

ARTICLE

“It’s the Only World We’ve Got.” Children’s Responses to Chris Jordan’s Images about SDG 14: Life Below Water

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Abstract

Broad and complex ideas about sustainability can be communicated through the Arts. Australian curriculum documents support the integration of Arts education with education for sustainability. Responding to artworks as a viewer is a key aspect of Arts education in Australian schools. Chris Jordan is a US artist whose online media galleries communicate ideas about environmental and social justice themes. This paper reports interview data from a larger project exploring children’s responses to Chris Jordan’s artworks. Conversations were held with 28 children aged between 4 and 12 as they navigated Jordan’s website to explore the images they encountered. Data relating to SDG14: *Life below water* were selected for the specific focus of this paper. Thematic analysis of the data revealed five themes: connections to prior experience and knowledge, links with local contexts and places, emotional engagement with the images, solutions and action-taking and ideas related to post-humanism and the human-nature binary. These findings endorse the power of Arts-based experiences for enhancing education for sustainability in primary schools and early childhood contexts.

Keywords: Arts-based; children; environmental education; environmental sustainability

Introduction

Broad and complex ideas about sustainability can be communicated and explored powerfully through the Arts (O’Gorman, 2020). As multiple climate and sustainability crises collide (IPCC, 2021), an increasing number of contemporary artists are using the languages of imagery, media, movement, music and drama to share their thoughts about the urgency of the problems faced by the planet and its inhabitants (Curtis, Reid & Ballard 2012; Song, 2012; Steiner, 2007). A growing number of Australian artists are responding to the climate crisis through their artwork (see, e.g. <https://climarte.org> and <https://and www.margaretwertheim.com/crochet-coral-reef>). Even very young children can learn about sustainability through the Arts, through making their own art and responding to the work of others (O’Gorman, 2015).

This paper reports on part of a larger research project (O’Gorman, 2017) that explored 28 children’s responses to the sustainability-themed media artworks presented online by US artist Chris Jordan (www.chrisjordan.com). Some of these confronting images depict many thousands of objects such as plastic cups, garbage and the negative impacts of human activity on the global ecosystem. The aim of this study was to explore how children might access the enormity of the sustainability issues explored in Jordan’s work. Would conversations about images depicting vast statistics and photographs of dead albatross chicks killed by plastic, for example, offer any useful

opportunities for learning about sustainability? Jordan’s images address many of the themes represented by the Sustainable Development Goals (SDGs). In this paper, I focus on how the participating children discussed images broadly relevant to SDG 14: *Life below water*.

Australian context

This study’s 28 participants were aged between 4 and 12. In Queensland, where the data was collected, children begin compulsory school between 4.5 and 5.5 years, so most of the children were attending primary school. The Australian Curriculum (AC) (2022) presents sustainability as one of three cross-curriculum priorities, outlining how sustainability can be integrated across the school curriculum, including the Arts. The AC reflects broad understandings of sustainability that encompass environmental, social, economic and cultural dimensions. In reference to integrating sustainability in the Arts curriculum, the AC states that students explore diverse world views about sustainable living, equity and social justice as communicated through historical and contemporary artworks. Students create artworks to make meaning about sustainability, respond to the works of others and consider using sustainable Arts practices.

The AC outlines four interrelated strands in the Arts: exploring and responding, developing practices and skills, creating and making and presenting and performing. Of most relevance here is the exploring and responding strand, particularly in relation to the ways in which the Arts “develop empathy and understanding of multiple perspectives, across personal, local, regional, national and global contexts.” Viewing the media artworks of Chris Jordan aligns with the exploring and responding strand and integrating sustainability as a cross-curriculum priority. Thus, the experiences of the study participants align with experiences they could have in school.

