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ARTICLE

Defining a visual metonym: A hauntological study of polar bear imagery in climate communication

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Abstract

From television news bulletins, newspapers and magazines, documentaries and films, social media memes and cartooning, to protest and art – even to the images that spontaneously come into our minds – polar bears are now ubiquitously associated with climate change. Indeed, polar bear visuals now often mean nothing but climate change. Why do polar bear images, as a particular type of climate change imagery, continue to thrive and to circulate – and indeed, to haunt – our imaginings of climate change? This paper seeks to understand the tangled social, cultural, political, and scientific histories of polar bear visuals through defining a new concept, a 'visual metonym'. This concept is worked through using a longitudinal analysis of visual evidence arising from political, social, scientific, and cultural domains and using a hauntological approach that is sensitive to the spectre-like nature of polar bear imagery. This reveals three periods in which the work that polar bear visuals has undertaken has changed: polar bear (1990s–mid-2000s), political bear (mid-2000s), and climate bear (mid-2000s onwards). By the time of the 'climate bear' period, polar bear images had become entrenched and irreducible from (i.e., they haunt) climate change. As polar bear images came to stand in for much wider debates – of climate scepticism and political (in)action – they became a visual metonym. The paper concludes by presenting the visual metonym concept as a way to explore and understand how particular image types gain power, agency, and meaning and how they come to act as signalling devices representing complex engagements with contemporary issues. The visual metonym concept can be used to understand, interrogate, and critique naturalised and pervasive issue-led imagery.

KEYWORDS

climate change, communication, engagement, image, polar bear, visual metonym

1 | INTRODUCTION

This paper is concerned with the visualisation of climate change through one of the issue's most enduring visuals: the polar bear. Scientists began to warn of the threat to polar bears from anthropogenic warming impacting sea ice habitat from the early 1990s onwards (e.g., Stirling & Derocher, 1993). Since this time, Arctic sea ice loss has declined faster than most climate models predicted. In 2015, the International Union for the Conservation of Nature (IUCN) put polar bears on the red list, the first time a species was listed as threatened due to climate change. This listing was a culmination of the scientific recognition of the impact of anthropogenic warming as the single most important threat for the survival of the species.

Polar bears have become the 'poster child' of climate change (Garfield, 2007). Bear images feature heavily in NGO campaigns, news media, and filmic and artistic renderings. A diversity of polar bear imagery is examined to seek to understand the evolution of polar bear visuals over time, and what this means for a broader cultural politics of climate change.

This paper utilises Roberts' (2012) hauntological approach to study polar bear images. This is situated within the ongoing shift in cultural geography in using the notion of 'representations-in-relation' (Anderson, 2019). A hauntological approach theorises that images, like ghosts, have an 'in-between' status: they haunt (i.e., they slide in and out of) both representation and presentation, material object and the imagination, visible and invisible, real and virtual. Yusoff and Gabrys (2011) write of how particular types of climate imagery – for example, of refugees and of the Arctic – come to embody (to haunt) our imagination of climate change and, from this, how certain types of climate imaginary come to be normalised. Hore (2022) focuses on the specific power of landscape photography in shaping settler colonialism. Hore brings together a collection of late 19th-century landscape photography to show how colonial visions of nature (as empty and wild, without Indigenous presence) were formed onto film in remarkably stable ways across geographical contexts, making these settler images hauntingly familiar then, and still working to haunt colonial power relations now.

Using the concept of haunting can be analytically productive, as the tensions of material object/imagination, visible/invisible, and real/virtual are held together to examine both presentation and representation, recognising the inevitable movement that visual image work brings. Focusing on image movement is a key part of geographical visual work: for example, Rose (2016, p. 334) calls for geographers to move away from the study of stable cultural objects, and instead focus on understanding interfaces, networks, and friction, especially as images travel across now all-pervasive digital technologies. The importance of understanding visual movement is also recognised in broader interdisciplinary climate visual work: Schneider and Nocke discuss how climate images 'migrate from one sphere to another. They might keep their basic gestalt, but as picture agents, they are able to serve various interest groups, trigger different associations and offer new perspectives' (Schneider & Nocke, 2014, p. 17).

The hauntological approach used here recognises that with each viewing – or haunting – polar bear images perform as complex and evolving parts of 'an assemblage of signification, material objects, affects, multisensory elements and context' (Roberts, 2012, p. 397). This paper is interested in what polar bear images 'can do: their power, "agency" and meaning, and our responses to them' (Roberts, 2012, p. 387). How do polar bear images work across the tensions of the visible and invisible, real and virtual, as material objects and as abstract embodied understandings? Why do polar bear images flourish, reproduce, thrive, and circulate? Why do polar bear images persist in having significance (why do they continue to haunt) our visual imaginings of climate change?

To investigate these questions, theoretical concepts from semiotics (the study of signs and symbols for communication) and rhetoric (the study of writing or speaking in communication) are used. Both rhetoric and semiotics are used to understand meaning in polar bear imagery, and movement in meaning over time. Semiotics (Peirce, 1931–35, 1958) seeks to understand how a sign – a stimulus pattern – has meaning, which can be attached in different ways. One way is as an icon, where a form physically resembles what it represents, e.g., a photograph of a polar bear clinging to an ice floe in a vast ocean depicts the threat of melting ice. Conversely, when meaning is attached as a symbol, there is no direct relationship between the sign and the signified meaning, so the meaning of the symbol must be culturally learnt – e.g., a close-up photograph of a polar bear winking alludes to climate change scepticism. I show how polar bear imagery has moved over time from Piercian semiotic icons to symbols.

More broadly, this paper makes use of the rhetorical concept of metonymy and applies it to the study of visual imagery. Metonymy is closely connected to synecdoche, so it is helpful to discuss them both here. Both metonymy and synecdoche account for the relationship between a representation and the way in which it performs work in the world. While synecdoche is commonly understood as 'being based on a part-whole relationship', metonymy is 'based on a wider set of relations … directly linked in real or conceptual space' (Nerlich, 2019, np). So, polar bear imagery as visual synecdoche

encapsulates the impacts of climate change on polar bears, as an illustration of the much wider impacts of climate change. Or, polar bears as visual synecdoche implies that one polar bear image visually represents the impact of climate change on the whole species (see O'Neill, 2020). Increasingly though, polar bear images have come to act as a visual metonym by conceptually standing alone to act as a signalling device representing an engagement (including a critique) of climate science or policy. A visual metonym is therefore defined here as: A type of visual shorthand (used within a particular culture) which goes beyond the immediately represented denotative content to directly link to a set of ideas in real or conceptual space. In turn, the visual metonym itself can then become indistinguishable from the (often deeply political) judgements with which these ideas are associated.

This paper uses the concept of the visual metonym to show how it can be used a way to question and explore the inter-relational work polar bear images do in the world.

