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Choosing to live environmentally childfree: private-sphere environmentalism, environmental activism, or both?

Erik Nakkerud[1,2]

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Abstract
Choosing not to have children can be considered a pro-environmental behaviour with a very high environmental impact. However, such impact calculations have been criticised for focusing only on private, individual actions. In the current article, the aim was to build on studies that have identified activist aspects of living environmentally childfree, and analyse whether this choice, in a Norwegian context, should be categorised as private-sphere environmentalism or environmental activism. This is explored through an analysis of interviews with 16 participants who have restricted reproduction due to environmental concerns, identifying three subthemes related to private-sphere environmentalism and three subthemes related to environmental activism. The results indicate that living environmentally childfree has central aspects of both private-sphere environmentalism and environmental activism, suggesting an interaction of different types of environmentally significant impacts. The implications of these results are that research on pro-environmental behaviour should look for an interaction of impacts and assess their significance beyond the immediate, individual level.

Keywords Pro-environmental behaviours · Childfree · Environmental activism · Environmental impact

Introduction

Living environmentally childfree

Intergovernmental reports on both climate change (Intergovernmental Panel on Climate Change, 2022) and biological diversity (Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services, 2019) present dramatic environmental changes that will take place if sufficient action is not taken, in addition to changes that are already occurring, especially regarding the loss of biodiversity.

Concerning individual action that could mitigate the environmental crises, calculations show that having one child less is the pro-environmental behaviour with the highest ecological impact (Murtaugh & Schlax, 2009; Wynes & Nicholas, 2017). Building on such calculations, theoretical studies on the ethics of procreation have concluded that we are ethically obliged to having small families, restricting reproduction to not having children or only having one child (Conly, 2016; Rieder, 2016). In the present article, the focus is on those who out of environmental concern choose not to reproduce at all, a phenomenon that could be termed living environmentally childfree.

Survey studies have indeed found negative correlations between environmental concern and reproductive attitudes (Davis et al., 2019) and intentions (Andrijevic & Striessnig, 2017; Arnocky et al., 2012; Bielawska-Batorowicz et al., 2022). However, a study in the countries Hungary, Czech Republic, Poland, and Slovakia found heterogenous results across the countries, where both positive and negative associations between climate change concern and the ideal number of children were observed (Szczuka, 2022). Modelling the possible role of gender, a US study found that having more children is associated with less concern for climate change for women, but not for men (Price & Bohon, 2019).

Regarding the content of the environmental concern concept, a study found that when splitting environmental concern into the ecological impact of procreation and the climate impacts that children will experience, US-American respondents who connected climate change to their own reproductive plans were highly concerned with both issues,

✉ Erik Nakkerud
erik.nakkerud@oslonh.no

[1] Department of Psychology, Oslo New University College, Oslo, Norway

[2] Department of Psychology, University of Oslo, Oslo, Norway

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but significantly more concerned with the impacts children will experience (Schneider-Mayerson & Leong, 2020). A similar study with Chinese respondents also found that when asked about reproductive climate concerns, the concern for children's future was considered more important than concern for the ecological footprint linked to reproduction (Fu et al., 2022). However, the levels of reproductive climate concerns among climate-alarmed Chinese were generally lower than among the similar group of US-Americans.

While there seems to be a possible relationship between environmental concern and reproductive intentions, the prevalence of this phenomenon is another question. A global survey with 10 000 young people from Australia, Brazil, France, Finland, India, Nigeria, Philippines, Portugal, UK, and USA, found that 39,1% of the respondents reported being hesitant to have children due to climate change (Hickman et al., 2021). Similarly, a Norwegian survey on fertility found that among respondents without children, about 40% endorsed environmental concern as a reason for not wanting to have children (Cools & Strøm, 2020). However, it is important to note that the respondents did not have to prioritize, meaning they could endorse a multitude of reasons. Going beyond cross-sectional data, a longitudinal study with 10 000 men and women in the UK, found that at over a period of six years (following those who did not have children at wave 4 all the way to wave 10), a person unconcerned about environmental behaviour was about 60% more likely to go on to have a child when compared to a committed environmentalist (Lockwood et al., 2022).