Several of the study participants were aged four to five years, so their educational experiences were in the prior-to-school sector. In Australia, the national learning framework for children aged birth to five is the Early Years Learning Framework (EYLF). The EYLF is a model of curriculum decision-making that describes a set of principles, practices and learning outcomes on which a curriculum can be built (Department of Education, 2022). Version 2 of the EYLF (2022) presents a broad definition of sustainability, encompassing the interconnected environmental, social and economic dimensions. While the EYLF does not present specific learning areas such as the Arts, the importance of supporting children’s creativity, imagination and play-based approaches is emphasised, with obvious relevance for Arts-based experiences.

The children who participated in this study resided in various parts of Brisbane and attended a range of educational institutions. Their parents were alerted to the study through convenience sampling.

Literature

Responding to images

Responding, viewing and participating as audience members are ways in which people receptively participate in the Arts (Australia Council for the Arts, 2010), and Arts engagement can be considered a human right for adults and children (Ewing, 2020; General Assembly, 1948; Mai & Gibson, 2011). Version 9 of the Australian Curriculum describes how children explore artworks and artists, considering the ways in which the Arts communicate meaning and emotion across diverse contexts, cultures, communities, times and places. Children respond to artworks by making art, discussing art and writing about art (ACARA, 2022). Previous research has shown that even very young children use complex and sustained strategies to connect with and communicate about artworks (Mai, 2013).

People respond to artworks in very personal ways. When children engage with the Arts, they are constructing who they are, building meaning about the world and exploring how they interact with meaning-making (Lemon & Garvis, 2023). Responding to artworks can be associated with a mix of feelings and emotions.

Emotional engagement

The Arts are uniquely positioned to connect with our emotions. Engaging with quality Arts experiences enhances children's social and emotional well-being (ACARA, 2022). The Arts provide people with languages to communicate ideas that are important, reaching beyond the spoken or written word (Eisner, 2002). The Arts break down traditional language and literacy barriers to enable communication across age groups (Knight *et al.*, 2016), across diverse cultures (UNESCO, 2010) and across time (Baker, 2012).

The Arts deal with what makes us essentially human, and all human cultures use the Arts to communicate meaning (Dinham, 2023). Responding to the Arts can prompt feelings of joy, excitement, connection, empathy, peace and community. The Arts reach us at our core, helping us to remember, to hope, to feel sorrow, to find balance, to understand ourselves and to appreciate (de Botton & Armstrong, 2013). Artworks can also be confronting, to prompt feelings of interest, surprise, sorrow, anger, disgust, confusion, shame and despair (Silvia, 2009). Jickling (2017) calls for sustainability education experiences that are held, felt and disruptive. The Arts offer a case for contributing to such experiences, as they allow us to see a troubled world from another's perspective.

Many contemporary artists are exploring topics related to sustainability such as climate change, ecosystem collapse, extinction crises, pollution, world poverty, social injustice, conflict and so on (Curtis *et al.*, 2012; Song, 2012; Steiner, 2007). Brook (2022) explored the emotional impact of environmental artworks on adults, revealing a wide range of emotional responses and mixed positive and negative responses to some artworks. While children may have the right to engage with artworks that address sustainability topics because they are relevant to their present and future lives, this is, potentially, a risky and emotional business. When events, behaviours and consequences have uncertain outcomes, these are deemed risky (Aven & Renn, 2009). However, there is an argument that children have the right to be emotionally impacted by images that tell a troubling story about our shared planet (O'Gorman, 2020) and that risk and resilience often go hand in hand (O'Gorman, 2019).

Risk and resilience

The AC (2022) emphasises that the Arts hold the potential to develop children's creativity, confidence, compassion and resilience, supporting them to contribute towards imagining, building and sustaining their communities and their futures. Engaging deeply with the Arts can involve risk-taking related to experimentation, problem-solving and trial and error (Harris & Carter, 2021). Making art can make us feel vulnerable if we perceive that our artwork is of poor quality. It is common for children to begin to lose confidence in their artmaking abilities around the age of eight (Lehrer, 2012). Aside from the risks involved in making art, the Arts can also involve risky subject matter that children may encounter as viewers, for example, of Chris Jordan's online galleries.

