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Bearing Witness? Polar Bears as Icons for Climate Change Communication in *National Geographic*

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ABSTRACT

This article investigates how polar bears were established as icons of climate change in the popular science magazine *National Geographic*. In a multistep process, anthropomorphized depictions first established polar bears as subjects of identification. Then, polar bears were visually connected to the endangered Arctic. Finally, they emerged as ambassadors of a threatened ecosystem and icons of climate change. I highlight the wider political contexts of this process of iconization and the semiotic and cultural resources on which it draws, showing what kind of climate change communication the polar bear icon enables or inhibits. The icon lends itself to being deployed in visual communication strategies creating personal concern and public awareness for climate change. At the same time, the icon fosters an individualized, emotionalized, and localized account of climate change but does not make its wider causes visible.

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Introduction

A polar bear, adrift on a melting ice floe, a polar bear desperately clutching to some blocks of ice, or a polar bear expressing emotions of sadness or distress; these images no longer appear to present a particular animal, place, or time (Hansen & Machin, 2008). Today, it seems almost impossible not to associate them with climate change. In recent years, polar bears have been used in many campaigns connected to climate change in order to raise awareness of and engagement with the issue. An animated bear splashed through Al Gore's *An Inconvenient Truth* while a “real one” was put on the cover of Time magazine. Coca-Cola's and the World Wide Fund's “Arctic Home” sells “Polar Bear Adoption Kits,” including stuffed polar bears (Dunaway, 2009). And since 2013, *Greenpeace*'s oversized polar bear marionette, Aurora, has joined many climate change activists on the street (Huggan, 2016). The polar bear has been termed the “poster child” of climate change (Owen & Swaisgood, 2008, p. 123) and has apparently become iconic of the melting of the Arctic ice shield due to anthropogenic climate change (Dunaway, 2009).

Probably one of the biggest challenges for humanity in the twenty-first century, anthropogenic climate change is also strongly contested politically and is irrevocably linked to questions about the relations of nature, culture, science, and politics. Therefore communicating these issues to a broader public is of vital importance and may be facilitated by the polar bear icon, which gives climate change a “face” and embodiment as a stand-in for humanity (Slocum, 2004). Clearly, empathy and affinity play a major role with respect to this icon. But of late, its effectiveness has been

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questioned (Mooallem, 2013). Polar bear images may inhibit understanding the human aspects of the issue or imagining solutions for change (Dunaway, 2009) and might even be met with resistance (Stenport & Vachula, 2017). Manzo (2010a) argues that, while the icon of the polar bear may arouse emotions, such pictures do not foster understanding. Since images that evoke fear also create emotional distance and feelings of disempowerment (O'Neill & Nicholson-Cole, 2009), they might be “counter-productive for ‘meaningful engagement’” (Manzo, 2010a, p. 198). However, a study by Swim and Bloodhart (2015) suggests that visual engagement with polar bears based on empathy may help create climate change awareness. Many of these studies try to assess audiences’ uptake of these images, testing the icon’s efficacy in fostering public engagement with climate change. In contrast, this paper pursues a different approach: it investigates the ongoing process necessary (Hansen & Machin, 2013) for polar bear images to gain pervasive iconic status. Reconstructing this process is important to understand the semiotic and cultural resources on which the icon draws, as well as what kind of climate change communication it enables or inhibits. This paper thus complements audience reception studies by showing how the icon of the polar bear fosters an individualized and localized framing of climate change based on emotions and the anthropomorphization of nature, while distracting from the more systemic causes of the issue. While several studies have investigated the polar bear icon in mass media (for an overview see O'Neill & Smith, 2014), this study focuses on popular science magazines, which constitute unique spaces where public imaginations regarding issues such as climate change are shaped (Whitley & Kalof, 2014). Using *National Geographic* as an example, I show how polar bears have gradually attained the status of climate change icons within a visual discourse embedded in a particular cultural and political context.

In the following, I will first review literature that examines the difficulties of visualizing climate change and the possible pitfalls of using polar bears as its visual icons. Then I will discuss popular science magazines’ role in climate change communication, thereby conceptualizing them as hybrid spaces of science communication. I show how *National Geographic* is embedded in, as well as representative of, what could be seen as “American culture” and therein fulfils an important educational role. Framing this research as a multimodal analysis that uses a variety of methods to analyse visual and verbal discourses, I then recount what I call the “process of iconization” of polar bears within *National Geographic*. Linking this process to the wider cultural and political context of climate change discourses in the US, I explain the social and scientific backdrop against which the icon gained its meaning and appeal. I also draw attention to the implications of the gaze included within these iconic images as well as to what is not being shown, opening up a discussion about strategies for visualizing climate change. This article thus contributes to a wider debate about visual climate change communication and how these communicative efforts may influence public perceptions and inform policy actions.

