

Pregnancy Intentions of Youth in the Era of Climate Change: A Qualitative Auto-Photography Study

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Abstract

Background

Climate change poses a global health risk through consequences such as sea level rise, wildfires, and increased air pollution. Children born today and in the future may be disproportionately affected by climate change. As a result, many young adults are rethinking having children. The impacts of the climate crisis on the decision-making of parents is an understudied area of research. This study aims to be one of the first to explore how climate change impacts the pregnancy intentions of youth and their perspectives towards childbearing.

Methods

We conducted auto-photography and qualitative interviews. Participants were recruited using social media, and were aged 18-25, nulliparous, assigned female at birth, and were either current or previous residents of British Columbia, Canada. We asked participants to take photos that responded to the question, "Show us how climate change impacts your decision to have a family," then complete a virtual, one-on-one interview during which photo-elicitation was employed to guide conversation about participants' decision-making related to childbearing and climate change. We subjected all transcribed interviews to qualitative thematic analysis.

Results

We conducted in-depth interviews with 7 participants who discussed a total of 33 photographs. Analysis of participants' interviews and photographs identified themes of eco-anxiety, hesitancy towards having children, and a desire for systemic change. Participants experienced anxiety, grief, and loss when faced with thoughts of change associated with their environments. Climate change was a consideration for many participants in their childbearing decision making, and it was interrelated with social-environmental factors, such as cost of living.

Conclusion

We aimed to identify the ways in which climate change may impact youth decisions to have a family. Responses ranged from feeling that climate change had no effect on family planning to choosing not to have children entirely because of climate change. Further research on this topic is needed in order to direct climate change policy.

Background

Climate change is a critical health crisis. Its effects on the environment and communities are well-documented and include sea level rise, disruptions to food supply chains, and increased air pollution (1). Recent research indicates that without aggressive action, children born today will be disproportionately impacted by climate change compared to older generations (1). As a result of these potential

consequences on future generations, along with slow and limited global policy action, young adults are putting pressure on governments through mass protests (2). In addition, many young adults are rethinking decisions to have children in a future of uncertainty (3, 4). Reports in The Guardian and BBC News illustrate how such movements as “No Future No Children”, “Conceivable Future”, and “Birthstrike” exist both in Canada and abroad and are composed primarily of young adults who claim that climate change is a large factor in their decision to have children (5, 6). There have also been recent peer reviewed articles on this topic, highlighting increasing concern among individuals about having children in the context of climate change (7, 8) .

Much of the previous research investigating the intersection of climate change and childbearing primarily focused on family planning to slow carbon emissions. For example, a previous study used analytical models and simulations to show that by choosing to have one less child, an American woman can reduce the sum of carbon emissions produced by her and her descendants by 9441 tons (9). However, research regarding this “population factor” as a mechanism to curb climate change has been criticized for suggesting that women’s reproductive rights should be ignored to fight climate change (10). Indeed, the idea of population control as a factor for mitigating climate change has drawn much criticism from global communities, including environmentalists (10).

There is a scarcity of empirical research investigating the effects of climate change on young adults’ childbearing decision-making. A 2020 study conducted by Schneider-Mayerson *et. al.* highlighted how 59.8% of American survey respondents aged 27–40 reported being “very” or “extremely concerned” about the carbon footprint of childbearing (11). In addition, many participants stated that their future children's carbon footprint had led them to have (or plan to have) a smaller family (11). A Canadian study completed in Thunder Bay, Ontario, also highlighted reproductive intentions and environmental thinking among university students. The study, done by Arnocky *et. al.* found that environmental concern as measured by the “New Ecological Paradigm” was associated with a lower fertility intention (12). Two recent articles involving interviews with adult couples in Norway and young adults in New Zealand and the USA regarding their intentions to be “environmentally childfree” in the context of climate change. Both highlighted how climate anxiety is increasingly affecting peoples’ decisions to bear children and alluded to the growing implications of climate anxiety and pessimism on their reproductive decision making (7, 8).

There are many reasons why climate change may impact the decision to have a family. The climate crisis has been linked to repercussions on mental health such as depression, anxiety, and post-traumatic stress disorder (PTSD) (13–15). The term “eco-anxiety” has been used to describe a debilitating worry about current and future losses related to climate change (14). Further research has identified certain populations in North America that are already facing mental health repercussions of climate change. For example, a multi-year, community-driven case study situated in the Inuit community of Rigolet, Nunatsiavut, Canada, illustrated how the Inuit are disproportionately affected by climate change, with feelings of loss associated to changes to their environments (16). Other qualitative research indicates there are increased reports of PTSD in individuals that experience extreme weather events, such as

hurricanes and wildfires (17, 18). Despite this emergent body of literature, there is limited research on youth who are undecided on their childbearing intentions in the context of climate change.