2 | METHOD

Visuals are broadly defined here to include material objects 'out there in the world' as well as 'in our heads' or our imagination (Cosgrove & della Dora, 2008, p. 8). Rose states that visual scholars must now contend with the profound changes brought about through digital technologies by considering the massive quantity of images circulating, the mutability of these images, and their multimediality and, in doing so, 'plunge into the popular, the mass ... the prosaic and the silly' (Rose, 2016, p. 346). Thus, the diversity of visuals examined here includes photographs from newspapers and TV, adverts, cartoons and protest imagery, mutating and ephemeral memes and other imagery circulating online, and the 'top-of-mind' imagery in our imaginations (see Leiserowitz & Smith, 2017). It examines the work of polar bear imagery – how people are moved, changed, or otherwise affected (Anderson, 2019) – in relation to the wider cultural, political, and scientific climate context. It is concerned with 'understanding what people do with images and, conversely, how images do things with people – move, inspire, leave them cold, and so on' (Anderson, 2019, p. 7).

Three types of data are brought together. First, I bring together data from many other projects I have undertaken, but where polar bear imagery has been a continuous spectre. An interest in polar bears began during my PhD work, when they were mentioned as a climate icon by non-experts during both survey and focus group studies (O'Neill & Hulme, 2009). This led to an expert elicitation specifically seeking to understand polar bear population dynamics (O'Neill et al., 2008). But polar bear visuals have continued to haunt my research in climate communication: from investigating how visuals, including polar bears images, affected people's feelings of saliency and efficacy on climate change (O'Neill et al., 2013; O'Neill & Nicholson-Cole, 2009) to tracking and understanding climate images, including polar bear images, in the news media – across nations (O'Neill, 2013) and over time (O'Neill, 2020); to an examination of visuals for climate change engagement, with a focus on polar bears (O'Neill, 2017). Second, this paper brings together a diverse literature examining polar bears, visuals, the imagination, and climate engagement (including Born, 2018; Doyle, 2011; Huggan, 2015; Manzo, 2010; O'Neill, 2013; Slocum, 2004; Swim & Bloodhart, 2014; Tollman, 2014). Third, it includes visual polar bear 'visual artefacts' I have collected over more than a decade.

The paper now presents a longitudinal examination of polar bear visuals over three decades (Figure 1) to follow the evolution and movement of the polar bear into a visual metonym. The discussion then widens out and problematises the visual metonym concept. The paper concludes by examining what it means if, by becoming a visual metonym, polar bear imagery has moved from being associated with climate change to being reduced to nothing but climate change.

3 | THE EVOLUTION OF POLAR BEAR IMAGERY

3.1 | Polar bear (1990s–mid-2000s)

From the 1990s into the mid-2000s, polar bear images were just beginning to be explicitly linked to climate change, as part of their journey to becoming a visual metonym. Polar bear images were not particularly common in public discourse.

In the early 1990s, photographer Norbert Rosing took a series of playful photographs of a wild polar bear frolicking in the snow with a domestic husky. These were used by the magazine *National Geographic* in an article 'Animals at Play'. But audiences were far from reading the images as cute and cuddly, as intended. Instead, they were enraged, accusing Rosing of endangering the life of a dog by placing it in the path of a dangerous predator. The link between climate