Picturing climate change

Climate change is a notoriously difficult issue to communicate because it is scientifically complex, not easily graspable and deals with vast timespans that lie mostly in the future but are connected to the past (Doyle, 2009). Yet it leads to global consequences, which are simultaneously uncertain and intangible (Jasanoff, 2010). Visualizations offer important means of facilitating climate change communication, creating a more tangible idea of this abstract issue (O'Neill & Nicholson-Cole, 2009). By communicating feelings directly, unmediated by verbal arguments (Joffe, 2008), images and visualizations can help to emotionally anchor the issue, a “processes by which a new phenomenon is attached to well-known positive or negative emotions” (Höijer, 2010, p. 719) thus creating a more personal engagement with climate change (Lorenzoni, Nicholson-Cole, & Whitmarsh, 2007). Yet the visual communication of climate change is also difficult and not without its pitfalls (Doyle, 2009). Visualizing the large spatial and temporal scales of climate change can pose a challenge to communicators. Also, images can always be read on different levels and produce different meanings

(O'Neill & Smith, 2014), although their reception by the audience can never fully be assessed and depends on the cultural and social circumstances under which images are read—circumstances that are themselves subject to discussions and change (Whitley & Kalof, 2014). Yet, despite the necessity and complexity of visuals in climate change communication, until recently many studies have focused on written discourses and only lately has the visual become an explicit focus (O'Neill & Smith, 2014).

When studying visual representations of climate change, it is important to keep in mind the specific qualities of visual material. Images are analogical, relying on similarity for their interpretation. Also, they lack propositional syntax, thus causalities are implied rather than explicitly stated. Further, images, especially photography, are perceived as portraying reality rather than being representations of particular world-views (see O'Neill & Smith, 2014). Yet, images always represent a certain “gaze”, i.e. a certain perspective that influences their content and statements. The practices of imaging and looking always (re)produce specific power relations by constituting viewing subjects and objects that are being looked at (Clarke, 2005). In this sense, images are always political and carry a certain message through which they influence people's actions and choices (Doyle, 2009). Thus, it is important to analyse the political and normative meanings embedded within and communicated through the icon of the polar bear as well as what this particular “gaze” enables one to see and what it makes invisible.

Manzo (2010b) discerns a repertoire of images that are repeatedly used in visual climate change communication, travelling through different contexts, and attaining different meanings. Climate icons are “symbolic representation for more than what is immediately apparent,” which is to say that what constitutes the icon is not the immediate content of the image but how it is perceived and conceptualized in a specific context (O'Neill & Hulme, 2009, p. 403). One of these images is the icon of the globe, also called the “blue marble,” which is often depicted as melting or burning. This icon refers to the globality of the issue, taking up the notion that Earth is a vulnerable planet (Jasanoff, 2001). A more “scientific” version of this theme is maps which, through the use of different colours, visualize predictions of where most of the warming might occur. Such forecasting visualizations enable a potential future to become a publicized present (Mahony & Hulme, 2014). Other recurring visual themes include the depiction of flooded areas (with or without humans) (Manzo, 2010b), drought, smoking chimneys, and melting glaciers or polar regions (Carey, 2007)—with or without polar bears.

The terms of definitions I follow Perlmutter's (2006) differentiation between *distinct icons*, single famous shots and *generic icons*, images that are repeatedly shown to describe a specific phenomenon. Furthermore, I apply Hariman and Lucaites (2007) conceptualization of photojournalistic icons as

photographic images appearing in print, electronic or digital media that are widely recognized and remembered, are understood to be representations of historically significant events, activate strong emotional identification or responses and are reproduced across a range of media, genres, or topics. (p. 27)

While such images represent dominant ideologies, they are also useful resources in communicative efforts, fostering understanding of events and possibly influencing political behaviour (Lucaites & Hariman, 2001).