Many of the studies above refer to the calculations presented by Wynes and Nicholas (2017). In a comment to these calculations, Pedersen and Lam (2018) suggested that their way of measuring ecological impact represents a limited view on pro-environmental behaviours, since their explicit exclusion of emission reductions from civic actions means that only individual actions in the private sphere are taken into account. Pedersen and Lam (2018) presented an approach that also includes individual and collective actions in both private and professional life, arguing that these actions also play an important role in the transition to a sustainable future. This approach raises the question of what kind of pro-environmental behaviour reproductive choices should be understood as.

Environmentally significant behaviour and interaction of impacts

The arguments put forward by Pedersen and Lam (2018), are in line with Stern's (2000) multi-levelled framework for environmentally significant behaviour. In this framework, pro-environmental behaviours are grouped into four categories based on the types of behavioural impact: environmental activism (e.g., active involvement in environmental organisations and demonstrations); non-activist behaviours in the public sphere (e.g., voting behaviour or policy support); private-sphere environmentalism (e.g., the purchase, use, and disposal of personal and household products that have environmental impact); and other environmentally significant behaviours (for instance, influencing actions in the workplace). Applying this framework, Pedersen and Lam (2018) can be understood as arguing that Wynes & Nicholas (2017) only focused on private-sphere environmentalism, overlooking both activism and collective action. However, the fact that having one child less reduces one's ecological impact way beyond other individual actions does not necessarily mean that restricting reproduction is only a private and individualised pro-environmental behaviour.

A movement like BirthStrike, whose members communicated the urgency of the ongoing environmental crises by refusing to have children (Hunt, 2019), illustrated how living environmentally childfree might also be conceptualised as a type of environmental activism. Interestingly, the BirthStrikers changed their name in 2020, and became a support group entitled "Grieving parenthood in the climate crisis: Channelling loss into climate justice" (McMullen & Dow, 2022). One of the reasons for this change was that they felt they lost control of the group's narrative, as the media and public attention was directed more towards demographic solutions and less towards the political changes the groups went on strike for.

The story of BirthStrike potentially highlights a range of issues related to environmental behaviours, activism, and climate communication. On a theoretical note, it shows how Pedersen and Lam's (2018) critique of Wynes and Nicholas (2017) was itself based on the assumption that living environmentally childfree primarily is a private pro-environmental behaviour. This assumption is arguably implicit in Stern's (2000) framework as well. Because while Stern (2000) acknowledged that causes may interact when leading to environmentally significant behaviour, his framework did not give similar attention to the notion that also the types of significance may interact. Put differently, the framework does not emphasise how an action may be environmentally significant in more than just one way. For instance, private-sphere environmentalism could also be considered as environmental activism in cases in which private-sphere behaviour influences other people's environmental behaviour. This example illustrates the idea: When a person rides her bike to work, she has chosen a mode of transportation that is environmentally friendly, while at the same time communicating what kind of society she wants, potentially influencing other people.

Interaction of impacts should not be confused with spill over effects between different types of behaviour,

where studies, for instance, find that private-sphere behaviours influence policy support (e.g., Hagmann et al., 2019; Truelove et al., 2016; Werfel, 2017). It should also be distinguished from more general attempts at establishing relationships between environmental activism or environmental identity and other pro-environmental behaviours (e.g., Dono et al., 2010; Kashima et al., 2014). The argument is rather that a single behaviour might be environmentally significant in more than just one of the four types defined by Stern (2000).

This theoretical argument is supported by empirical work, as studies have shown that when climate change communicators have low carbon footprints, this can affect their audiences' intentions to conserve energy (Attari et al., 2016) and support green public policy (Attari et al., 2019). Thus, a low carbon footprint is in itself an expression of private-sphere environmentalism and has implications for the effects of environmental activism, illustrating an interaction between different types of environmentally significant behaviour. Similarly, other research has found that people who stop flying as an individual action to mitigate climate change also affect other people's attitudes towards flying and climate change (Westlake, 2018). These persons' commitment and expertise were identified as their most influential qualities.

Categorising living environmentally childfree

Psychological research that views reproductive choices as environmentally significant behaviours is still in its early phases, but the issue of how to categorise such behaviours is already emerging. A study with 607 American "climate leftists" found that a "surprisingly prominent category was the political dimensions of respondents' reproductive choices" (Schneider-Mayerson, 2021, p. 7). More specifically, one of these dimensions related to how young people of childbearing age use their reproductive potential to influence environmental attitudes and politics, suggesting that the choice to live environmentally childfree might be categorised as environmental activism. It is worth noting that for some participants the political dimension was instead related to having more children than they otherwise would, attempting to counterbalance a perceived fertility gap between liberals and conservatives, building on the notion of green parenting. While this is opposite to the idea of living environmentally childfree, it nonetheless underlines the activist aspects of reproductive decisions.