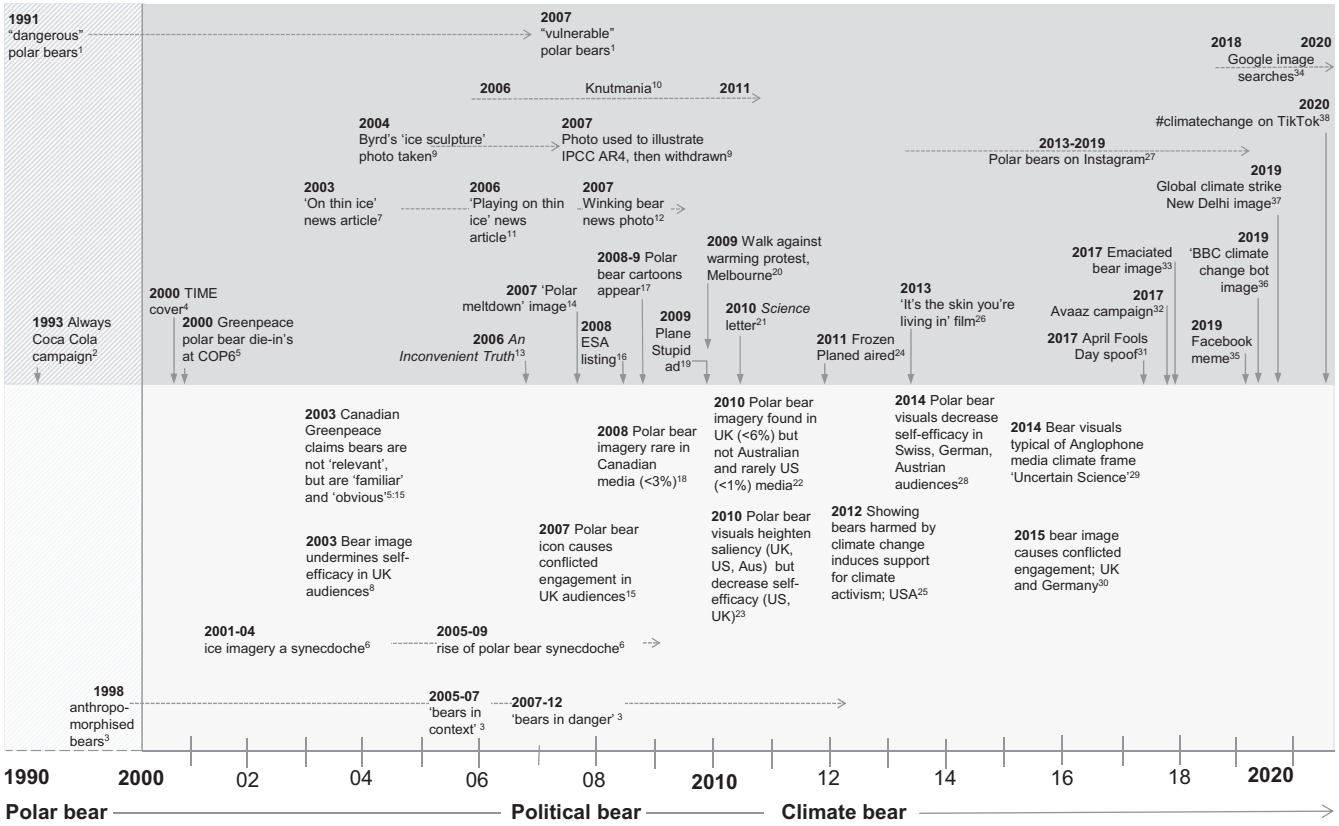

FIGURE 1 Timeline of polar bear visuals. The figure is to scale, except the compression between 1990 and 2000 (hashed area) and the placement of the polar bear/political bear/climate bear timeline labels, which are indicative rather than exact. For popular culture items (dark grey box, top), years refer to the date images or articles were first published, won awards, or otherwise achieved notoriety. For scholarly items (light grey box, bottom), years refer to the date when data were collected (often several years before publication). References as follows: [1] Krulwich (2014), [2] Coca-Cola (2021), [3] Born (2018), [4] TIME (2000), [5] Slocum (2004), [6] O'Neill (2020), [7] News article (author data, see text), [8] O'Neill and Nicholson-Cole (2009), [9] ABC (2007), [10] Engelhard (2016), [11] News article (author data, see text), [12] News article (author data, see text), [13] Guggenheim (2006), [14] Nævra (2007), [15] O'Neill and Hulme (2009), [16] CBD (2018), [17] Climate cartoons appear (author data, see text), [18] DiFrancesco and Young (2011), [19] Mother (2009), [20] Walk against warming protest photo, see Figure 3a, [21] Gleick et al. (2010), [22] O'Neill et al. (2013), [23] O'Neill et al. (2013), [24] BBC (2019), [25] Swim and Bloodhart (2014), [26] Harradine (2013), [27] Lam and Tegelberg (2020), [28] Metag et al. (2016), [29] O'Neill et al. (2015), [30] Corner et al. (2015), [31] Piaf (2017), [32] Wang et al. (2018), [33] Mittermeier (2018), [34] Google image searches, author data, see text, [35] Green New Deal (2021), [36] BBC (2019), [37] RTE (2019), [38] Jelley (2021)

change and bears was not evident in public discourse at this point; for example, it was not (yet) discursively established in *National Geographic* articles (Born, 2018).

Scientists began to publish papers on the potential threat to polar bears from climate change (e.g., Stirling & Derocher, 1993). From 1993 onwards, the anthropomorphisation of polar bears was given a notable boost through Coca-Cola's international advertising. Although Coca-Cola had sporadically used polar bears in advertising as early as 1922, they came to the fore through the 'Northern Lights' series beginning in 1993. These ads depicted computer animations of a polar bear family enjoying various activities, always sipping a Coca-Cola. Polar bears have gone on to be one of Coca-Cola's most popular symbols (Coca-Cola, 2021).

At the turn of the century, polar bears were just beginning to be explicitly linked to climate change in the public arena. In 2000, the front of *TIME* magazine featured a polar bear on the edge of an ice shelf with the caption 'Arctic Meltdown: This polar bear is in danger, and so are you' (TIME, 2000). Environmental NGOs – first Greenpeace in England, then Greenpeace Canada – had started to use polar bear costumes in climate change campaigning, finding the bears an effective way of generating media coverage (Slocum, 2004). Peter Tabuns, then Executive Director of Greenpeace Canada, said that the polar bear is a 'simple, emotional symbol ... people identify with the polar bear ... it will matter to them' (in Slocum, 2004, 14). Dramatic 'die-ins' of campaigners in polar bear costumes were a feature of climate protest at the

Sixth Conference of the Parties (COP6, 2000) well exemplifying the dead/alive relevant work undertaken by polar bear imagery.

Media analysis shows that while ice visuals were common in UK newspaper stories about climate change before 2004, polar bears did not routinely feature until 2005 onwards (author data, Figure 2). The visual trope of Polar Regions as distant and vast, and also white, pristine, wild, and untouched, is well established in (at least) the Western imagination. Humans are 'conspicuously absent' from this Western gaze onto the 'blank space' of the Arctic (Born, 2018, p. 11; Stenport & Vachula, 2017, p. 290). This visioning of Polar Regions renders them inaccessible and pure, with the snow and ice blanketing the landscape reinforcing associations of moral purification (Cosgrove & della Dora, 2008). Polar Regions are represented as existing spatially, temporally, and for civilisation at the 'ends of the earth', i.e., they act as 'eschatological' landscapes, where 'apocalypse can be easily imagined' (Cosgrove & della Dora, 2008, p. 5). They are also images that visually represent climate change as something distant in both time and space (O'Neill, 2013) and where they are often read as removing any sense self-efficacy from the audience (Metag et al., 2016; O'Neill et al., 2013; O'Neill & Nicholson-Cole, 2009). During this period, newspaper headlines and image captions used idioms and metaphors to imagine the Arctic as eschatological: for example, 'On thin ice' (*Telegraph*, 2003, author data) and 'Playing on thin ice' (*Daily Mail*, 2006, author data; see also O'Neill, 2020); but bears themselves were absent, were not yet routinely part of this imagination.

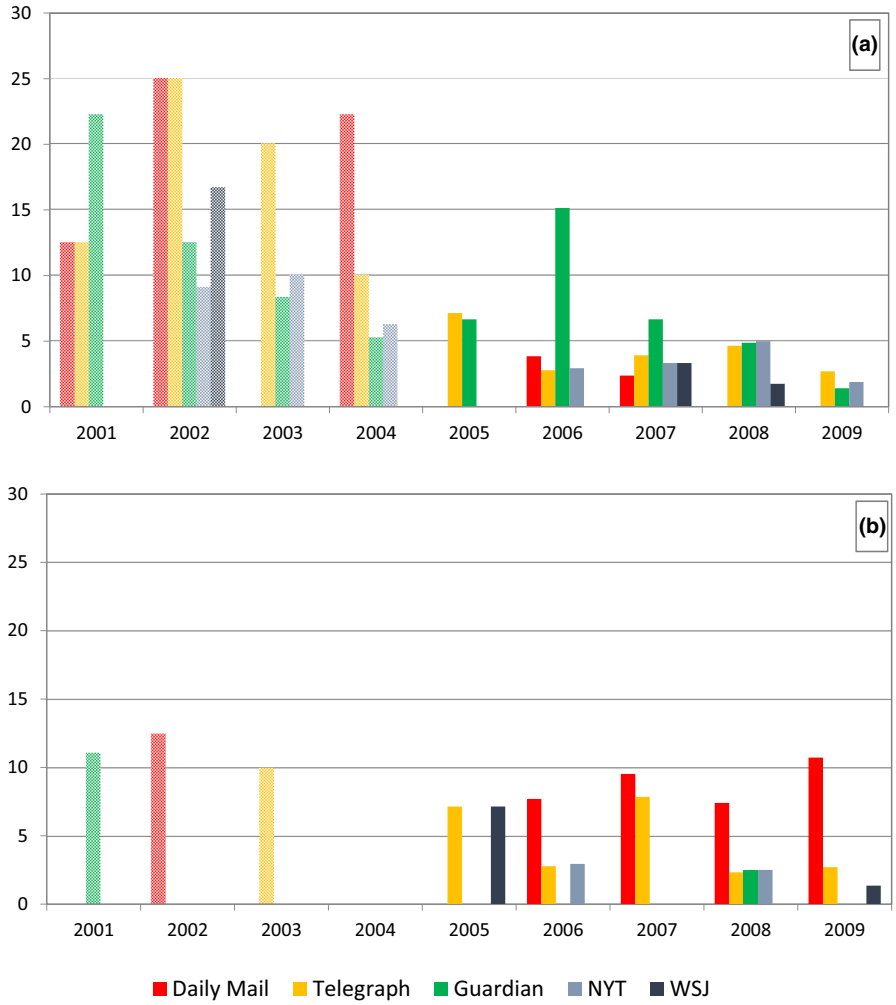

FIGURE 2 Visuals attached to climate change news articles over time in UK newspapers for (a) ice imagery and (b) polar bear imagery. Note that pre-2005 data are lightly shaded, to emphasise that the low numbers of visuals before this time can have a disproportionate effect on the appearance of trends

3.2 | Political bear (mid-2000s)

Significant changes were afoot, however, from the mid-2000s. From this point, polar bear images played a role in both cultural and formal politics. But while bear images were now connected to climate change, they were not yet a visual metonym – they were not yet irreducible to climate change.