Huggan (2016) describes the icon of the polar bear on the one hand as a “physical and visual embodiment of the Arctic” (p. 14) and, on the other, as a symbol of the planet's and humanity's vulnerability. In their function as communicating climate change, polar bears have been termed “boundary objects” (Star & Griesemer, 1989), bridging the local and the global aspects of the issue. Therefore, they can be regarded as “material-semiotic actors” (Slocum, 2004, p. 418) who actively construct a specific narrative. The rise of the polar bear as an environmental icon for global change can further be linked to a shift in environmental images from landscape visualizations to a focus on macro fauna (Cosgrove, 2008). The strategic use of such “charismatic megafauna,” species that appear “cute and cuddly,” yet also “wonderfully large, real, and alive,” in conservation campaigns has been criticized for focusing the public's attention on single species while losing sight of the overall issue (Lousley, 2016, p. 706). Becoming an endangered species is a social process based

on and productive of different narratives (Carey, 2007). In this study, I try to show that the use of such “charismatic megafauna” is not arbitrary. Rather, the choice of the polar bear within climate change communication is based on a wider iconography of the (polar) bear in Western popular culture (Archibald, 2015) as well as on the conceptualization of polar regions as the “the ‘ends of the earth,’” and therefore well suited to representing imminent disaster (Cosgrove, 2008, p. 1877). This opens up the questions of what kind of icons polar bears can be, what they represent and what is left out in this representation.

Many studies on climate change communication have looked at visuals used in newspapers and news magazines (Joffe, 2008; Rebich-Hespanha et al., 2015) or on televised news programmes (Lester & Cottle, 2009). Other studies have looked at the strategies of NGOs (Slocum, 2004) or climate action campaigns (Manzo, 2010b). Fewer studies have investigated visual environmental communication in popular science magazines. Remillard (2011) reveals a tension between conceptions of nature as a resource and as a sublime entity in *National Geographic*, while Whitley and Kalof (2014) show how *National Geographic’s* visualizations portraying animals in remote regions reinforce the interpretation of climate change as remote problem. This scarcity of research is surprising as popular science magazines are important actors in climate change communication. Standing at the threshold between the scientific community and the mass media (Stöckel, Lisner, & Rüge, 2009), they select, recontextualize, and transform scientific knowledge while communicating to an interested and educated public that itself has a multiplier function within society (Born, 2016). The following paper aims at filling this research gap by looking at how polar bears were established as icons for climate change in *National Geographic*.

Material and methods

Case study

National Geographic, founded in 1888, is one of the oldest, most influential, and broadly read popular science magazines (Whitley & Kalof, 2014) with a global circulation of about 7.3 million issues (3.1 million¹ in the US). Called “America’s lens on the world,” the magazine fulfils an important educational role in creating national awareness (Lutz & Collins, 1993, p. 15). Renowned for its photographs, *National Geographic* has been termed a “generator of icons” (Hawkins, 2010, p. 1) due to its cultivation of pictorial imaginations and consequential influence on the public’s visual literacy and popular consciousness (Lutz & Collins, 1993). Because of its large audience, its educational role, and its focus on the visual, *National Geographic* is a highly interesting locus for investigating how climate change is communicated visually. Thereby it is important to consider how the magazine’s visual communication strategies are tied to the political culture of the US, where climate change is discussed very controversially (Jasanoff, 2011).

As part of a larger project on visual climate change communication in popular science magazines, I analysed all feature articles and accompanying images about climate change published in *National Geographic* between 1992 and 2012, thus covering the period of increasing media coverage of climate change (Bolsen & Shapiro, 2017). Using *The Complete National Geographic* DVDs I retrieved 30 articles, including over 300 images. Conducting content analysis (Bell, 2000) of these images, I realized that polar bears were by far the most depicted animals and a major persistent visual element in *National Geographic’s* climate change discourse. No other animal has been so continuously and recurrently associated with climate change. Thus emerged the question of how polar bears attained their iconic status in *National Geographic*. While articles that link climate change and polar bears are part of the overall sample of my larger project, for this paper I thus also considered articles published between 1992 and 2012 that focus primarily on polar bears. This enabled me to see if polar bears and climate change were always connected or when and how this connection was established. The analysed articles comprised 102 images, of which 72 depict polar bears (for a list of articles see [appendix, Table A1](#)).

Additionally, I conducted interviews with members of the editorial offices of *National Geographic*, among them photo editors, photographers, science journalists, and research staff. Although not in the focus of this article, these interviews were important for me to better understand the production processes and the overall framing of climate change within the magazine (see Born, 2017).