The decision to have a child is multifactorial, and the implications of the climate crisis on an individual's childbearing decision is understudied, especially in Canada. We aimed to investigate how climate change impacts the pregnancy intentions and preferences of youth and their perspectives towards childbearing. Our study will help inform environmental research and ultimately aid in informing health policy regarding climate change.

Methods

In this study we used auto-photography to explore participants' perspectives towards future pregnancy and parenthood in the context of climate change. Auto-photography is an ethnographic method that employs visual methodologies to understand the perspectives of research participants with respect to a specific research question (19). This visual methodology is unique as it provides researchers a view into how participants perceive their environments and allows participants to speak for themselves.

This study took place in British Columbia in the summer and fall of 2020. In accordance with local public health recommendations in the context of the coronavirus pandemic, this study was conducted using virtual software. As such, there were no restrictions on participant location within British Columbia.

Sample

Participants self-recruited to the study using social media platforms (Twitter, Facebook, Reddit) on which the study was advertised. The posts invited participants to contact the research team for further information on the study. Participants were eligible if they were between the ages of 18 to 25, nulliparous, assigned female at birth, had resided in British Columbia at any point in the past five years, and spoke English. We do not report participant demographic characteristics in this study to protect the anonymity of our sample.

Data collection

Participants that responded to the social media posts were provided with information on the study and provided consent forms for participation. Eligible participants were asked to take 3–5 photographs in response to the statement: "Please show us how climate change impacts your decision to have a family, then rank these photographs from least to most impactful." Photographs that contained copyrighted material or identified other individuals, including the participants, were excluded from the study.

Once the study team received the photos, participants were scheduled for interviews using virtual video-conferencing software (Zoom). Participants then completed an approximately 45-minute photo-elicitation interview using open-ended interview questions adapted from Lin, *et. al.* (2017) (Supplementary file 1). Study team members DS and JS, who had no prior relationships with any of the study participants, conducted interviews. Interviewers used photo elicitation techniques (20–22) to analyze photographs

with participants to create rich, collaborative interview data. With each participant, we looked at their photographs together over the course of the interview to generate discussion and co-create knowledge and interpretation. We sought to explore different layers of meaning through this method, from latent, visual descriptions of each photo to interpreting what each represented, including participant emotions, memories, and ideas. Interviews were audio-recorded and transcribed using a Canadian transcription service (Advanis). Each participant received a \$50 honorarium.

Analysis

Study authors SM and AW independently coded a sample of transcripts ($n = 3$) to create preliminary codebooks, which they then discussed and collated into a coding framework. We identified and developed themes related to the study question following principles of reflexive thematic analysis (23). AW then utilized the final coding framework to code all interviews. We used NVivo for Windows to organize the analysis. Throughout the research process we engaged in verification strategies to promote reflexivity, including keeping an audit trail, and practicing self-awareness of our identities compared to those of our participants. Photo elicitation interviews contributed to the trustworthiness of our findings as a member checking technique. We also met through multiple team meetings to critically reflect on the data and discuss our assumptions and possible biases.

Results

Seven participants participated in interviewees and shared a total of 34 photographs (Supplementary file 2). Our analysis of photo-elicitation interviews identified 5 key themes related to climate change and childbearing: planning for a “dire future,” experiencing anxiety, catalyzing events, feeling like an outlier, and calling for systemic change.

Planning for a “Dire Future”

Six of the seven participants stated that climate change either has already affected or may affect their decisions to have children. Two of these six stated they would not have children due to climate change. One of the participants was worried about the effects of climate change on their future children: “I probably wouldn’t want to have children even if I had the chance because of just the dire future that I’m predicting.”

In contrast, two participants ultimately wanted to have children despite the effects of climate change. One of them felt that while climate change was important, it did not factor into their decision to start a family: “We had this discussion, and there’s a lot of valid points either way. Basically, climate change is not one of the reasons why I wouldn’t have a child.”

While participants identified climate change as an important factor in future decisions to have children, many also spoke to other factors that would affect their decisions to have a family. These included their age and perceived life stage, the presence of a supportive partner, emotional support, and financial stability: “It’s important to just have, like, a really strong—for lack of a better term—bank account because

if you, you know, like, not only are you caring for yourself; now you are caring for another person, another dependent, and you have to get food on the table.” Even when other factors were taken into consideration, ultimately the extent of climate change impacts on nature and their potential future children was an important deciding factor for the desire of one of the participants to have children (see Figure 1). As one participant described:

Even, like, given every other positive factor, like a supportive partner or financially stable, like even if I had all of those things, I probably still wouldn't want to have kids. [...] Just because, I mean, you can be financially stable and have a supportive partner and still not be able to provide that experience with nature in the outdoors.