The US-based Centre for Biological Diversity wrote a petition in 2005 calling for polar bears to be listed under the US Endangered Species Act (ESA). With other NGOs, they filed suit, forcing the US administration to take action. In 2006, the US Department of Interior directed the US Fish and Wildlife Service to investigate the issue. On 14 May 2008, polar bears were listed as 'threatened' under the ESA (CBD, 2018). While some cheered the ESA listing as a potential avenue to legal redress to reduce carbon emissions, President George W. Bush was clear that it was 'never meant to regulate global climate change' (Bush, 2008, np). Polar bears were dubbed 'the most political of animals' (Owen & Swaisgood, 2008, p. 143). They began to haunt and disrupt a linear temporality of extinction, the notoriety of bears increasing with their status as almost-dead (see Maddern & Adey, 2008). Alongside this politicisation through the EPA process, a potent combination of other cultural-political events influenced how the polar bear began to be linked to climate change from the mid-2000s.

Al Gore's Oscar, Academy Award, and Nobel Peace Prize-winning 2006 film, *An Inconvenient Truth* (AIT; Guggenheim, 2006) features an animation of a polar bear swimming in a vast ocean, towards a tiny ice floe. The bear struggles to climb on, but the floe splits in two. The bear tries again, and the floe breaks again. The bear pushes the floe away and the scene pans out to a vast ocean, devoid of ice. Meanwhile, Gore narrates how the animals are in danger because of climate change. The film, and this piece of bear imagery, works on two levels. It is clearly a filmic experience which has drawn viewers in: AIT was the 13th highest grossing documentary in the USA to date (IMBd, 2021), and the polar bear clip certainly provided an emotional and dramatic mini-drama within the film. But AIT also had an explicitly political purpose, in that it was designed to inspire viewers to go and spread the film's message. This is evident through the AIT's otherwise odd format choice (PowerPoint slides), and in how these formed part of a package of materials to support attendees of a training programme for climate campaigners, the Climate Leadership Corps (Pearce & Nerlich, 2018). Polar bears were linked to climate change politics on the streets, too, such as in the Walk Against Warming march in Melbourne, 2009 (Figure 3a).

Visuals of a polar bear cub, Knut, also helped cement the link between bears and climate change, in both cultural and formal politics. Knut was an orphaned polar bear born in captivity in Berlin Zoo in 2006 (Engelhard, 2016). Knut generates Berlin Zoo up to an estimated £7m (Connolly, 2007) in what became known as 'Knutmania' (Engelhard, 2016). Knut featured on the second annual Green Edition front cover of Vanity Fair (2007). In 2008, Knut was adopted by the German Environment Minister as the mascot for a climate change campaign and the German government issued a stamp with a picture of Knut urging people to preserve nature (Engelhard, 2016). Knut died unexpectedly in 2011, inducing a state of national anguish (Huggan, 2015).

By the mid-2000s, polar bears began to be visually connected to climate change in other fora, too. In *National Geographic*, bears began to be more connected to the Arctic ecosystem between 2004 and 2005, and from 2005, they were explicitly connected to climate impacts (Born, 2018). News and popular science media analyses show a rise in polar bear visual depictions at this time, a trend which is particularly marked in the UK: polar bear visuals averaged between 2% and 6% of climate visual news coverage during the period 2000–2010, with some years in specific newspapers in later years achieving over double that quantity of coverage (O'Neill, 2013, 2020; Figure 1). Polar bears were rarer in North American news media coverage, featuring in <1% of total visual coverage in US newspapers during the period 2000–2010 (O'Neill, 2013, 2020) and <3% in Canadian newspapers during 2008 (DiFrancesco & Young, 2011). During this period, polar bear imagery was denotatively linked to text directly about polar bears, e.g., 'Polar bears face starvation as global warming delays the hunting season' (*Daily Mail*, 2006) and 'Agency proposes to list polar bears as threatened' (*New York Times*, 2006; all author data). From 2005–2006 onwards, polar bears formed part of the visual lexicon of (Spanish) TV broadcasting of climate change, acting as one of a limited set of visuals that quickly and easily signified climate change (León & Erviti, 2013).

A polar bear clinging to a tiny ice floe achieved widespread recognition when it was awarded runner-up in the Shell 2007 Wildlife Photographer of the Year. 'Polar meltdown' (Figure 3b) was photographed by Arne Nævra near Svalbard, in the Norwegian Arctic. The instability of the bear on the floe conveys a sense of urgency, as if it is visually portraying the idiom 'hanging on for dear life'. The bear looks directly at the viewer, compelling them to acknowledge the situation. Nævra's image depicts an Arctic environment of white ice, but also an expanse of blue-grey water. The ice is shaped into intriguing sculptural forms partly through the process of melting. What is missing from the image is just as instructive:

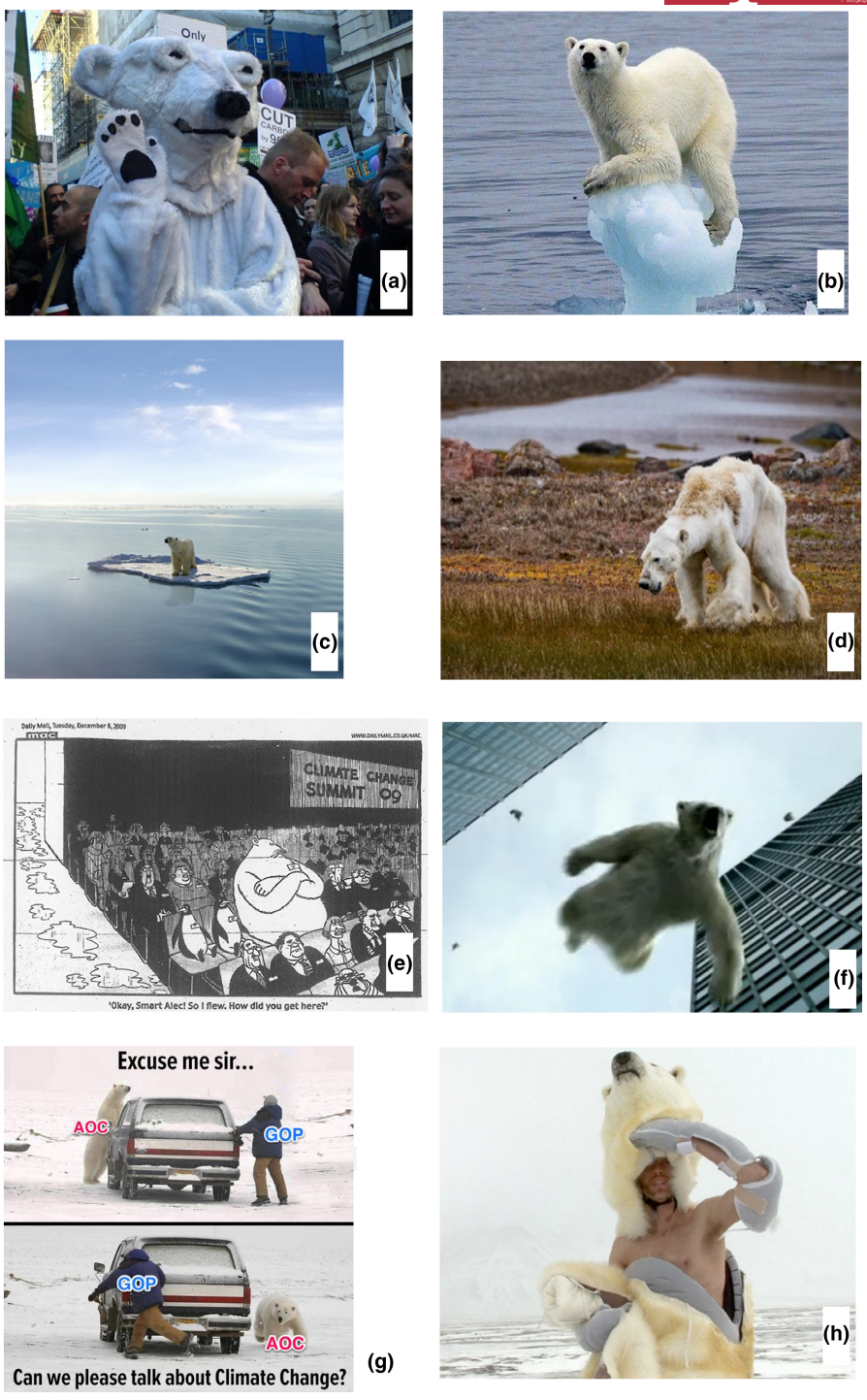

FIGURE 3 Panel of popular culture polar bear imagery. (a) Walk against warming protest march, Melbourne, author photo, 15 November 2009. (b) 'Polar Meltdown' (Arne Nævra, 2007). (c) Photoshopped polar bear image used alongside letter in *Science* (Gleick et al., 2010). (d) 'Emaciated bear' image (Mittermeier, 2017). (e) Early polar bear climate cartoon (*Daily Mail*, 8 December 2009). (f) Still from Plane Stupid campaign video (Mother, 2009). (g) Polar bear climate meme (Facebook, 18 April 2019). (h) Close-up from It's the skin you're living in website (Harradine, 2013)

the bear is white, pure (there is no blood evident, for example from a recent seal kill). This visual grammar of a bear on ice surrounded by dark water became common during this period (Born, 2018; O'Neill, 2020). The snow and ice in the images play to the cultural allusion of the Arctic as pure and vast, but construct a jarring reality by introducing the dangerous aspect of meltwater. Despite being distant and wild, even here, humanity is impacting the environment. The polar bear then adds to the drama of the allusion, as they are juxtaposed onto the melting Arctic imagery: connotations

of wildness, human impact, and danger are all implicit. Simultaneously then, this photograph symbolises the white, untouched North and the innocence and fragility of bears, but also a distant but threatening anthropogenic influence. The bears are co-opted and anthropomorphised into the visual narrative to represent an overwhelming threat to humanity (Huggan, 2015).

As the link between climate change and bears became widely established, people also started to change in how they responded to polar bear images. Rosing's same photographs of a husky and polar bear (discussed earlier) re-appeared afresh, 13 years later. This time, rather than rage, they induced a completely different audience reaction. People responded with compassion for the poor, endangered polar bear who 'only needed to hug someone' (Krulwich, 2014, np). In a UK study, participants spontaneously mentioned polar bears when asked for the first images that came to mind when thinking about climate change (O'Neill & Nicholson-Cole, 2009). Polar bear images had begun to be connected to climate change in people's imaginations.

3.3 | Climate bear (mid-2000s onwards)

From the mid-/late 2000s, climate scepticism increased (Capstick et al., 2015). Simultaneously, polar bear conservation science was also subject to uncertainty and controversy: populations have (or historically, had) been stable or growing, at least in some areas (O'Neill et al., 2008; PBSG, 2019). For example, zoologist Susan Crockford has been a vocal critic of polar bear population projections under climate change (Crockford, 2021). Others, such as lobby group the Global Warming Policy Foundation, have levied accusations of misleading claims about polar bear populations under climate change (e.g., GWPF, 2019). Thus, engagement with polar bear visuals became much more complex during this period. By the end of the 2010s, polar bear images had become obdurate, a stubbornly persistent visual representation of climate change (Maddern & Adey, 2008). Polar bear images became irreducible from climate change: they had become a visual metonym.

3.4 | Truth and objectivity

Engagement with polar bear visuals became contentious from the mid-2000s and into the 2010s. As images are effective vehicles for highly ideological encounters, so concepts such as truth and objectivity become complex and tangled (Mahoney, 2015). The notoriety of an image's provenance (Perlmutter, 1998) can therefore become important for the way in which an image is encountered. Visuals have often been used in an attempt to persuade people of the 'proof' of climate change, or to invite them to 'bear witness' to a changing climate (Doyle, 2011). The notoriety of an image's provenance is then particularly powerful for climate change images. This is because calls for action on climate change are frequently posed in terms of scientific accuracy and truth-telling, in an age of misinformation and denial (e.g., Cook et al., 2016). Therefore, if an image's provenance is deemed untruthful or deceptive, then it can (be seen to) cast doubts on the entirety of climate change.