Over recent decades, commentators in some Western contexts have noted a decrease in appetite for risk in children's play (Wyver *et al.*, 2010), but this mostly refers to physical risk. Negotiating emotional risk is a further consideration. Häggglund and Johansson (2014) argued that educational spaces can be risky emotional spaces for young children when teachers enable children's rights to be exercised in a social context. In addition, children may be exposed to challenging news about global disruption and uncertain futures, so adults working with children

have a responsibility to help them to negotiate emotionally risky experiences. The Arts can support the navigation of these “emotional obstacle courses” (O’Gorman, 2019, p. 182).

While appetite for risk has reduced, certain tensions remain in the field of sustainability education for children. During the late 1990s, Sociologies of Childhood theories emerged, with children deemed more capable, competent and agentic than adults might have considered them to be (Dahlberg, Moss, & Pence, 2013; James & Prout, 1997). At the same time in the United States, environmental educator David Sobel (1996) urged adults to give children time to love nature before being asked to heal it. More recently Australian scholars Davis and Elliott (2014) have argued that children should not have to take responsibility for addressing the sustainability mess they will inherit, while at the same time emphasising children’s potential as agents of change for sustainability. These challenges offer both opportunities for risk and potential for building children’s resilience in the face of the current and future sustainability crises. While educators should take this responsibility seriously to ensure children are not harmed by their engagement with sustainability topics, children are exposed to challenging topics in a range of contexts, not just at school.

Prior experiences

Children enter learning contexts carrying with them prior experiences and socially constructed knowledge gained through conversations with friends and family, previous educational experiences and exposure to media. Constructivist learning theory suggests that learners are active recipients of information, building their understanding of the world by integrating new information into their pre-existing knowledge structures (Adams, 2006).

When children are exposed to new ideas about sustainability, they bring their prior knowledge and experiences of the topic to new learning contexts (Johannesson, Andersson, Arlemalm-Hagser, & Elliott, 2020). These new experiences will enrich children’s existing sustainability knowledge as connections are made and new perspectives are explored. The Arts provide novel perspectives and languages with which children might explore sustainability through making art and responding to it (Chapman & O’Gorman, 2022). Previous experiences of both the Arts and sustainability provide powerful “filters” (Lanier, 1968) that influence the ways in which children experience new learning opportunities. For example, when children experience Chris Jordan’s images, they will draw on their previous life experiences to make sense of the ideas depicted; they will connect with what they know and with the places where they live.

Connections with local context

Sustainability is a global challenge with local implications and the potential for local solutions. While individual actions are important, systemic changes are also urgently required (Ferreira, Ryan & Davis, 2021). Children may be too young to vote, but they can engage in advocacy and action-taking in local contexts and exercise their citizenship and democratic rights more broadly, as sustainability and democracy are both fundamental values in education (Engdahl, Pramling Samuelsson & Arlemalm-Hagser, 2023). An expanding body of international research in early childhood education for sustainability endorses the capacities of young children to identify issues and take action (see, e.g. Elliott, Arlemalm-Hagser & Davis, 2020). The School Strikes for Climate Justice illustrate the potential of young citizens to demand sustainability action on a global scale (Verlie & Flynn, 2022).

Place-based education, where children address issues related to their local context and to the places they love, also remains a powerful strategy for engaging children in real-world problems and solutions (Somerville & Green, 2015). Kalafati, Flogaiti and Daskolia’s (2024) Arts-based action research study found that young children’s creative thinking and action-taking can be enhanced by a focus on local environmental problems. Images and artworks depicting local

ecosystems and species in trouble can be part of a suite of resources used by educators to prompt conversations about relevant local sustainability topics (O’Gorman, 2020).

This paper reports on children’s responses to a set of Chris Jordan’s images that explore the sustainability topic of *Life below water* (SDG 14). Responding to images is a key aspect of Arts education for Australian children, and images hold the potential to prompt emotional responses. While there may be risks involved in exposing children to challenging content associated with sustainability topics, there is also potential to build children’s knowledge and resilience when supportive educators use images as educative tools. The next section outlines the research design of the study.