However, another study with both Americans and New Zealanders (Helm et al., 2021, study 2) discussed activist aspects indeed, but also found that participants who considered their knowledge of climate change as playing an important role in their reproductive decision-making, reported a feeling of individual responsibility combined with a lack of hope regarding politicians' and corporations' efforts. This, in turn, suggests that living environmentally childfree could also be categorised as isolated private-sphere environmentalism.

In sum, it seems like the choice of living environmentally childfree cannot be categorised as just one type of environmentally significant behaviour. Based on Stern's (2000) framework, it has aspects of both environmental activism and private-sphere environmentalism.

Aims of the study

The primary aim of the current study is to explore the assumption that living environmentally childfree primarily is a private pro-environmental behaviour, an assumption implicit in Pedersen and Lam's (2018) critique of Wynes and Nicholas' (2017) overview of the impact of pro-environmental behaviours. In doing so, the study builds on similar studies that have identified both activist (Helm et al., 2021; Schneider-Mayerson, 2021) and private-sphere (Helm et al., 2021) aspects of living environmentally childfree, aiming to investigate how these findings relate to findings in a Norwegian context. Thus, based on interviews with people who have chosen to live environmentally childfree, the study is guided by the following research question: What type of pro-environmental behaviour does the choice to live environmentally childfree constitute in Norway?

Methodology

Ethical and reflexive considerations

The research project was approved by the Norwegian Centre for Research Data (reference number: 587163).

Doing research on a phenomenon like living environmentally childfree has several ethical implications that should be considered, two of which will be addressed here. First, the logical basis of such research is simple: Less people equal less pressure on the ecosystems which humans and other species need to survive and thrive. However, a possible next step in this logic cannot be denied either: Committing suicide or even killing other people would also mean less pressure on ecosystems. Therefore, it is essential to emphasize the ethical distinction between actively ending one's own or someone else's life, and passively not creating new life. It is arguably the same distinction between active and passive that makes active euthanasia seem less acceptable than passive euthanasia (McLachlan, 2008), even though this is a different topic. Second, researchers must be aware of how a study that combines reproduction, environment, and

population, swiftly might be tangled up in racist or fascist discourses on birth rates and population control (Bhatia et al., 2020). Some of the other implications include variations of the two addressed above, such as the topic's potential negative psychological impact on children and parents.

Regarding researcher reflexivity, the author behind the present article has no children and remains undecided as to whether having children at some later point. It is likely that the author would have asked different research and interview questions as a mother or a father. The processes of interviewing, analysing, and reporting the research, are also likely to both have influenced and been influenced by how the author relates to and understands the phenomenon being studied.

Furthermore, and of importance for the issue of private-sphere versus activist understandings of the phenomenon, the author was a member of The Green Party in Oslo, Norway, from 2013 to 2016. While the author's later transition to doing research within environmental psychology initially represented a turn away from political or activist understandings to looking at individual, private behaviours, this background might still have influenced how the author framed the research approach and analysed the results.

Data collection

This article is the second article based on the same interview material. The first article explored psychological and social processes around the choice of living environmentally childfree (Nakkerud, 2021a). Thus, the two articles serve different goals, namely psychological description, and theoretical conceptualisation, respectively. The use of the same interview material for two separate articles thereby adheres to reporting standards for qualitative research (Levitt et al., 2018).

The project's first article (Nakkerud, 2021a) was based on semi-structured interviews with 20 participants who did not want to have any children or only have one, partly or fully out of environmental concerns. While parents and non-parents had many similarities regarding their eco-reproductive concerns, there were also important differences between these two groups. Most importantly, parents seemed to be more optimistic about the future and their opportunities to contribute to positive changes (Nakkerud, 2021a). However, as only four of the 20 participants were parents, it was not possible to make reliable comparisons between parents and non-parents. For the same reason, the present article has excluded parents from the analysis, resulting in a sample of 16 participants who had decided to live environmentally childfree. Moreover, it seems more sensible to reserve the term childfree to those who indeed have not reproduced themselves.