Multimodal critical discourse analysis

This study was conducted within the methodological framework of multimodal critical discourse analysis (MCDA) (Machin & Mayr, 2012). Discourses are defined as “context-dependent semiotic practices” which are both “socially constructed and socially constitutive” (Meyer & Wodak, 2015, p. 27) and can take visual, written, or oral form. The critical approach of MCDA is central to my analysis, as it stresses examining power relations, ideologies as well as absences and invisibilities (Meyer & Wodak, 2015). Within popular science magazines, images, maps, visualizations, and written texts create a multimodal impression. Therefore, it is necessary to consider the interplay between these different forms. Yet images also allow for multiple interpretations, and textual elements often serve to fix the images’ meaning, with other layers of meaning remaining implicit (Barthes, 1977). Especially in *National Geographic*, captions serve to “situate and construct the visual narrative” (Whitley & Kalof, 2014, p. 12), while latent meanings still impinge on the images’ role within the larger discourse. It is thus important to analyse pictures in their own right as well as in their interplay with written texts.

This was achieved by employing several distinct methods: In order to explore the multiple meanings of the images, I first isolated the images from any textual messages. I then used type-building (Müller-Doohm, 1996) to reduce the sample size, grouping all images into different image-types and then selecting prototypes for each image category. As a next step, I analysed each prototype, looking at composition, colour, point of view, and perspectives (Rose, 2016). Using visual semiotics, I further revealed the connotative meanings of the images—the “broader concepts, ideas and values” the images refer to (Van Leeuwen, 2000, p. 96). This step was aided by group interviews with peers (Rose, 2016), which offered new interpretations and helped me to critically question my own. Finally, I recombined visual and verbal elements to observe the interplay between the images and their context, paying attention to the communicative, cultural, as well as historical contexts of the images (Hansen & Machin, 2013). To further explore this aspect, I also employed visual situational analysis (Clarke, 2005).

Drawing together these analyses, I was able to identify three different phases within the overall visual discourse in *National Geographic*. These phases, though overlapping, display a temporal process, which I will explain in the next section.

A process of iconization

Polar bears were not always linked to climate change, but rather gained this connection through a continuous and changing visual discourse—what I have termed the “process of iconization.” This process took place over three distinct phases, each with a different visual style, which aligns with an uneven temporal distribution of different image categories. These categories and their temporal order in relation to the discourse phases are captured in Table 1. Phase 1 lasted approximately until 2004, phase 2 was present between 2004 and 2005, and phase 3 started after 2005 and lasted until the end of the observation period.

To illustrate the overall visual changes as well as semantic properties of the images, I will now discuss each phase along a representative prototype.

Anthropomorphized bears

In Figure 1 (published in January 1998), we see a bear resting on the ice, laying its neck on its paws. The bear looks calm, but also a bit sad, with its sagging jowls seeming to suggest this interpretation.

Table 1. List of image categories built upon the analysis of 72 polar bear images, including their temporal distribution throughout the discourse.

Image category	Description	Temporal distribution
<i>Family Idyll</i>	Close-ups of mother bears and their cubs; anthropomorphized depictions	Very present between 1998 and 2004, disappear after 2005
<i>Emotional Bears</i>	Close-ups of single bears seemingly expressing emotions; anthropomorphized depictions	More prominent between 1998 and 2004 but present throughout the discourse
<i>Dynamic Bears</i>	Pictures depicting bears conducting various activities (e.g. jumping, diving, play-fighting)	Play-fight pictures are prominent until 2004 but are then replaced with jumping, running or diving bears.
<i>Bears and humans</i>	Images where bears interact with humans or human artefacts.	Overall not a prominent category, more present between 1998 and 2004, disappear after 2005.
<i>Lost Bears</i>	Mostly landscape shots, showing the bears from further away; typically on ice floes or within Arctic landscapes.	First, single, appearance in articles from 2004 and 2005, become a prominent theme after 2007.
<i>Bears in Danger</i>	Images explicitly depicting danger for polar bears	Only present starting in 2007.

From today's perspective, it seems hard not to associate the image with climate change as polar bears have become so manifestly connected to the issue (Hansen & Machin, 2008). Interestingly, this image is part of a series of articles, published between 1998 and 2004 that was not primarily about climate change but rather focused on polar bears and only the beginning of the connection between polar bears and climate change. This connection is achieved through two parallel processes happening during phase 1.