Research design

The number of child participants in the study was 28. The study was designed to minimise the possibility of children being harmed through their exposure to Jordan’s images. Data was collected via interviews between a researcher and the child, with the conversations as well as children’s browsing of the online images recorded. Interviews ranged between 11 and 47 minutes, with an average length of 26.86 minutes. During each interview, a parent or guardian was present, having received the link to the website beforehand so that they would be aware of the images their children may encounter. During the interviews, the researcher suggested galleries that were relevant to sustainability topics, but the children were in control of the images they viewed. If they didn’t want to spend time on suggested images, they were free to browse the website as they chose. This aligns with Danby and Farrell’s (2004) position, in that young children have the right to be both seen and heard as research participants, including in contexts that could be viewed as risky.

Ethics approval for the study was provided by the institution. Parents and children provided written consent for their participation. All provided consent for audio and screen recording of the conversations and web browsing, while a small number did not provide consent for filming of the participants.

The conversations were transcribed verbatim. Data were then analysed using Braun and Clarke’s (2006) six steps of thematic analysis:

1. Familiarisation with data
2. Generating initial codes
3. Searching for themes
4. Reviewing themes
5. Defining and naming themes
6. Producing the report

Five key themes emerged from the data:

1. Connections to prior experiences and knowledge
2. Linking with local contexts and places
3. Emotional engagement with the images
4. Solutions/action-taking, both individual and systemic
5. Post-humanism/human-nature binary

The data is organised around these themes in the upcoming section. Participants are referred to with a letter and their age in years.

For this paper, I was interested in children’s responses to images that relate to SDG14, *Life below water*. Given the volume of data generated in the larger study, it was prudent to take a selective and focussed approach rather than attempting to report on the data set in its entirety.

Chris Jordan’s online galleries include many images that communicate ideas relating broadly to SDG14. For example:

- *Gyre* (Jordan, 2009b) (based on *the Great Wave off Kanagawa* by Katsusuhika Hokusai) depicts 2.4 million pieces of plastic, equal to the estimated number of pounds of plastic pollution that enters the world’s oceans every hour;
- *Shark Teeth* (Jordan, 2009c) depicts 270 000 fossilised shark teeth, equal to the estimated number of sharks of all species killed around the world every day for their fins;
- *Tuna* (Jordan, 2009d) depicts 20 500 tuna, the average number fished from the world’s oceans every fifteen minutes;
- *Midway* (Jordan, 2009a to current) presents photographs of albatross chicks that have consumed floating plastic and died on Midway Atoll in the Pacific Ocean;
- *Gyre II* (Jordan, 2011a) (based on Van Gogh’s *The Starry Night*) depicts 50 000 cigarette lighters, equal to the estimated number of pieces of floating plastic in every square mile in the world’s oceans; and
- *Whale* (Jordan, 2011b) depicts 50 000 plastic bags, equal to the estimated number of pieces of floating plastic in every square mile in the world’s oceans.

Findings and discussion

Connections to prior experiences and knowledge

Constructivist learning theory proposes that learners take on new information to build on their previous knowledge (Adams, 2006). One of the themes that emerged from the encounters with Jordan’s images was that the children in this study made connections with school learning experiences, documentaries, famous paintings on which the images were based or family and life experiences generally.