Two main goals guided the sampling procedure: To have a majority of females, because of their major role in reproduction, and that most participants should be in their twenties and thirties, because the average age for having one's first child in Norway is 30,1 years (Andersen, 2022).

13 of the participants were recruited through posting project information on Facebook on April 1st 2019, which then was shared organically in the author's contacts' networks, as a sort of snowball sampling (Browne, 2005). The author had no prior connections to these participants, and they themselves had to take contact to be invited to participate. The remaining three participants were invited to participate based on their publicly expressed views on the topic. All participants were given information about the research project's purpose and their rights as participants, including the right to withdraw at any time. All participants consented to participate. Due to the sensitive nature of the topic, participants were assured that the full interview transcripts would remain confidential and not be shared. Furthermore, demographic characteristics are collapsed across participants to secure their anonymity (see Table 1).

Twelve of the participants were interviewed individually and four as couples, giving a total of 14 interviews. Two of the individual interviews were telephone interviews, while the remaining were conducted face to face. The respondents answered questions regarding their decision to live environmentally childfree, including for instance what sort of reactions they got from other people, and how they lived their childfree lives as couples or single.

Table 1 Demographic characteristics of the 16 participants

Sex		Age		In a relationship	
Male	5	Twenties	2	Yes	13
Female	10	Thirties	9	No	3
Non-binary	1	Forties	3		
		Fifties	2		

Context of the study

The current study assumes that having children or not is a choice that can be made freely, at least in medical, legal, and political terms. However, the growing body of research on reproductive justice shows how reproduction is an issue that is tangled up ethical, legal, political, and other sociocultural conditions (Eaton & Stephens, 2020). Most importantly, being able to decide whether to have children or not, is a privilege only granted in certain parts of the world. Therefore, it is fundamental to acknowledge that the current study is situated in a Norwegian context, where reproductive rights generally are well established (Norwegian Ministry of Culture, 2019).

Data analysis

As the participants' answers to the questions about living environmentally childfree were already given in storied form, paradigmatic analysis was used when analysing the data. A paradigmatic analysis of narratives aims to identify themes, elements, or concepts across the stories that comprise the data material (Polkinghorne, 1995). The deductive type of paradigmatic analysis was used, applying two categories from Stern's (2000) framework for environmentally significant behaviour: private-sphere environmentalism and environmental activism. All instances in the data relevant to these two categories were coded and organised into subthemes, in accordance with Braun and Clarke's steps for thematic analysis (2006). Thus, main themes were derived deductively in accordance with Polkinghorne (1995), while subthemes were derived inductively in accordance with Braun & Clarke (2006), adhering to an approach where the researcher may combine analytical tools in ways that serve the research question (Watts, 2014).

The goal of the analytic process of generating codes and searching for and defining subthemes is to end up with themes that are coherent and internally consistent without being too diverse, a process that allows for a refinement of initial subthemes (Braun & Clarke, 2006). In the present article, the goal is to identify aspects of living environmentally childfree that could be related to the two main themes established a priori. Thus, all codes and later subthemes were organised under either "A private pro-environmental behaviour" or "An activist pro-environmental behaviour".

The first part of the analysis began during the transcription, identifying quotes that were deemed relevant to answering the research question. These quotes were then grouped together into codes, which were in turn used when analysing the finished transcripts. This part of the analysis generated additional statements for the initial codes, as well as quotes that were organised as new codes. Next, the initial and new codes, 92 in total, were grouped into nine subthemes. Finally, three of the subthemes were organised within other subthemes, ultimately resulting in six subthemes. The codebook with the 92 coded statements, organized under the two main themes, can be found in the Supplementary material. As the codebook shows, the codes generated from the last interviews are similar to the ones already generated, meaning that data saturation might have been achieved.

During the process of analysing the data material, codes and subthemes were presented at internal research seminars. Questions and comments from research colleagues were then fed back into the ongoing refining of codes and subthemes.

Results

The present research question asks what type of pro-environmental behaviour the decision to live environmentally childfree constitutes. The results are structured as three subthemes related to this being a private behaviour and three subthemes related to this being an activist behaviour.