In 2004, Amanda Byrd was a student on a summertime scientific cruise in the Beauford Sea. She spotted some polar bears and took a photo. Byrd captioned it 'mother polar bear and cub on interesting ice sculpture carved by waves' ('ice sculpture', here). It depicts two polar bears standing on an ice floe. The image is compelling in several ways. The ice floe has a sculptural quality to it, in that it has been weathered to produce a striking shape that is bridge-like and fragile. The way the two bears are perched high up on the edge of this delicate, floating ice structure constructs a sense of danger. The bears are standing up, looking out beyond the viewer, watching expectantly. Byrd passed a CD of images to Dan Crosbie, for personal use. However, Crosbie passed the image to Environment Canada, who in turn passed it to news agencies including Associated Press (AP). Several years later, AP released the image to coincide with the publication of the IPCC's 2007 Fourth Assessment Report (AR4). From there, 'ice sculpture' was picked up by major news agencies to illustrate the AR4's release, and was also allegedly used by Al Gore in the Inconvenient Truth lectures (Byrd, in ABC, 2007). AP attached a caption to the image about global warming and melting ice and said they had received it from a Canadian ice authority (Breen, in ABC, 2007). Throughout, the image was credited to Crosbie rather than Byrd. An outcry occurred once Byrd became aware of the unauthorised use of her image, and it was quickly pulled from many news stories. The use of the image to illustrate climate change was criticised as the photograph was taken in summer, when ice in the area would be expected to melt, regardless of climate change. The image's story was widely discussed in climate sceptical fora as evidence of dishonesty and wrongdoing.

Similarly, a letter submitted to the journal *Science* 'Climate change and the integrity of science' (Gleick et al., 2010) was overshadowed by an editorial decision to display a polar bear image (Figure 3c) alongside the letter. The image used was a composite image created by Jan Will, showing a lone polar bear on a flat ice floe, floating in a serenely calm, blue ocean. An outcry occurred following the finding of the photoshopped nature of the image (O'Neill, 2017). Sceptical bloggers condemned the editors and letter writers for not recognising the image as a fake and made much of the irony of a letter about scientific integrity juxtaposed with a photoshopped image.

'Truthfulness' of a polar bear image's provenance extends beyond photographic stills. In 2011, the BBC released the documentary 'Frozen Planet' (BBC, 2019). The film attracted controversy for cutting wild polar bear footage into zoo-based footage, without mentioning their provenance. The filmmakers insisted that this information was not hidden, as it was provided on the programme's website (Huggan, 2015). Similarly, Mittermeier's 'emaciated bear' image (Figure 3d) was taken in the Canadian Arctic and shared to 'help people imagine what the future of climate change might look like' (Mittermeier, 2018, np). The image was posted on Instagram and picked up by *National Geographic*, becoming their most viewed video ever. It is estimated that around 2.5 billion people viewed the footage (Mittermeier, 2018). It was named one of *TIME* magazine's top 10 photographs of 2017 (Katz, 2017). *National Geographic* captioned it 'This is what climate change looks like'. This was met with an angry reception though, including from climate sceptics, who questioned the evidence for a direct link between this bear's poor condition and climate change. In 2018, *National Geographic* published an apology, stating they 'went too far in drawing a definitive connection between climate change and a particular starving polar bear' (Editor's Note, in Mittermeier, 2018). As these examples show, once polar bears became enmeshed and inseparable from climate change, the provenance of bear imagery becomes extremely important in how images are read.

3.5 | Cliché, comedy, and cartoons

By the 2010s, polar bear visuals were established as a visual metonym, conceptually able to stand alone – without explanatory text – to act as a signalling device representing an engagement, including a critique, of climate science or policy. This is evidenced by the growth of visuals which required audiences to understand (often complex) interlinkages between bears and climate change.

Polar bear visuals were parodied, viewed as cliché, and subject to comedic interpretations. The 'winking polar bear' is a powerful example of how visuals can become parodied to subvert the mainstream reading. This image accompanied a newspaper article titled 'Don't look now: James Delingpole is terrified by our susceptibility to doomsday scenarios' (*Telegraph*, 2007). The picture itself is captioned 'Sceptical: a polar bear weighing up the evidence for climate change'. It depicts an extreme close-up of a polar bear. The image focuses on the polar bear's face, and on his one closed eye. As this bear winks, it mocks the prospect of climate change impacting polar bear survival. Right-leaning newspapers used polar bear images to accompany stories ridiculing climate action, e.g., 'Don't panic (much)' (*Daily Mail*, 2008) and '10 mad ways to save the planet' (*Daily Mail*, 2009).

From the late 2000s onwards, the relationship between polar bears and climate change was so clearly established that bear visuals were now used to dispute the entirety of evidence for climate change. Polar bear visuals increased in the UK media, notably among right-leaning newspapers (Figure 2). Indeed, bear images became a key visual for the 'uncertain science' framing in climate change news (O'Neill et al., 2015). This was done both directly (polar bears are thriving, so doubt is cast on the whole issue of climate change): 'Polar bears "are thriving as the Arctic warms up"' (*Telegraph*, 2007) and 'Doomed? Don't you believe it' (*Daily Mail*, 2007) and also indirectly (polar bear visuals began to stand alone alongside ostensibly unrelated climate news, not even referred to in the news story text or the caption, as a shortcut to visually signal that this was a story about climate change, including climate scepticism): 'Global warming is the religion of our age' (*Daily Mail*, 2007), 'Emails "show climate change scientists massaged figures"' (*Telegraph*, 2009), 'If it warms up, who's going to pay?' (*Wall Street Journal*, 2009) and 'Leaders give up on signing a climate treaty' (*Daily Telegraph*, 2009).

These uses inverted and challenged earlier readings of the visuals, such that polar bear visuals were now routinely associated with climate change scepticism. Bear parodies were now used to cast doubt on the scientific evidence for climate change (Harvey et al., 2018). This was widely recognised, for example, a left-leaning UK newspaper avoided using polar bear imagery altogether during this period, as they represented a 'tired and hackneyed icon' (Leo Hickman, former *Guardian* editor, pers. comm., 13 July 2018).

Polar bear imagery started to feature in editorial cartoons from the late 2000s. Early examples of these cartoons appeared around 2008 (O'Neill, 2020), but the genre proliferated during the turbulent times for climate science and policy of the Climatic Research Unit (CRU) email hacking (popularly known as 'Climategate') during late 2009. Two exemplars

follow. The first, by cartoonist Matt, was published in the *Telegraph* on 6 December 2009 (it was clipped by a colleague and given in gallows humour to the author: as an ex-staff member of CRU and one who had recently published a paper on polar bear population dynamics). It plays on the themes of climate science uncertainty and deceit, depicting a sheepish polar bear on an ice flow, typing on a laptop despite slow flurries across the scene. It is captioned 'Secret email: Don't mention this, but its bloody freezing here'. The second, by Mac, was published in the UK *Daily Mail* (8 December 2009). It is typical of the developing genre of climate change cartooning, captioned 'OK, Smart Alec! So I flew. How did you get here?' (Figure 3e). The cartoon signifies the tension between flying (as a carbon-intensive form of travel) and attendance at a political event designed to address climate change. It features a huge, bad-tempered looking polar bear seated in an assembly of suited delegates for the 2009 Copenhagen COP15. Meltwater, signifying warming, lies in puddles down the aisle next to the bear and the penguins.