Responding to the *Gyre* (Jordan, 2009b) image of a wave of plastic debris, G8 recalled seeing “a video at school and it looks horrible. The water’s all brown and mushy with bits of straws and stuff in it.” A12 recalled reading about the “Pacific thing” (presumably the Pacific Garbage Patch), “. . . the big chunk of plastic.” G8 also described seeing images of polluted oceans at school. P8 responded to one of Jordan’s plastic bag images by discussing microplastics, “One plastic bag can go into like, a hundred microplastics.” When asked how she knew about microplastics, she said, “We watched a video at school and it showed that, like, there’s this thing called an ocean cleaner and this person and he’s cleaned, I think it’s by 2040 he’ll halve the size of the Great Pacific Garbage Patch.” Some of the children recalled viewing the *Midway* (Jordan, 2009a to current) albatross images “at school,” while M11a described being asked to find similar images for a “Ban the Plastic Bag project” for which she had found an image of a whale that had consumed plastic. L10 also recalled seeing the images at school but “didn’t want to.” Also responding to *Midway*, E8 detailed her previous exposure to ideas about plastic pollution: “We’ve been watching David Attenborough, we’ve been looking at photos, we’ve been looking at PowerPoints and stuff at school and we’ve seen all of this.” For these children, prior school experiences provided a connection to their analysis of Jordan’s online galleries.

The conversations included connections with documentaries viewed previously by the children, presumably at home and at school. The *Shark Teeth* (Jordan, 2009c) caption reminded H11 of graphic footage of a finned shark, “I’ve seen an image of a shark just lying in a boat and they’ve cut the fin, and they chucked the shark overboard and they just lay there and no water going into their gills, they just die.” The same participant responded to the *Tuna* (Jordan, 2009d) image by invoking a David Attenborough documentary about overfishing, “. . . they were talking about if you overfish then you start affecting fish stocks and then the whole ecosystem will

collapse.” He then described efforts in Palau “where they’ve stopped fishing completely, then the fish stocks have overflowed into places where fishing is allowed and then it actually works for the better . . .” It seems that recalling documentaries invoked both positive and negative stories about life under water.

Jordan based *Gyre* (2009b) and *Gyre II* (2011a) on famous artworks, and this provided a point of connection for some of the children during the conversations. In response to *Gyre*, H9 said, “This picture I know.” *Gyre II* is based on Van Gogh’s *Starry Night* and several recognised the work: “I’ve seen this one before,” said P8. M12 chose to look at the image because it was familiar to her: “That’s why I picked it . . . When you recognise something, you’re more interested in what it is.” This suggests that Jordan’s strategy of connection to famous artworks provided an access point for some of the children, prompting their curiosity to choose these particular images for further investigation.

Children told stories of family and life experiences generally as they viewed and discussed the images. A7 drew on existing knowledge of turtles mistaking plastic bags for jellyfish as they responded to *Whale*’s (Jordan, 2011b) plastic bags. A5 responded to the albatross images by citing a dead bat he’d seen previously, while S8 recounted finding a dead bird and burying it. When viewing *Whale*, the youngest participant, F4, made a lengthy connection with a cartoon story of a sick dolphin. G8 talked about reading a book called *Saving the Sea* “about plastic and stuff.” M11a described making a poster and marching with her mum and how her mum had shown her a video of a turtle impaled by a straw. When describing making the protest posters, she said, “It was fun making them but it’s really sad that we have to do that.” Prior school and family experiences provided the young participants with rich opportunities for connection to the research experience of viewing Jordan’s images about life under water.

Linking with local contexts and places

Connections with previous experiences were also reflected in the ways in which children told stories about their local contexts as they compared or contrasted these with Jordan’s images. When responding to *Gyre* (Jordan, 2009b), G8 stated, “I have not seen that much plastic in the ocean, because when I go to the beach, I just see clean water.” Later in the interview when the *Whale* (Jordan, 2011b) caption was read to her, G8 said, “That’s why I don’t see turtles every single time I go to the beach.” S12 responded to *Gyre II* (Jordan, 2011a) and the issue of marine plastic: “I see it when I go down to the water, and it all washes up on Moreton [Island] and stuff.”

The images seemed to prompt some participants to link with local wildlife. Some of the younger children mistook the albatross images for local birds. F4, G5 and G8 all thought that the albatross was an ibis, a common long-beaked bird in Southeast Queensland. The *Midway* (Jordan, 2009a to current) albatross images also prompted P10 to tell a story of a turtle rescue, “When my family was at the beach, we saw a turtle that was being taken to the vet or something because it had swallowed a plastic bag and had washed up on the beach.” We can see here that the images provided children with opportunities to consider and discuss local ecosystems and how pollution might be impacting on other species living locally.