A private pro-environmental behaviour

Footprint calculations

Fifteen of the participants referred to the ecological footprint of having a child. An important issue here seemed to be that no matter how green and environmentally friendly one could raise a child, every human being still has a substantial ecological footprint concerning the most basic needs. Thus, the magnitude of this behaviour in terms of environmental impact seems to be a very important part of the decision. Some participants even compared the footprint calculations of having a child with other pro-environmental behaviours one can perform in the private sphere, concluding that they wanted to contribute where their choices have the highest impact. Similarly, one participant emphasised that having a child implies an environmental impact that cannot be undone: "This [having a child] is nonetheless an extra strain on the environment, which I won't be able to cover up no matter what else I do in my life" (Participant 1).

Footprint calculations were also relevant for those concerned with adopting. They reasoned that adopting a child will not add a new human to the population, thereby not increasing the footprint. However, a few were concerned with the fact that adoption usually entails moving a child from a low-consumption country to a high-consumption country like Norway, thus actually increasing the footprint compared to not adopting. Following the same principle, one of the participants argued that the consumption rates in developed countries like Norway mean that not having one's own children is especially important here: "Adoption, for instance, is in that sense just as bad. Okay, so you don't contribute to more humans on earth, and you do move a child to better living conditions, but in environmental terms it is just as unjustifiable" (Participant 9).

Individual ethics

Issues concerning responsibility and the egoism of wanting one's own child were central to nine of the participants. The idea of an ethics based on individual responsibility seemed to come from the argument that all choices and actions matter, like this participant reasoned:

> I often hear people say their actions don't matter, since they are just drops in the ocean. But then I think that the ocean is made of drops, so all actions matter. Therefore, I cannot think, like, oh well, does it matter with one more child, what does it mean to the world if I get a child. (Participant 4)

Some participants further reflected on the fact that if one decides not to reproduce with one's partner, he or she can still have children in some way or other. One of them concluded that their individual decision nonetheless meant they themselves would not be responsible for having added a child, thus following a form of duty ethics:

> If a woman wants children, she can arrange that no matter what I would say. But that thought is a sort of diffusion of responsibility. I mean, if at least she does not have children with me, then I don't contribute to there being more children. (Participant 3)

A discreet choice

Twelve participants presented themselves as being at least somewhat open about living childfree. However, the remaining four said they are more discreet about the environmental concerns behind their choice, seeing this as highly personal thoughts, like this participant:

> People should absolutely make their own choices. Just because I think about this issue doesn't mean that I expect everyone else to do so. These are very personal thoughts, I don't want to stand on a rooftop telling people that they shouldn't have more than two children. (Participant 16)

Furthermore, some of these participants were worried that bringing up the topic could make social situations difficult, as the environmental reasoning for not having children might induce both guilt and hostility in others. One of the participants put it this way: "Should one risk to ruin the atmosphere? Maybe I am with friends of friends, or friends of my partner, and then it is a bit more difficult to be the 'party pooper'. It is easier with my own friends" (Participant 1).

An activist pro-environmental behaviour

Macro activism: political statement

Ten of the participants referred to how living environmentally childfree is a way of sending a message on the topics of climate change, environmental crises, and what needs to be done in order to mitigate them. The analysis identified three possible recipients of such a message. First, politicians, who should be bold enough to acknowledge human population as a major driver of the environmental crises, rather than trying to increase the fertility rates through pro-reproductive policies, illustrated by this quote:

> You get the impression that it is desirable with more children, when the Prime minister says what she says. One could rather use such occasions to explain the matter of ecological footprint and children. I think a lot of people don't think about that. (Participant 10)

Second, environmental organisations that should have the boldness to raise awareness on a controversial topic when politicians fail to do so, as this participant emphasises:

> What I refer to with the environmental movement, is that I wish they would bring up this topic. Yes, it is about women's rights and gender equality, but it is also about the environment. There are environmental consequences when women are not provided with reproductive health care. (Participant 12)

Third, the general public, where living environmentally childfree illustrates how we might have to accept drastic changes in our lives in order to mitigate the environmental crises. One of the participants were particularly concerned with this:

> If one could normalise the magnitude of changes needed, by showing that people choose not to have children because of this, and how that is an acceptable price to pay for having a future, then one could perhaps influence the discussions we are having. (Participant 7)

