable practices.

## Conclusions

As its title suggests, Emmerich's film is set on the (ever shifting) “day after tomorrow”—that is, the near future. It is thus a piece of speculative fiction, or to put it in more familiar film terms, an eco-dystopian science fiction. As such, it stands in a longer tradition, one which, as Frederick Buell has pointed out, has historically “been anything but mere escapist fantasy. Just the opposite: it has not just reflected but influentially intervened in heated contemporary environmental-political disputes from its inception to the present day” (248). This is definitely true for Emmerich's film, regardless of its manifold flaws and shortcomings. As both Reusswig et al and Lowe et al point out in their studies, *The Day After Tomorrow* does not tell its audience anything about mitigation options; nevertheless, it “has triggered mitigation reactions in its public” (Reusswig et al 58). In many ways, Reusswig et al note, the film successfully relies on already existing perceptions of global warming risk—however vague they may be—and on its viewers' preexisting knowledge about mitigation measures.

While this is true, it is unlikely that the film would have been as successful in raising awareness had it only depicted a catastrophic scenario of abrupt climate change without engaging its audience emotionally in a hero's journey. As Thomas Lowe points out, “the moral sub-plot of the film, in which Jack Hall failed to be a proper father and wanted to make good his mistakes, could carry an important

message. Perhaps it suggests to the viewer that society needs to think about its actions in general, not just with regard to the environment but to humanity as a whole” (“Vicarious Experience” 75). This is almost certainly part of the explanation as to why the film has been so effective in raising its viewers’ climate risk perception. As viewers, Noel Carroll explains, we “tend to accept the projects of characters ... who strike us as virtuous” (40). And since “the efforts of the protagonists [tend to be] morally correct in accordance with the film’s ethical system” (40), we tend to adopt that ethical system as ours, at least for the duration of the film. Jack Hall asks us to be concerned, with him, about the catastrophic outcomes of unmitigated climate change and for the lives of those people who will be directly affected by those outcomes. Although not discussing those risks critically or even correctly, *The Day After Tomorrow* thus succeeds in both of the main goals that Emmerich claims to have had when making the film: it has become a highly successful entertainment movie *and* it alerts and educates its audience about the real risks and dangers of climate change. As Leiserowitz notes, these divergent goals sometimes “coexist in an uneasy tension within the film” (26); however these tensions seem not to interfere in the least with its success: at least in the United States, “70 percent of the [interviewed] moviegoers rated the movie as good or excellent” (26). Furthermore, Reusswig writes that “the impact studies of *The Day After Tomorrow* have entered a new, reflexive area of climate change research: the area of the impacts of impacts. Twentieth Century Fox Germany has established an initiative to facilitate emissions trading rights and reducing CO<sub>2</sub> emissions of services, events, and traffic” (“International Impact” 43). This reaction of a film studio to a scientific study can of course be dismissed as mere PR ploy, but given that the film industry emits significant amounts of CO<sub>2</sub> in the production and distribution of their products, it is a real-world effect that should not be underestimated.

All of this sheds a different light on the question that has been posed by a number of environmental film critics in the past years: whether or not a film that is designed to become a major blockbuster can approach an environmental topic seriously and affect the public in ways that are conducive to building healthier and more sustainable human-nature relationships. The staggering success of the latest mega-blockbuster with an openly environmental theme—James Cameron’s *Avatar* (2009)—only makes this question more pressing. In this context, we should take seriously Lowe’s contention in that “popular reporting of climate change in the style of environmental ‘science fiction’ (...) creates a nagging concern, the solution to which is felt to be beyond the reach of the ordinary person” (“Climate Porn” 2). But this should not lead us—at least not directly—to the conclusion that popular film cannot function as “a catalyst for change” (2), as Lowe suggests. Rather, we should conclude that additional research needs to be conducted, ideally substantiated by audience response studies. Four of the five studies on *The Day After Tomorrow* were conducted in Western societies and all five in highly industrialized



countries, which tells us nothing about receptions in countries like India and China, to name only two examples. As Anthony Leiserowitz puts it pointedly at the end of his article in *Environment*, “we have only scratched the surface (...) in the effort to understand the role of popular representations of risk (such as movies, books, television, fiction, and nonfiction) or of cross-national differences in public risk perception and behavior” (44). A very good reason, I believe, to study such texts closely also from a cognitive perspective.

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