Emotional engagement with the images

Emotional responses to the images were common in the conversations. Across the age range, children often used the word “sad” to describe how they were feeling as they browsed and chatted. G8 felt “weird and sad and interested” about the amount of plastic depicted in *Gyre* (Jordan, 2009b). When D6 zoomed in to see the detail of *Gyre*, he exclaimed, “Oh that just sucks!” In response to the same image, H9’s response included “It’s really bad. It’s just horrible . . . Oh my god” and then speculated that if a whale or a seal was under the debris it might suffocate. M11 appreciated Jordan’s creative approach in this image but described the statistics as “terrifying.” S8

expressed that she was “scared” to zoom in on the *Whale* (Jordan, 2011b) image to reveal its composition. When she discovered it was made of plastic bags, she said that all of the images she’d seen to that point “look really sad to me.” A sense of sadness was also often mixed with appreciation for the artist’s techniques. In response to *Gyre II* (Jordan, 2011a), P8 found the artwork to be “cool” but didn’t like the statistics about plastic in the oceans.

Expressions of empathy were found in several responses. E8 expressed empathy with the sharks that have lost their fins (*Shark Teeth*, Jordan, 2009c): “. . . imagine if your fins got cut off for food and you wouldn’t be able to swim, which means you wouldn’t be able to live,” and E9 took the tuna’s perspective to empathise with the fish losing their family to fishing practices. The youngest participant, F4, suggested that the *Midway* (Jordan, 2009a to current) albatross chick’s parents would be “disappointed” that it had died.

The *Midway* (Jordan, 2009a to current) album was, as expected, a strong focus for powerful emotions. “Sad” was an expression used by numerous children as they browsed the images of dead albatross chicks, with M11b describing the images as “sad to another level.” Other children used words such as “depressing,” “confronting” and “disgusting” and that they felt “sorry for the bird.” M11b acknowledged that it was good to be reminded that human actions have consequences but that Jordan’s images, with their “sad vibe” were having an impact on him. P9 was one of the participants who described the albatross images as “sad,” but she went further to reflect on the consequences and the artist’s intent. This quote also provides a useful snapshot of the nature of the research conversations:

P9: *They’re actually really sad because, these animals . . . it’s kind of our fault they’re getting damaged. And we should be the people who are fixing it.*

Interviewer: . . . *Do you want to talk a little bit about what you think that he’s trying to say?*

P9: *I think he’s trying to say, I think the word is grief. You should feel like, grief when you see animals die because of you because they have plastic and it’s probably your fault because you didn’t pick up that rubbish or something like that.*

Interviewer: *Do you want to stop looking at them?*

P9: *Yeah, it’s kind of making me feel sad.*

Interviewer: *That’s fair enough. Do you think kids should look at these pictures?*

P9: *I think actually they should because I want them to know, actually, and I think Chris wants them to know, actually . . . to show people what we’re doing. Like, if you pick up rubbish whenever you see it, that’s just going to make a big difference, even though it’s like one piece of rubbish, you’re saving an animal’s life by getting it.*

This longer quote is noteworthy because of the connection between the emotional response and action that can be taken.