Micro activism: sharing the choice in private

Another way of raising awareness on the issues of environmental crises, ecological footprints, and reproduction, is by sharing the idea in more private settings with family and friends, which eleven of the participants said they do in some way. The goal seems to be the same, but some participants said they preferred such private sharing above more public ways of expressing their views. Two participants said this was a consequence of having been more vocal before and then deciding to back down, partly because of negative feedback. A compromise of careful sharing was voiced by this participant:

> When people who do not yet have children, say they want children, I might bring up some of my thoughts on this. So, I try, you know, but one should also step carefully, not to hurt anyone. At the same time, it might be something you feel really strongly about and want to tell people. Not because it is virtue signalling or anything, just so others also think about it. (Participant 9)

Those participants that were more vocal on the topic, stressed the importance of discussing the issue in private settings, as they see this as a way of normalising the choice to live childfree based on environmental concern. Even though people do not necessarily agree right away, this participant reasoned that the seeds of awareness will eventually grow into action:

> I thought, okay, more people need to know about this. Because I think it is not in people's minds. Like when you talk about meat, I think four years ago no one was talking about it. But then people started talking about it, and talking and talking. Then it became a big thing, and now, most people know that eating so much meat is not environmentally sustainable. So, I think we should do the same with this, because not many people are aware. (Participant 5)

Holistic sustainability

A more indirect way of understanding the choice to live environmentally childfree as an expression of activism is to examine how this choice is connected with other social practices that relate to sustainability and impact in a broader sense. Five participants gave answers related to this theme. Three of them referred to the possibility of having a child and then raising it according to their green ideals, but had concluded that there is no guarantee their efforts would result in a green child. These participants rather focused on how not having children freed their capacity to influence other people into being environmentally friendly, at both the individual and structural level. Thus, they felt that their holistic impact on ecological sustainability – beyond the mere footprint calculation of having a child – could benefit from a childfree life, as illustrated by this quote: "I can rather try to influence the children who already exist, the humans who are here already. Trying to spread environmental engagement that way instead. It does not necessarily have to be my own offspring" (Participant 1).

Similarly, these participants were concerned with the importance of caring for children regardless of whether they are one's own biological offspring. Caring for those humans who already exist, which could include participation in alternative community structures where one cares for the children of others, reflects the social dimension of a more holistic concept of sustainability. This is in line with suggestions that humans need to redefine our concepts of family and belonging (Haraway, 2018), and can be illustrated by this participant's reasoning: "One reason was that I thought there are enough children in the world. So, I thought I could rather give a home to a child that cannot live with its parents, instead of reproducing myself" (Participant 11).

Discussion

The results show how living environmentally childfree has central aspects related to both private-sphere environmentalism and environmental activism. Moreover, these aspects are not necessarily independent of each other, since precisely the magnitude of the decision as a private behaviour contributes to it being activism in form of a political statement. Thus, in contrast to the warnings about an individualistic approach (e.g. Lukacs, 2017; Pedersen & Lam 2018), the results in the current article support previous studies (Helm et al., 2021; Schneider-Mayerson, 2021) suggesting that the choice of living environmentally childfree can also be understood as activism seeking to influence structures beyond one's own immediate impact.

Specifically, one study identified a political dimension that was labelled "fertility as a socio-political tool" (Schneider-Mayerson, 2021, p. 14), where participants described, for instance, how they conveyed the climate change component of their reproductive plans to family members to influence their attitudes and political behaviour. Similarly, the current study identified activism at both the micro level (directed towards friends, family, and acquaintances) and the macro level (directed towards politicians, organisations, and society).

Furthermore, aspects of the two different behavioural types seem to be related to each other, where the magnitude of choosing to live environmentally childfree, in terms of direct environmental impact (i.e. private-sphere environmentalism), contributes to it also being a political statement (i.e. environmental activism), as illustrated by the quote from participant 7 in Sect. 3.2.1. Furthermore, this argument resonates with a point made by Helm and colleagues (2021, p. 17): "The more that climate change threat as a reason for being childfree becomes an argument in public discourse (…), the more pressure exists for political response."