Experiencing anxiety

Almost all participants characterized their feelings as “anxiety” and dread when discussing a future affected by climate change. Participants expressed negative feelings about current events related to climate change, using multiple negative adjectives such as “unsettled,” “gloomy,” “concerned,” “anxious,” “afraid,” and “helpless.” As seen in Figure 2, many participants connected these emotions with photographs they took of the wildfire smoke that affected large swaths of the Pacific Northwest, including Vancouver, during summer 2020 (see Figure 2): “Yeah, I felt, like, scared. Like, the outside now, one, we couldn't go outside already because of pandemic, but now we can't even get, like, any fresh air because of the smoke, so I felt very restricted and a bit helpless.”

Some participants alluded to feeling powerless against the increasing rates of extreme weather events. When reflecting on their potential futures, some expressed feelings of a lack of control: “It feels very much out of my hands. So there's definitely times when I feel, you know, kind of helpless. Like you can do what you can do in your sphere of influence. And beyond that, it feels kind of, like, I'm just shoved down into the void.”

Many participants spoke to a sense of preserving nature and wanting to share it with their future children. They expressed a sense of loss or disappointment when reflecting on aspects of the environment that they may no longer be able to share with current and future generations of youth: “Even kids now just not having nature accessible, like I've had it accessible in so many different ways, like kayaking or hiking or snowboarding. It's just, it's something I had the privilege to experience, and I don't foresee [...] future generations having that nature accessible to them the way I have had it.”

These negative emotions were pervasive across multiple interviews and often featured places that figured prominently in the participants' childhoods. As one participant reflected, referring to Figure 3, “My dad would tell me stories of swimming across the river or playing in the river. It seemed to at least figure prominently in his childhood. And I think just, it makes me really sad to hear that, like, this river is shrinking or receding and becoming more polluted.”

However, not all participants related these feelings of anxiety solely towards climate change. One participant acknowledged that their current views on climate change and childbearing may be influenced by pre-existing anxiety: “I’m generally a worried person. I feel like because of that, it may impact the way that I’m viewing just maybe climate change in general or the stuff that I’m studying or reading on a daily basis probably impacts the way that I’m viewing having a child in this time.”

Catalyzing Events

Some of the participants identified specific life events or experiences that influenced and led to a change in their perception of climate change and childbearing. To one participant, the effects of last year’s wildfires was a new experience that provoked reflection through Figure 4: “I think I’ve never really experienced this extent of an environmental crisis directly within my sphere of the world, so it was really shocking to see this actually impact, like, my personal life and made me reflect how my life will be in the future.”

Other important events included schooling, experiences with family and friends, and exposure to environmental advocacy such as climate strikes. Participants identified the importance of early introduction to nature, either through school or family. Another participant spoke of the impact of being in a community who introduced her to nature-based activities, and reflected in Figure 5 on the differences between that and her previous life before moving to Canada from the United Kingdom: “I think this photo just reminds me that I came from a very small place to a very big place, and when my eyes were opened to more extreme conditions and, like, just other ways of living.”

Participants spoke to the significance of these events with respect to their understanding of climate change. Indeed, one participant noted that exposure to different things made her feel less “ignorant” and opened her eyes to the impacts of climate change: “It just seems a bit like ignorance. “Before I knew, but now I know that,” you know. [...] just broadened my mindset so much since coming to university. I don’t think that is specific to Canada.”

Another participant was able to reflect on being in nature and have a self-described “epiphany” while on a school organized trip (Figure 6). To this participant, this experience reinforced not only their desire for future offspring to have the same experience, but also their stance toward protecting nature.

Coincidentally, this study was conducted over a period where the California, Oregon, and Washington wildfire smoke spread into Vancouver and surrounding areas may have impacted feelings of anxiety for many participants. Indeed, four out of seven participants shared photos highlighting smoke or fog, and how they would not want to share a future impacted by these events with their offspring (Figure 7).

While the wildfire smoke was featured prominently, participants also shared other photos that highlighted weather events that made them feel unsettled, including heavy snow falls and moth infestations. One participant reflected on their photo of smoke from a seasonal wildfire (Figure 8), “I find that, like, in their

presence, in just how many of them they were. I don't know. It seemed like a pretty out of whack or unnatural or really freak phenomenon."