Polar bears were now well established as prominent signifiers in climate campaigning by 2009. Anti-aviation campaigning organisation Plane Stupid curated a campaign video which panned skywards across a cityscape, while polar bears fell from the sky and crashed to the ground (Figure 3f) to the sound of a plane overhead (Mother, 2009). The video dramatises the CO_2 emissions of a short-haul flight, linking it to the weight of a polar bear. The visuals play on horrifying iconography from the 9/11 attacks, as well as conventional images of animal suffering (Huggan, 2015). The video has garnered more than 1.3 million views online (YouTube, 2019). The polar bear's absence-presence continues to haunt climate protests, such as in an image from the September 2019 global Climate Strikes, New Delhi, where a child marches holding a placard featuring a cartoon of a healthy polar bear peering into the ocean – but reflected back is just the bear's skeleton (RTE, 2019).

3.6 | Memes and spoofs

The mutating and ephemeral online lives of polar bear images well demonstrates how these visuals are increasingly transposed and reproduced beyond their original forms in explicitly political ways. An example is a meme posted on Facebook, appearing in 2019 as the US Green New Deal stimulus programme gathered momentum (Figure 3g). It quickly provoked engagement (over 1,700 reactions, 6,300 shares, and 185 comments; Green New Deal, 2021). The meme features two images, the first showing a polar bear on its hind legs, leaning on the bonnet of a car and peering over at a person (captioned 'excuse me sir...') and the second of a polar bear chasing a person around the back of the car (captioned 'Can we please talk about Climate Change?'). The person runs away from the polar bear to avoid talking about climate change. The comedic element of the meme is, then, a parody of the predator/prey relationship, which invokes deeper concepts of risk and power.

The meme is far from static, though: part of the appeal of memes is their ever-changing nature as they respond to and riff off earlier forms and the developing political situation. An example in the comments thread shows a user commenting 'I made it better for you' as he develops the meme to label the polar bear 'AOC' (Democrat Alexandria Ocasio-Cortez) and the person 'GOP' (Grand Old Party, i.e., the Republican Party). The initials provide a further layer of meaning for the meme, as Ocasio-Cortez is the antithesis of the GOP: she is active online, is a political progressive, has strongly campaigned on climate change, and is the youngest women and first ever from the Bronx to serve in Congress. Thus, the meme plays on power imbalances as well as on very different political approaches to climate change.

Such parodic use of polar bear visuals continued, exemplified in an 'April Fool's Day' spoof article from the *Telegraph* newspaper depicting a polar bear, stranded via a melting sheet of ice, landing on a grassy ice-free Outer Hebridean Scotland island (Piaf, 2017). The spoof plays on themes of incredulity, disbelief, and scepticism over climate change and polar bears.

3.7 | Conflicting emotions

As polar bear images became connected with the panoply of climate change understandings, people's responses to these images have diversified. In a 2006 UK-based participatory workshop, participants were asked about their views on six climate 'icons', one of which was polar bears. Although a majority of people named polar bears the least relevant, nevertheless a substantial number of participants discussed a strong affective connection to the bears. This was explained via two contrasting reasonings: first, many participants expressed empathy for charismatic megafauna and second, the polar bear was representative of a pure and fragile ecosystem adversely impacted by climate change (O'Neill & Hulme, 2009).

Empathy for polar bears has also been demonstrated in a US-based study. Swim and Bloodhart's (2014) survey of American adults in 2012 explored how people reacted to messages of polar bears being harmed by climate change. They found messages motivated people to donate money to environmental activist groups. Results were partly explained by hope and empathy for the animals.

Polar bear imagery also has the potential to invoke feelings of interest and curiosity. Bear images were reasonably effective in promoting feelings of issue salience (importance) in O'Neill et al.'s (2013) Q-method study spanning the UK, USA, and Australia, and also in the similar study by Metag et al. (2016) with people in Germany, Austria, and Switzerland. Corner et al. (2015) found polar bear imagery was easily recognised and highly rated in a survey across US, German, and UK audiences. But more uncomfortable emotions of cynicism, irritability, and issue fatigue are also associated with polar bear imagery. In the 2006 UK workshop study, some participants felt strongly that polar bears were a highly clichéd, and completely disengaging, climate icon (O'Neill & Hulme, 2009). When Corner et al. (2015) carried out discussion groups after their survey, they found that polar bear imagery was likely to promote cynicism and issue fatigue. Polar bear imagery also appear to decrease feelings of self-efficacy in European and US audiences (Metag et al., 2016; O'Neill et al., 2013; O'Neill & Nicholson-Cole, 2009).

3.8 | The polar bear is (nothing but) climate change

By the end of the 2010s, polar bears had become associated with little else but climate change. 'It's the Skin You're Living In' was a film designed to explore and challenge climate visuals, through the medium of polar bear imagery (Figure 3h; Harradine, 2013). The film flits between the real and the virtual. Sometimes, it looks like a person dressed as a polar bear, and sometimes like it might be a real bear; the polar bear is sometimes human, and the human is sometimes the polar bear. Polar bears and humans haunt each other in a statement from scientist Patricia Romero Lankao at the launch of the IPCC's Fifth Assessment Report Working Group II, too: 'the polar bear is us' (Borenstein, 2014, np). Similarly, the *Daily Mirror* Climate Issue had a photograph covering the entire front page showing a polar bear standing on a small ice flow, captioned: 'The end of life on earth ... unless we change now' (Daily Mirror, 2019). In 2019, the BBC News website launched a climate change bot on its climate news messenger platform to enable audiences to learn about climate change through semi-automated conversations (BBC News, 2019). The launch webpage of the chat bot is illustrated by just one simple graphic and caption-less image – a polar bear on an ice floe.

Psychological research investigating people's spontaneous recollections of climate imagery – their 'top-of-mind' associations – also demonstrates how polar bears are now conclusively associated with climate change, at least in Anglophone nations examined to date: an image of a bear balanced precariously on a melting iceberg was the most commonly selected image associated with climate change in an Australian study (Leviston et al., 2014). In a UK study, children were asked for the first images that came to mind when they thought about climate change. It found polar bears accrued 5% of all elicitations, only slightly less than the 6% of elicitations of the closer-to-home impacts of sea-level rise and flooding (Lee, 2020).

Despite recognition of the now complicated entanglement between climate change and polar bears, bear iconography was still visually dominant in political campaigning – for example, by Greenpeace at COP21 (Corner et al., 2015) and as the visual of choice for 'clicktivist' organisation Avaaz when they launched an e-petition against Trump withdrawing from the Paris Accord (Wang et al., 2018).

Later on in the decade, online imagery research documented the growth of a new kind of polar bear visual, 'sick bear'. Lam and Tegelberg's (2020) Instagram study found bear visuals had become darker in colour and tone, with far less snow: acting as crime scene images – showing a victim but an absent perpetrator – a 'criminal Anthropocene'. Physical traces of climate crimes are read as visible marks on the bear victim's body in its malnourished body and sallow fur. This visual grammar is evident on other platforms, too: Google image searches for 'climate change' and 'polar bear' (21 August 2018, 23 August 2020; author data) revealed a growing number of similar visuals. Similarly, on TikTok, polar bear visuals appear to be the dominant imagery associated with #climatechange videos, also employing the 'sick bear' grammar (Jelley, 2021).