Implications and future research

One of the aims of defining environmental behaviours in terms of their significance is to shift attention from intent to impact (Stern, 2000), making sure that one measures the parameters that actually have an impact on the environment. This approach is of great importance, as studies show that what is perceived as environmentally friendly behaviour does not necessarily correlate strongly with the actual ecological footprint (e.g., Csutora 2012; Moser & Kleinhückelkotten, 2018). However, it could be that the endeavour to identify quantifiable impacts (e.g. Wynes & Nicholas 2017) has led to a research agenda that is becoming too narrow. Thus, a major implication of the current study and similar studies in other contexts (Helm et al., 2021; Schneider-Mayerson, 2021) is that research on pro-environmental behaviours should widen its notion of impact. This further implies that frameworks for categorising pro-environmental behaviours (e.g. Stern 2000) might have to be revised accordingly.

The studies by Attari and colleagues (2016, 2019) are examples of such a widened notion, as they showed how a low carbon footprint also has implications for other people's intentions to conserve energy and support green public policy. Furthermore, these studies presented ways to measure beyond the immediate impacts. In their studies, vignettes that included both policy suggestions and descriptions of a climate advocate's own carbon footprint were followed by questions where the participants themselves had to indicate behavioural intentions and policy support. In this way, the researchers could interpret how differences in the climate advocate's own carbon footprint were associated with the participants' subsequent behavioural intentions and policy support.

However, it seems like such a research design is not as adequate when trying to assess the indirect impacts of pro-environmental behaviours, such as living environmentally childfree, in situations where the influence is not top-down, but rather bottom-up or between equals. Nonetheless, these effects may be essential to understand how collective, sustainable change could come about. Identifying such effects might demand research approaches that go beyond behaviours and impacts that are easily accessible and measurable. Such approaches are encouraged by a recent article on how psychology can help limit climate change (Nielsen et al., 2021). It emphasises the importance of how individual action might influence social structure, culture, and public policies, as well as how psychology could include such topics by recognising units of analysis that reach beyond the individual level.

It is important to note that some existing research within environmental psychology does indeed reach beyond the individual level. For instance, a meta-analysis revealed a strong link between social identity and pro-environmental collective action (Schulte et al., 2020), while another study found that social identity, collective efficacy, social norms, and group-based emotions determine intention to participate in collective climate action (Rees & Bamberg, 2014). Similarly, the social identity model of pro-environmental action proposes that in-group identification, norms and goals, and collective efficacy determine both private and public sphere environmental action (Fritsche et al., 2018). However, these studies have established determinants of collective action and activism, not investigated how such actions affect social structure, culture, and public policies, as requested by Nielsen and colleagues (2021). In other words, much of the existing research addresses the determinants of activism, while the impact of activism seems less explored.

In general, research on pro-environmental behaviours should acknowledge that a behaviour can be environmentally significant in more than one way. If researchers follow the advice presented by Nielsen and colleagues (2021), it might be possible to include the impact of and influence on social structures, while at the same time avoiding the failures of focusing on psychological intent instead of environmental impact (Stern, 2000). Research that identifies ways to assess the consequences of pro-environmental behaviours beyond the immediate, individual level would be highly valuable, and could build on the work by Attari and colleagues (2016, 2019).

Furthermore, to reach truly beyond the psychological variables, research on individual and collective pro-environmental action should also be informed by the work of sociologists, anthropologists, and historians (Nielsen et al., 2021). Such interdisciplinary approaches represent exciting opportunities, integrating environmental psychology with, for instance, social network analysis (e.g., Saunders 2007) or using the transactional model (Sameroff, 2009) to understand how activists and contexts constitute and shape each other. A concrete example is a study that explored the role of social identity in institutional efforts to improve cycling infrastructure (Becker et al., 2021). Combining social psychological models and sociotechnical transitions theory, they concluded that transition processes should minimise the creation of social outgroups. Regarding the specific topic of living environmentally childfree, social network studies could illuminate how reproductive considerations and intentions are spread (or not) in different social groups. Such studies could also include the Norwegian media coverage on the topic (see Nakkerud, 2021b; Kristensen, 2020), as this coverage potentially influences the very same considerations and intentions that it covers.

More specifically, psychologists could work with political scientists and historians to see how activism influences the legislative, executive and judicial branches of government,

as well as corporations. A recent example includes the oil giants *ExxonMobil* and *Chevron*, where fund activists replaced two board members with greener candidates and voted for cuts in carbon emissions, respectively (Ambrose, 2021). Another example includes a recent court case in the Dutch city of Hague, where a court ordered the company *Royal Dutch Shell* to cut its carbon emissions by 45% by the end of 2030 (Boffey, 2021). These examples represent cases where the influence of fund activists and environmental organisations could be studied, from the birth of an initiative to the victory at an annual meeting or in court. Such a research agenda would require that psychologists go beyond research designs primarily built on experiments and surveys and instead view society's ongoing and complex processes as a natural experiment that in itself should be relevant for our understanding of environmentally significant behaviours. While this experiment offers no experimental control, there is a remarkable upside in its ecological validity.