Feeling Like an Outlier

Many participants shared feelings of a divide between themselves and other members of their families, older generations, or even other peers with respect to childbearing. As one described, "It was a group of four, so me and three other girls, and we were all, you know, in a hotel room for a school field trip, and that was this conversation, and all of the other three girls were really set on having kids, so when I shared that, they were just shocked. [...] That I wouldn't want to have kids."

Others felt supported when close associates or other family members felt similar towards thoughts of having children in the context of climate change:

My sister said, like, 'Oh, I'm scared for what the future will look like and what the people in the future are going to be like and what they'll have to suffer through [...] I was, like, 'One, if we do have a future.' Like, if I do even have the chance into, yeah, I probably wouldn't have children because of that, and they were actually, like, pretty content with that, like, understanding of it, which I guess is a little surprising. But, yeah, they seemed to be on a similar plane as me.

When reflecting on landscape that had been changed by logging and developmental projects (Figure 9), one participant also alluded to a divide between younger and older generations with respect to climate change: "I do think there is a big gap or disconnection between the younger generation because, compared to the older one, because I can't really say exactly, but I feel like my parents or my parents' generation didn't really take climate change that seriously."

Calling for Systemic Change

Two of the seven participants did not want to have children unless systemic change to address climate change occurred. They expressed calls for policy change and government action: "[If] new climate change policies have been enacted ... there's proof that it's being enforced, then I'll be hopeful and perhaps change my stance on having children in the future."

Participants shared potential plans or ideas of how they hoped to tackle the climate crisis at an individual level and adaptive behaviors they want to share with their future children. These included passing down behaviors that are beneficial to the environment such as recycling, eating less meat, limiting their family to two children, and choosing to live outside the downtown core: "So even, whether that's recycling or, you know, buying vegetables that aren't in plastic packaging and things like that, but also not buying loads and loads of fast fashion. I don't do that anymore. I choose, like, sustainable brands."

Many spoke directly to the need for systemic, global coordination and change on a larger scale that, if enacted, would change their decisions to have children in the future: "I think if there were governments in place that prioritize climate change and the environment, and it seemed like that was a priority globally. I

think that would make me change my mind.” One participant in particular spoke to a feeling of hope and encouragement when thinking of new technologies and innovations that are being created to tackle climate change (Figure 10). They described feelings of their small actions in comparison to corporations who have a larger impact on climate change: “Elon Musk, obviously he has, like, lots of money. He has lots of influence. He is well respected and well known, so basically, if he is, if he can a voice for innovation and he can, basically, like rally people and encourage them to be considerate of their environmental impact, then looking at his product—like a Tesla car—encourages me to remember that.”

Discussion

This study highlights the variables that young people may consider when deciding to have children in the era of climate change. Participants’ interviews and photographs illustrated eco-anxiety, hesitancy towards having children, and a desire for systemic change. However, while climate change was a consideration for many participants in their childbearing decision making, it was not the sole determining factor.

Participants in our study spoke to a hesitancy towards having children because of climate change, and often reflected on environmental changes that were already occurring in the present day. Many of the photographs shared, such as Fig. 2 “A place it used to be,” were of locations tied closely with participants’ childhood and highlighted strong place-based ties to their identities and values. Participants often discussed these photographs with a sense of loss and sadness, as their future children may be unable to enjoy these experiences to the same extent as they did because of climate change. This notion of loss associated with changing environments has been found in previous studies, such as the work by Cunsolo et al. exploring the effects of negative effects of climate change on members of an Inuit community in Labrador (16). Their study highlighted the connection between a person’s place and overall well-being (16). Indeed, the term “Solastalgia,” previously defined in literature as “the pain or sickness caused by the ongoing loss of solace and the sense of desolation connected to the present state of one’s home and territory”(24) was highlighted by participants in our study as they reviewed their photographs. Future studies on this topic may benefit from identifying other ways in which changing landscapes play into the complex decision making related to childbearing among youth in this context.

Our findings add to recent qualitative research on the impacts of climate change on childbearing in young adults (7, 8). A recent study by Nakkerud (7) highlighted how singles and couples in Norway experienced childbirth decision-making as a choice “in development” – making the choice, sharing (disclosing) the choice, and integrating the choice into one’s life and relationships. However, that study focused on a population of adults who were actively making or had made childbearing decisions, and the authors used a semantic analysis approach to describe their choices. Our study sought to go beyond description to provide interpretive insight into the motivations for childbearing decisions among a younger population, and how those choices intersect with other considerations, like cost of living. Research by Helm *et al* (8) involved an approach similar to our study and involved semi-structured interviews with 24 adults aged 18–35 in the USA and New Zealand to explore the role of climate change considerations in the formation of reproductive attitudes and motivations for going childfree. That study reported participants’

motivations for childbirth decision-making were related to societal level climate challenges, namely overconsumption and overpopulation. In contrast, data from our study highlighted the relationship between participant motivations and their personal, embodied relationships with the environment – how climate change will impact a child's ability to swim in a cherished lake or go camping with other students. These experiences were characterized by a feeling of grief, as participants anticipated that the experiences they had as children would not be possible for their own children in future because of climate change. Our use of autophotography may explain how our data focus on personal, rather than societal, motivations for childbearing preferences, as this arts-based method involves the generation and interpretation of images that best represent the individual participant.