First, throughout these articles, polar bears become increasingly linked to climate change although the issue itself is not (yet) foregrounded. Thereby the polar bear articles mirror the broader development of the climate change discourse in *National Geographic*. In May 1998 climate change features for the first time on the cover of *National Geographic*. In this article, the anthropogenic climate change is presented as rather uncertain and it will take until 2004, over the course of eight

**Figure 1.** Norbert Rosing/*National Geographic* Creative (1998).

feature articles, for climate change to be regarded as discursively established within the magazine (Born, 2017). Similarly, in an article on polar bears, published in January 1998 a polar bear researcher “wonders if climate change—including global warming, if that trend is confirmed—could be among the factors responsible” (Eliot, 1998, p. 64) for polar bears’ declining weight. Likewise in another article from 2000, climate change is only mentioned in passing as one possible threat to polar bears. This changes in the next article, published in February 2004, where climate change is described as a fact, which might be “tipping the balance” (Eliot, 2004, p. 36) for polar bears. Interestingly, in the very same issue, an article about the global carbon cycle finally draws a clear connection between the burning of fossil fuels and climate change (Born, 2017). Publishing these articles together further implicitly fosters the connection between polar bears and climate change.

Second, polar bears are depicted in an anthropomorphized manner, allowing readers to both identify with and emotionally relate to them, which is supported by a visual language displaying multiple close-ups of polar bears (Van Leeuwen, 2000). Next, to single bears seemingly expressing different emotions, many images focus on the “family-life” of the bears. Overall, the images make the polar bears appear almost human, both in displaying emotions and showing specific behaviours. This visual style of anthropomorphized bears refers to the iconology of the teddy bear, deeply rooted in American culture. The stuffed animal was invented after former US president Theodore Roosevelt spared a grizzly on a bear hunt and it borrowed the president’s name as a marketing strategy (Mooallem, 2013). This event also marked the beginning of a different relation to nature within US culture where wild nature no longer needed to be dominated but could be romanticized, pitied, and commodified (Cronon, 1996). Similarly, the anthropomorphized depiction of polar bears is only possible because of earlier changes in popular imaginations about polar bears. Starting with the 1980s and fostered through advances in scientific research on polar bears, their “image ... changed from frightening to helpless. ... Observers now saw a vulnerable beast whose survival depended upon scientists equipped with modern technology” (Archibald, 2015, p. 278). These changes in the polar bear’s popular image are also visible in the famous *Coca Cola* advertisements or the children’s book series *The Little Polar Bear* and show that polar bears were popular charismatic megafauna before being connected to climate change (Archibald, 2015). This is important for their later function as icons in climate change communication. Building on these wider connotations of polar bears, their anthropomorphized depiction in the first phase of the discourse allowed establishing them as subjects of identification.

Bears in context

The change in *National Geographic*’s overall discourse on climate change is also reflected in the emergence of a new visual language with regard to polar bears, the first traces of which can be seen in an article published in December 2005. In [Figure 2](#) we see a mother bear with her two cubs resting in the snow. In comparison with former articles, the colours are now colder. While the family theme is still predominant, the topic of protecting and sheltering emerges, as can also be seen by the title “Refuge in White.” The sow puts her paws around her offspring in a shielding manner and the cute, cuddly little bears themselves evoke protective instincts in the viewer. One of them appears to hide between its mother’s paws, a further reference to a shy little child. A treetop is visible behind the edge of the snow, pointing to the wider Arctic landscape.

This article displays a phase of transition in the (visual) discourse. While polar bears are still the focus of the article, they are now more visually and verbally connected to the Arctic ecosystem. Shots of bears from farther away begin to appear, portraying the bears as a part of the Arctic landscape. Also, images of other animals living in this ecosystem are included, as well as landscape shots. Climate change is now presented as an uncontested fact, and more textual space is attributed to the consequences that warmer temperatures and the earlier breakup of ice have for polar bears. This second phase of the process marks the emergence of a new visual language, which puts polar



Figure 2. Norbert Rosing/*National Geographic Creative* (2005).

bears in the context of their habitat. By connecting them to the endangered Arctic environment, they are anchored in new ways to climate change.