Solutions/action-taking, both individual and systemic

The collection of artworks prompted interesting discussion about solutions to the depicted environmental problems, across the age range of the participants. Popular solutions included recycling plastic, picking it up, reducing plastic consumption and using it for other purposes such as for creating art. For example, the youngest participant (F4) responded to the *Midway* (Jordan, 2009a to current) image of dead albatross chicks by suggesting the problem could be fixed: “That’s

why we put our rubbish into a recycling bin without putting it in the ocean.” One of the older participants, L12 said that the albatross photos were a “smart” idea because “if lots of people see it they might reduce the amount of plastic they use or put it in the right bins.” Correct disposal or reuse of plastic was a suggestion by several children. G8 described her family’s “giant drawer full of plastic that we use for the rubbish.” H9 responded to the collection in general by saying, “They should keep it [plastic] away from beaches or maybe just put the rubbish in the bin . . . so that birds or other animals don’t die, especially sea creatures.” The artwork *Whale* (Jordan, 2011b) prompted comments about disposal and reuse of plastic bags, along with reducing plastic use in the first place by choosing glass and metal storage products: “I have a giant metal lunchbox” (G8). When asked if the *Midway* images made him want to recycle more or less, A5 said “more, more, more! Times one thousand million.” The *Midway* and *Whale* images also prompted suggestions about washing and reusing plastic. E8 said, “We’re trying to reduce our plastic and we’re trying to reuse our plastic, like, if we take out a Ziploc bag we try and wash it, I dunno, three times before we throw it out.” In response to *Whale*, P9 suggested that plastic bags “are kind of just a want not a need . . . you don’t really need them. You can just get material ones . . . use them in different ways because plastic bags . . . you can’t get rid of plastic, it’s too good material to give up but you can stop using it except for special times. In a similar vein, and most likely inspired by the art viewing experience, S8 suggested it is better to use the plastic bags for art: “At least it’s not going to waste in the ocean and it’s making sculptures.” Actiontaking responses also addressed how the *Midway* images could promote changes in attitudes by helping people to “respect natural things better” (D6). G8 seemed to incorporate an emotional response to the albatross images: “It’s so sad. If I went to one of those beaches, I’d make a grave for the animals. I’d take all the rubbish out. And that’s in one beach.”

Food choices were also raised as a solution to the environmental problems depicted in the artworks. In response to *Tuna* (Jordan, 2009d), E8 stated, “We need fish to survive. We need meat. But then I feel we should cut down on our meat and stuff so then only the ones that are approved can [fish].” She also suggested “putting a few rules around” around shark finning practices: systemic solutions rather than individual actions. One of the 11-year-old participants responded to *Shark Teeth* (Jordan, 2009c) by suggesting that all of the sharks be used, “That’s mean! If they really needed to use the shark fin they could use all of the shark instead of just one fin” (M11a). It’s possible that Jordan’s use of vast statistics (270 000 sharks killed per day, 20 500 tuna every 15 minutes) may emphasise the issue of overfishing for these young viewers.

Post-humanism/human-nature binary

The final theme evident in the data was that, in responding to Jordan’s images, some participants expressed views that reflect post-humanism: ideas beyond the human-nature binary to position humans as part of the ecosystem. It was the albatross images that seemed to prompt these ideas most readily. In reflecting on Jordan’s images, G8 said that she will remember the “dead birds . . . because it’s an animal and we’re animals so I guess I kind of remember that.” For E8, the *Midway* (Jordan, 2009a to current) conversation turned to plastic use and how it threatens the entire ecosystem: “If we keep polluting these oceans and keep polluting the land, we will also die because we won’t know, like most of our food is meat and most of our meat we need to survive.” P8 described feeling “sad that people are thinking, oh just chuck it on the ground and nothing will happen. But actually a fish could come and swallow that, die and then we come to eat the fish and then we get very sick so if the fish eats microplastics and then we eat the fish, well some people eat the fish and then they get sick.” S7 described the albatross images as “bad” because “if the birds are gone, the animals that eat the birds are gone and if they’re gone, every animal in the world is gone and if every animal in the world is gone, including chickens, people are gone.” One of the older participants, M11b discussed the impact of the *Midway* albatross and another similar gallery in this way: “If you look at some of his artwork, it’s showing how we’re impacting our world and the

things around us. It’s the only world we’ve got. We don’t have another one, so take care of it and not try and destroy it, like we’re doing right now.”