By combining autophotography and photo elicitation techniques, our study explored how key experiences and emotions can influence individual attitudes toward childbearing and climate change. The photos shared by our participants often evoked reflection on their experiences in nature, which typically brought up feelings of anxiety and fear for a future where this sort of connection may not be possible for their children. Indeed, eco-anxiety was a prominent theme in this study and was pervasive in almost every interview. This notion that youth are being faced with existential realizations with respect to climate change is something that is shared among other peer-reviewed literature on this topic (7, 8, 13). Indeed, the effect of climate change on youth mental health has been highlighted in other studies which show that climate associated fear and distress may negatively affect overall mental health among youth (25, 26). This further highlights the need for action on climate change as it continues to affect youth wellbeing, and ongoing research on this topic is needed to quantify the effects of climate change on mental health.

While feelings of loss, grief, and anxiety featured prominently in our results, there was hope and optimism among some participants. There are other reports in climate change literature that highlight the importance of hope as a vital requirement for youth to feel motivated for action and change (13, 14). The recent increase in global marches, school strikes, and advocacy movements led by youth highlights the increasing desire for systemic change and advocacy among today's youth. The degree to which climate change policy action affects youth desires to have children is not currently well-studied. Whether participation in these global advocacy movements affects young people's decisions to have children would be interesting to further explore through ongoing research in this area.

We acknowledge some limitations within this study. First, this study was conducted with a geographically restricted sample, which may limit its generalizability to audiences outside western Canada. However, our purposeful sample allowed for a rich description of participants' lived experiences, emotions, and perceptions of childbearing and climate change. To that end, our study may allow for a more detailed analysis of youth perspectives with respect to this extraordinarily complex decision. Secondly, we recruited people on social media sites that may have drawn youth that were focused on climate change more than the average youth in BC. While we did not specifically target websites that focused on climate change, those who are more passionate about climate change may have been the ones who were more likely to seek out and self-select to our study. Lastly, our study did not focus on the perspectives of men,

non-binary, or Two-Spirit people with respect to childbearing and climate change. While other studies on this topic have not restricted participation based on sex or gender, our study included young adults who identified female at birth (cis women, trans men, and non-binary people included) and considered climate change in their decision to bear children. In the next phase of our research we plan to explore perspectives of other sexes.

Conclusion

With this study, we aimed to explore how climate change may impact youth decision making to have children. Responses ranged from feeling that climate change had no effect on family planning to choosing not to have children entirely because of climate change. Most participants expressed apprehension about the future both for themselves and their potential offspring due to the environment. This study is important for future research into the complex decision of childbearing among youth and may help to direct climate change policy and research in the future.

Declarations

Ethical Approval and Consent to Participate

This study was approved by the University of British Columbia Behavioural Research Ethics Board (H20-01805). All methods were carried out in accordance with relevant guidelines and regulations. All participants provided written informed consent to participate.

Consent for Publication

Not applicable

Data Availability Statement

All anonymized data generated or analysed during this study are included in this published article and its supplementary information files.

Competing Interests

The authors declare that they have no competing interests.

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Author Contributions

Authors DS, JS, and SM developed the study idea while authors DS and JS conducted the initial literature review. Authors DS and JS conducted interviews with participants and SM and AW performed data analysis. The manuscript was written in collaboration between DS and JS with final editorial review by SM and AW. All authors have read and approved of the final manuscript.

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Figures



Figure 1

Contaminated water, Participant 2



Figure 2

Hidden beauty, Participant 7



Figure 3

A place it used to be, Participant 4



Figure 4

Wildfire smoke, Participant 3



Figure 5

Trying new experiences wherever you can, Participant 5



Figure 6

Untitled, Participant 7



Figure 7

How far can you really see what's ahead of you?, Participant 5

Figure 8

Lord of the Moths, Participant 4



Figure 9

The land bears scars, Participant 4



Figure 10

Material innovation, Participant 1

Supplementary Files

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