Bears in danger

The final phase of this process of iconization comprises articles on polar bears published in *National Geographic* after 2005, where the connection between the bears and climate change is well established. In **Figure 3** (published in June 2007) two bears seem lost or trapped on a floating iceberg and the image caption, stating that the bears have to swim longer distances due to disappearing ice, underlines the risk to the bears (see Whitley & Kalof, 2014).

This picture is representative of a series of images that display a completely different visual language in comparison to phase 1. As is also evident in the articles' titles (such as "Life at the Edge" or "On Thin Ice"), climate change is a major concern for all these later articles. While images of the "family-idyll" practically disappear, images now connotatively or explicitly display the danger the bears are in. Pictures of bears within their Arctic habitat become predominant, including the now-iconic images of bears seemingly trapped on an ice floe. A denotative shift in focus from the bears to the Arctic ecosystem is visualized by the inclusion of pictures of other animals or the Arctic landscape, which is also reflected in a decreasing proportion of polar bear images in these later articles (see **Table A1**). This shift also happens on a textual level, where the Arctic ecosystem is described as endangered by climate change. Displaying the bears within this habitat but also by calling them the "Icons of the Arctic" (Mcgrath, 2011, p. 72), the visual and verbal discursive connection between polar bears and the Arctic is reinforced. They become ambassadors of an endangered ecosystem, and through their function as subjects of identification, established in the first phase of the



Figure 3. Paul Nicklen/*National Geographic Creative* (2007).

process, they also become surfaces onto which individual suffering can be projected. Thus, the bears emerge as icons of climate change.

As a consequence of the shift from focusing on close-ups of the bears to portraying them in their surrounding landscape, the bears now appear less anthropomorphized (Van Leeuwen, 2000). The visual style of the final phase in the process of iconization refers back to the Victorian imagination of polar bears, when they were not portrayed as individuals but “conflated with their landscape” (Archibald, 2015, p. 269). Nevertheless, the subjectification of the bears is still entrenched in these images, which is important for the emotional anchoring (Höjjer, 2010) of climate change. Through gradually connecting polar bears to the issue of climate change, climate change is emotionally anchored to the already familiar polar bear, which enables identification while also evoking feelings of pity and protective instincts for the endangered animals (Huggan, 2016; Slocum, 2004).

Discussion: polar bears as climate change activists?

Hansen and Machin (2013) point out that “environmental images do not acquire iconic or representative status by themselves” (p. 156) but through an ongoing process, which draws on “an extensive collection of semiotic resources” (p. 157). By recounting and analysing the visual discourse about polar bears in *National Geographic*, I attempted to show how polar bears were gradually turned into icons for climate change and what cultural resources got inscribed into this icon.

This process of iconization took place over several years and happened in three phases, each of which displays distinct visual languages and visual signs. Throughout these phases, we can observe two opposed developments regarding the range of the visual discourse. From an earlier focus on the bears, the discourse visually zooms out to include the bears’ environment. First, images of anthropomorphized bears establish them as subjects of identification. Then, by showing the bears in the context of their (endangered) habitat, a connection is built between polar bears and the Arctic. Finally, showing how this connection puts the bears themselves in danger, they come to stand for

(the threats of) climate change. While the focus on the individual bear is diminished in favour of portraying the bear in the context of an Arctic ecosystem endangered by climate change, the discourse simultaneously zooms in on climate change as the primary danger to the bears. The iconic meaning of polar bears as representatives for climate change thus increases hand in hand with climate change becoming more and more discursively established within the magazine.

As a result, the tale of the bears creates a central theme in the magazine's larger climate change narrative. The bears become semiotic actors, playing an active part in the narrative's construction (Slocum, 2004). Reconnecting the bears to their surrounding landscape, as in the Victorian imaginations of polar bears (Archibald, 2015), connects the threatened Arctic to the viewer's own home. Thus, the icon of the polar bear localizes the global phenomenon of climate change to a specific place (Slocum, 2004) and further connects it to individual fate and suffering. In order to understand this localized and individualized account of climate change, I now want to discuss how the process of iconization is embedded in a specific cultural and political context as the "... effectiveness of icons depends on stories told around them, which operate in turn within larger discursive and ideological frames" (Huggan, 2016, p. 15).