Conclusion

I sought in this study to explore how children between the ages of 4 and 12 might respond to Chris Jordan’s images about the impact that humans are having on life on our planet. The study was designed carefully to ensure that children had an opportunity to share their views about environmental issues in a supportive environment that minimised emotional risk. Given that some of Jordan’s images are confronting and the statistics overwhelming, I commenced the research with a degree of caution, acknowledging that environmental education scholars in the past, such as Sobel (1996), have shared diverse views about whether this type of exposure is beneficial for young children.

This paper has presented data that I suggest demonstrates the rich benefits of including Chris Jordan’s images in educative experiences with children throughout the primary school years, even from as young as four. The data reported here demonstrate how conversations based on using Jordan’s galleries as prompts provided children with extensive opportunities to make connections with what they already knew and their experiences of their own special places. Such conversations, guided by supportive adults, provided children with a platform to express their deep emotions about what is happening in the world and the impact humans are having on non-human species with which they share this planet. Importantly, the images and conversations provided children with a space to explore the actions that they, and all of us, might take to address some of the many wicked sustainability problems we face.

While there are risks involved in exploring confronting sustainability themes with children, this study’s findings have endorsed the notion that children are often more knowledgeable and capable than adults consider them to be. Even quite young participants in this study shared sophisticated views about humans’ position in the ecosystem and the solutions that are available to address the unsustainability of human’s actions.

Images and artworks are powerful tools that can be employed in education for sustainability. Vincent Lanier’s (1968) theory outlined how our responses to art are shaped by what the work reminds us of, where it is located, how we have learned to analyse art and the relationship the work has to our lives. Many of the responses outlined in this paper reflect aspects of Lanier’s theory of art education. However, when artworks are chosen for a particular focus on environmental themes, the potential for deep learning about sustainability is magnified. Chris Jordan presents his images as artworks in a set of online galleries. In a scientific setting, a photograph of a dead bird might elicit conversations of a particular scientific bent, but when viewed in an online gallery of media artworks, the image may be perceived differently. Meaning-making is a core aim of the Arts (Wright, 2012). Therefore, when an audience — even a young one — is exposed to Chris Jordan’s images as artworks conveying a particular meaning, they might reflect more deeply on the artist’s intent and on the messages the images are communicating about sustainability and environmental harm.

The participants in this study were children between the ages of 4 and 12, but the use of environmental artworks is not limited to this age group, and of course, educators are not limited to the use of Chris Jordan’s images. While this paper reports on a study that was necessarily limited in focus, there are endless possibilities for exploring similar strategies with learners from all age groups, exploring sustainability topics from multiple angles and employing the artwork of a range of international and local artists. Previous research on this topic (O’Gorman, 2020) explored the benefits of using local images of sea turtles in Southeast Queensland impacted by marine debris, as an alternative to Jordan’s images of albatross chicks from Midway Atoll. Local images are likely to endorse the principles of place-based education and encourage meaningful action-taking in the

local context. Kalafiti *et al.*'s study is an excellent example of how making and responding to artworks about environmental problems can enhance localised environmental education and action-taking. Annual events such as Clean Up Australia Day can provide a context for a unit of work, adapted for any age group of learners. Such a programme could be launched from either an Arts or a Humanities and Social Sciences perspective, integrating sustainability as a cross-curriculum priority. Regardless of the curriculum angle chosen and the age group of the learners, my hope is that the findings presented here may encourage educators to consider more deeply the value of Arts-based experiences, even when such experiences might be somewhat confronting, for enhancing education for sustainability.

According to Baker (2011), "the arts are the primary identifying means to distinguish human life from other life forms on the planet" (p. 23). This claim is interesting, possibly true, but not necessarily helpful. Rather than focussing on what distinguishes humans from other life forms, the Arts can also be a vehicle for reminding us that we are part of the global ecosystem and also a species causing immense damage to the biosphere. If the young participants in this study can recognise this and discuss complex ideas about sustainability, then it is timely for adults to explore more fully the role of the Arts as a tool for sustainability education.

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