Regarding future research on the specific topic of choosing to live environmentally childfree, researchers should also pay attention to how other people perceive this as a pro-environmental behaviour, including any potential indirect influences that living environmentally childfree has on activism, policies, and other aspects of society. In other words, rather than trying to categorise what kind of pro-environmental behaviour living environmentally childfree constitutes, one should explore how a phenomenon like living environmentally childfree is represented and what its socio-political implications are. This includes an awareness of how the idea of linking reproductive and environmental issues might represent contemporary forms of population control (Bhatia et al., 2020).

Limitations of this study

The discussion above emphasises the need to study impacts and influences beyond the immediate, individual level. However, the present study does not assess such impacts and influences, making it yet another example of research that insufficiently addresses these wider perspectives. More specifically, the claim that living environmentally childfree has aspects of environmental activism is based on the participant's own stories and does not consider whether other people indeed perceive this as a legitimate pro-environmental behaviour. Thus, it is not possible to conclude that the identified aspects of activism do have an environmental impact.

Another limitation has to do with the analytic process, where the author was the only person involved in coding from the transcriptions. Codes and themes were shared and discussed with research colleagues during this process, but the solitary analysis is nonetheless a possible limitation regarding the trustworthiness of the results.

A third limitation is the lumping together of interviews with both individuals and couples. The dynamics of these two types of interviews can be very different. For the current topic, they arguably even constitute two different phenomena. Further research should take this into account.

A fourth limitation is concerned with the comparison between private-sphere environmentalism and environmental activism, where there was no aim to conclude which of the two main themes is more dominant in the participants' narratives. Rather, the analysis simply show that the choice of living environmentally childfree has aspects of both private-sphere environmentalism and environmental activism.

A fifth limitation of the study is related to how exploring a phenomenon based on Stern's (2000) framework for environmentally significant behaviour might reinforce individualised understandings and perspectives, a critique relevant for much contemporary research and practice within psychology (Adams et al., 2019) and environmental psychology (Adams, 2021). Even as the discussion above attempts to address some of the limitations of this framework and suggest how environmental psychology should move from computation and categories to context and complexity, one could still object that this article nonetheless has explored the choice of living environmentally childfree as an individual behaviour.

A sixth limitation is concerned with context and generalisability. While generalisability across contexts is an issue with most psychological research, this is especially true for the current topic, as it is related to a plethora of ethical, legal, political, medical, and other sociocultural issues that vary greatly across the world. Thus, as the study is restricted to the Norwegian context, the results cannot say much about how the phenomenon is represented in for instance developing countries with different access to reproductive health care. Furthermore, the study's sampling strategy, where most of the participants were recruited through social media, may not fully reflect the diversity of perspectives on the topic. Similarly, the decision to include mostly females within the reproductive window, probably produced different results than what a more diverse sample would have. Thus, a stronger purposive sampling strategy could have increased the quality of the results.

Conclusion

The aim of this article was to explore how the choice to live environmentally childfree could be categorised as a pro-environmental behaviour in a Norwegian context. The results show that living environmentally childfree has important and relevant aspects of both categories applied in the deductive analysis: private-sphere environmentalism

and environmental activism. This suggests that pro-environmental behaviours might be significant in more than just one way, resonating with similar research done in different contexts (Helm et al., 2021; Schneider-Mayerson, 2021).

There are two major implications of this study. First, the case of choosing to live environmentally childfree could be understood as activism and thus have impacts beyond the mere impact of not having children, potentially influencing other people and socio-political processes. Second, this interaction of impacts should have consequences for how pro-environmental behaviours are studied and theorised, emphasising the need to go beyond the immediate, individual level when assessing environmental impact.

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Data availability The transcripts analysed during the current study are not publicly available due to the controversial character of the data but are available from the corresponding author on reasonable request.

Declarations

Conflict of interest The author has no financial or proprietary interests in any material discussed in this article.

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