The process of the polar bear's iconization represents and reproduces wider changes within US (political) culture and *National Geographic's* discursive environment. *National Geographic's* reporting on climate change takes place in an environment where the topic is discussed highly controversially (Jasanoff, 2011) and often linked to certain (political) ideologies (Stenport & Vachula, 2017). The controversies about climate change can be linked to a specific culture of decision-making, or "civic epistemology," where knowledge claims are tested through confronting different expert statements (Jasanoff, 2011, p. 135), which is also reflected in a media landscape that tends to over-represent the "uncertain science frames" (Bolsen & Shapiro, 2017, p. 4). In this controversial political landscape, polar bears served as climate change activists to put climate change on the political agenda: In 2005, environmentalist groups deliberately petitioned the government to include polar bears in the list of endangered species as part of the Endangered Species Act (Owen & Swaisgood, 2008), which happened with the underlying intention that by evaluating the bears' status, the Bush administration would be confronted with climate science and eventually have to admit the reality of climate change (Mooallem, 2013). As an institution that generates and disseminates public knowledge statements (Jasanoff, 2011), *National Geographic's* use of polar bears thus reflects and contributes to these wider cultural developments. Establishing polar bears as icons of climate change can be seen as a strategy to personalize and individualize the topic at a time when interest in ecosystem-based environmentalism was in decline in the US (Shellenberger & Nordhaus, 2007).

While the polar bear as icon was built up within a specific discursive and cultural setting, scientific factors were equally important for this development. Scientific studies show that polar bears are indeed endangered by the loss of their habitat due to the shrinking of sea ice caused by climate change (Owen & Swaisgood, 2008). These studies are crucial, as they make it possible for *National Geographic* to use polar bears in their climate change reporting. Following a self-imposed credo of "scientificity," *National Geographic* claims to base stories on original scientific research (Born, 2017). Without research on the endangerment of polar bears, they could not have become an icon for climate change within the magazine. This points to a wider problem regarding visualizing climate change as once its impacts can be shown, its communication comes too late (Doyle, 2009). Thus, the icon of the polar bear is connotatively right but denotatively misleading: While the image of the polar bear on the ice floe, in fact, does not depict any immediate danger for the bear, nevertheless, the wider scientific claim it implies holds.

Many of the characteristics Lucaites and Hariman (2001) use to describe distinct photojournalistic icons also apply to the generic icon of the polar bear: Photographs of polar bears are widely reproduced in different media when it comes to climate change and, therefore, also easily recognized as representations of the issue. Furthermore, they (are meant to) produce strong emotional responses in the viewer. Hariman and Lucaites (2007) further discuss the dialectic character of such icons as they are (re)producing ideology but also providing tools for reflexive awareness. The icon of the

polar bear certainly holds diverse and contradicting meanings. In the next section, I discuss this dialectic character in more detail as well as further implications of using the icon of the polar bear in climate change communication.

Conclusion: the dialectic character of polar bear images

Analysing the process of iconization of polar bears in *National Geographic* reveals an emotionalized account of individual suffering. First, the bears are put in the context of their habitat and then put in danger due to climate change. Over time, readers can gradually perceive new facets of the bears, so that the bears come to appear as affected witnesses of global climate change. Because the bears are anthropomorphized subjects of identification, their misery and sorrow function as a stand-in for humanity's problems and the drifting ice floe becomes a metaphor for earth's vulnerability. What characterizes polar bears' iconicity is that they enable multiple identifications: "Polar bears are both surrogate humans and unmistakably themselves" (Huggan, 2016, p. 16). The icon of the polar bear thus allows personalizing the abstract and temporally remote issue of climate change. Linking polar bears to the Arctic, the icon enables to localize this global phenomenon (Slocum, 2004) and, further, allows visualizing its effects and consequences. Thus, the icon fosters identification with an endangered species, provides "public proof" for climate change and allows raising awareness for this timely matter.

However, the icon of the polar bear also entails a certain "gaze" that focuses on specific things while making others invisible. In line with western imaginations about the Arctic as a "blank space" (Stenport & Vachula, 2017, p. 290), humans are conspicuously absent within these iconic images. Those people who are actually living in the Arctic and for whom polar bears are part of their lived reality are silenced through their absence in those images. The focus on the polar bear as the charismatic species associated with the Arctic also draws attention away from other animals living in these environments (Lousley, 2016). On a connotative level, the icon of the polar bear is meant to represent humanity. Yet, "to speak for others is to first silence those in whose name we speak" (Callon, 1986, p. 216). The abstract conceptualization of humanity impersonated by the lone bear on the ice floe does not give voice to the many people already affected by climate change. Furthermore, the symbolic connection of climate change with Arctic environments makes the many other places where climate change can be perceived invisible. The individualized as well as the localized account of climate change put forward by the icon of the polar bear further conceals the uneven global distribution of power, cause, and affectedness regarding the issue. Thus, the focus on polar bears as representatives of climate change does not foster awareness for environmental (in)justice, obscures "the humanistic dimension of the crisis" (Dunaway, 2009, p. 10) and makes the fate of other (human and non-human) species, both living in the Arctic or elsewhere, invisible.