Using polar bears to dispute the entirety of climate change continued, becoming a rallying issue for climate sceptics. Harvey et al. (2018) demonstrated that blogs that denied or downplayed anthropogenic climate change were also those most likely to disregard the scientific evidence of Arctic sea-ice loss and polar bear vulnerability. By denying the impacts of climate change on polar bears, these blogs do wider work, casting doubt on climate change more broadly. In parallel, images of polar bears became not only the de facto image with which to dispute climate change, but also to represent the

wider uncertainty and scepticism concerns. This is exemplified by a 2018 article in UK newspaper *The Times*, detailing a new BBC editorial policy of not inviting climate deniers onto its programmes. The story visual was a polar bear, but the entire article and image caption make no mention of bears.

4 | THE WORK OF A VISUAL METONYM

In order to examine the political work of the polar bear visual metonym, it is illuminating to put it into wider context. Do visual metonyms exist beyond polar-dwelling charismatic megafauna? Candidates could include the 'Face of AIDS' and its link to HIV (Kitzinger, 1990). Or, the rich scholarship on the Madonna and Child, and the imploring waif, common to representations of poverty and malnutrition (e.g., Bennet et al., 2016; Briggs, 2003) and their UK-based counterparts (Crossley et al., 2019). Or, the victims of distant wars (Campbell, 2010). If so, which features define a visual metonym?

- *Repeated visual grammar*: Visual metonyms are recognisable through repeated visual grammar: the male, contorted, squinting, shaking Face of AIDS (Kitzinger, 1990); the waif as a single malnourished young child, with distended stomach (Banks, 2001); the Madonna and Child depicting a traumatised mother, pictured outside, holding a skeletal body, gazing with sunken eyes at the camera or her emaciated child (Briggs, 2003); the UK poverty images of lone children, abandoned shopping trolleys, graffiti, and derelict housing (Crossley et al., 2019); the passive and pitiable refugee women and children caught up in the Darfur conflict (Campbell, 2010). The polar bear is recognisable for being white and fluffy – even cute and cuddly, alone (or with a playful cub) on the sea ice, threatened by dark water.
- *Reproduced across everyday life*: Visual metonyms are not only widespread in media sources, but are reproduced, reinforced, and reiterated through everyday social interaction (Bennet et al., 2016; Campbell, 2010). Kitzinger (1990) details people acting out 'the face of AIDS' by contorting their faces, squinting, and shaking, and the bullying of a girl with facial eczema being called 'Aidsey' at school. Similarly, the polar bear metonym is reproduced through campaign costumes in street protests, in our imaginations exemplified by those top-of-mind image associations, through children telling their parents to 'turn off the lights or the polar bears will drown'.
- *Exclude other images*: Visual metonyms become so ingrained that it can be hard to imagine other ways of visually representing the issue, despite other equally valid possibilities. The waif, Madonna and Child, and Darfur images variously exclude supportive others (particularly men), or a home – or at least, stable – environment (Briggs, 2003; Campbell, 2010). Briggs notes how images of hunger and poverty miss the 'development projects that might redirect water supplies or military check-points that disrupt (or redirect) the distribution of basic foodstuffs' (Briggs, 2003, p. 179). This is also evident in the polar bear visual metonym: there are equally serviceable images with which to visually represent climate change: portraying air pollution in cities and links to human health, or images of meat consumption or flying in addressing climate mitigation (O'Neill et al., 2015).
- *Blind us to political alternatives*: The Madonna and waif visual metonyms set up the requirement for a white, rich, powerful, and male 'rescuer' (Briggs, 2003). The US 'migrant mother' image can be seen as an explicit call for the moral and political necessity of policy action, in this case, for the new deal (Briggs, 2003). These visual metonyms lean on notions of rescue, shelter, and care, while distracting attention from addressing root causes. As Bennet et al. explain, they become paradoxical: 'in the claimed act of raising awareness of the suffering malnutrition causes, the causes of famine – those things that ought to be addressed in order to prevent, alleviate or end famine – are overlooked or ignored' (Bennet et al., 2016). Likewise, the polar bear metonym: in situating climate change as eschatological, as distant in time and space, as concerned with charismatic megafauna and not human (in)action, the image is disconnected almost entirely from everyday political realities.

Why do some visual metonyms become pervasive? Is it helpful to search for an (elusive) image that communicates a complex issue in its entirety? As Perlmutter notes, 'the seeming naturalness of the imposed metonym masks the variability of its context … narratives seem compelling, familiar, and are assiduously replicated' (Perlmutter, 1998, p. 17). Bennet et al. (2016) call attention to an industry and economy that make it difficult to avoid the circulation and repetition of visual metonyms. The increasingly globalised media industry of major image banks and international news agencies certainly plays a key role in setting the boundaries of the visual discourse (Hayes & O'Neill, 2021; Machin & Polzer, 2015). Yet, the use of visual metonyms leads to a loss of specificity, where, as McQuire discusses in a critique of famine photography, visuals 'slide towards radical interchangeability' (McQuire, 1997, p. 59).

5 | CONCLUSION

In our image-saturated world, images still often fail to be taken seriously (Rose, 2012). While words are often deeply considered, images can be used with less care: sometimes, even carelessly. Images may be seen as representing an objective reality, rather than as normative statements (Urry, 1992), where gendered or racist themes that would not be tolerated in textual form are portrayed through subtle visual clues (Coleman, 2010; Rose, 2016). While it is relatively straightforward to create an image to illustrate a material object – few would argue with a polar bear image accompanying a news article about the impact of declining sea ice on polar bear populations – it is much more difficult to illustrate an abstraction (Banks, 2001) such as 'climate change'. We should be careful when it comes to communicating through images, especially if the images employed are metonyms. Whether it is climate change and polar bears, poverty alleviation and its nameless malnourished mother and child, or the contorted face of a man affected by AIDS, visual metonyms are not facile representations, but are instead a type of visual shorthand standing in for a complex and political engagement.

This paper has revealed the tangled social, cultural, political, and scientific histories of the polar bear and how, through these entanglements, polar bear imagery has become a visual metonym for climate change. It is seemingly straightforward to conclude that, with this complex history, polar bear visuals are polarising and politicised, and their use should be avoided by those wishing to engage people with climate change. However, this is to look at the issue from the wrong perspective. Following Roberts (2012), we need to grasp both sides of the paradox of polar bear images: using the concept of haunting helps to illuminate how they are both alive and powerful, and yet also inert and powerless. In particular, this paper has sought to understand the movement of polar bear images (Rose, 2016) – across people, places, platforms, and time. By becoming visual metonyms (in all their complexity and controversy), polar bear images instead show us the multitude of competing values, attitudes, and worldviews that we bring to bear on the issue of climate change, which can never be 'solved' or portrayed in a single visual image.

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DATA AVAILABILITY STATEMENT

Data available on request from the author.

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