The concept of the "gaze" also draws attention to the power relations inscribed into the practices surrounding imaging. Hunting wild animals was replaced by hunting for their pictures, yet the "photographic gaze" still contains an act of domination over nature (Haraway, 1984). While the viewer is "in control of seeing" (Clarke, 2005, p. 210), the polar bears are "captured"—put in specific places and situations—and objectified through the photographs. As the use of the icon is justified through scientific observations of the bears (Archibald, 2015) they become passive victims of human activity (Slocum, 2004). The icon of the polar bear thus reflects and reinforces the radical modern divide between nature and culture (Latour, 1993) by representing nature as external and removed from the social worlds (Slocum, 2004). The polar bears become "charismatic victims" (Slocum, 2004, p. 428), romanticized, anthropomorphized, in need of human help and, therefore, deprived of agency (Haraway & Goodeve, 2000).

Thus, the ideological function of the icon of the polar bear becomes visible: while seemingly presenting "objects as they are in the world" it places the viewer and the viewed "within a system of social relationships" (Hariman & Lucaites, 2007, p. 2). The anthropomorphized depictions of the bears reflect social conditions, relations, and imaginations of affectionate motherhood, loneliness,

or vulnerability. The icon of the lost bear on the ice floe evokes the notion of the lonesome cowboy and the myth of the final frontier (Cronon, 1996). This explains, on the one hand, the icon's success and effectiveness since it enables identification with the bears as witnesses of climate change and offers a projection surface for human suffering. On the other hand, this also shows the limitations of the icon for raising wider environmental awareness as through romanticizing nature, nature's domination is obscured (Haraway & Goodeve, 2000). Furthermore, the icon fosters an individualized and localized understanding of climate change, which conceals the wider conditions of production into which nature and humans are enmeshed and visually disconnects from "concrete processes, such as global capitalism" (Hansen & Machin, 2008, p. 779). In depictions of the vast, cold Arctic landscape, nature appears as exotic and removed from the social sphere, which inhibits linking human and natural problems (Whitley & Kalof, 2014). The icon reproduces the power structures and ideologies within which it is entangled but does not make the wider circumstances or causes of climate change visible (Hansen & Machin, 2013). A broader and more diverse visual repertoire, which would include the causes and complexities of climate change as well as the contingency of these conditions, could open up debates and foster imaginations of change. A visual communication of climate change that relies solely on individual suffering and emotional concern runs the risk of hiding the social and political complexities connected to this issue and makes imagining fundamental systemic changes that much harder.

Note

1. <http://abcas3.auditedmedia.com/ecirc/magtitlesearch.asp>

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Appendices

Table A1. List of all articles on polar bears or polar bears and climate change published in *National Geographic* between 1992 and 2012.

Title & Subtitle	Author	Photographer	Year and month published	Images: Total/polar bears
Polar Bears. <i>Stalkers of the High Arctic</i>	John L. Eliot	Flip Nicklin	January 1998	19/18
Bear Beginnings. <i>New Life on the Ice</i>	Norbert Rosing	Norbert Rosing	December 2000	16/15
White on White. <i>Polar Bears</i>	John L. Eliot	Norbert Rosing	February 2004	19/18
Refuge in White. <i>Winter in a Canadian National Park</i>	John L. Eliot	Norbert Rosing	December 2005	8/3
Life at the Edge. <i>On the frontier of a frozen ocean, rising temperatures imperil wildlife whose survival depends on ice</i>	Paul Nicklen	Paul Nicklen	June 2007	17/5
Ice Paradise. <i>The rich life of Svalbard, Norway's Arctic archipelago, faces a creeping thaw</i>	Bruce Barcott	Paul Nicklen	April 2009	15/6
On Thin Ice. <i>The Arctic is warming so fast that by 2050 it may be largely ice free in summer. Without their frozen hunting platform, how will polar bears survive?</i>	Susan Mcgrath	Florian Schulz	July 2011	8/7