

## **Author Final Draft**

### **Understanding how children are coping with climate change anxiety by exploring coping strategies and supportive interventions**

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## **Abstract**

Climate change presents a significant threat to both the planet and human prosperity which impacts our physical health and mental well-being. There is an imminent requirement for significant global action. This means (a) our children have been born into unprecedented times and (b) as future adults, they will find themselves facing the major consequences of climate change. These can negatively affect their mental health and well-being. This paper reports the effect of climate anxiety on this population group through an exploration of coping strategies and supportive interventions. Empowering children to engage in climate action has been identified as a coping strategy. Whilst equipping them with knowledge and resources on climate change and providing safe spaces and experiences in nature are identified as supportive interventions. However, further empirical research evidence is needed to determine the next steps to address the extent of the impact of climate anxiety and prepare our children for the future.

**Keywords:** Children; Climate change; climate anxiety; well-being; coping; interventions.

## Introduction

The Intergovernmental Panel on Climate Change (IPCC, 2021) Sixth Assessment report confirms that the climate is changing, a change caused by the release of greenhouse gasses from human activities, which are warming our planet. Between 1901 and 2020 global temperatures increased by 1.1°C (NOAA, 2021) and as a consequence, we have seen rising sea levels, droughts, wildfires, biodiversity loss and flooding which in turn affect human health. Power generation, manufacturing, growing transportation networks, overconsumption of resources, food production and deforestation all contribute to human-induced climate change. With increasing populations placing further pressure on the planet and a misplaced commitment to economic prosperity there has historically been a slow response to addressing the causes.

Recently we have seen a shift in thinking towards a zero-carbon future and global commitments to change, however, further, and more urgent action is needed. This imminent requirement for significant global action means our children have been born into unprecedented times. Indeed, UNICEF (2021) highlights that one billion children will be at extremely high risk of stress caused by climate change. This could be a direct impact of living in a changing environment (Xu *et al.*, 2023) or population displacement (Palinkas, 2020). It can also be from an indirect impact on exposure to media reporting on catastrophic extreme weather events (Robie and Marbrook, 2020). These experiences have the potential to significantly impact the way our children make sense of their world. Combined with their looming position as our next generation of adults but with no current agency to implement the urgent action needed to attempt to reverse the impact of human behaviour on the environment caused by the generations who came before them. If our children are to cope with these global challenges,

we must do what we can now to understand how this is impacting them and how best to support them.

Climate-induced impacts on physical health have been widely discussed (IPCC, 2022; WHO, 2021) and people have become more aware of it negatively affecting their health in the long term (Berry *et al.*, 2018). Children are particularly vulnerable to the effects of exposure to climate change such as heat waves (Dreisbach, 2019). The enormity of the challenges global populations face from the changing climate is also “creating stressors that worsen the mental health of individuals” (Meier *et al.*, 2022 p.6). Indeed, it is considered that climate change is “the biggest threat to global mental health in the coming century” (Charlson *et al.*, 2022 p.6) as both the physical impacts, as well as the anticipation and perception of climate-induced events can influence mental health (Clayton and Karazsia, 2020). The relationship between climate change and mental health is an area that has been identified for further investigation (Berry *et al.*, 2018). Prencipe *et al.* (2021) and Majeed and Lee (2017) specifically highlight the paucity of research concerning the impact of climate change on children's mental health and well-being. Mental distress about climate change is commonly referred to as climate anxiety and includes a notion of the inadequacy of the human response and resources (Rothschild and Haase, 2023). Children are reported as particularly vulnerable to climate anxiety (Wu *et al.*, 2020) and qualitative research has explored children’s experience of this. In clinical and research settings Hickman (2020) reports that children commonly express feelings of severe anxiety, fear, guilt, shame, being misunderstood, betrayed and abandoned by adults, together with associated rage towards and blaming of adults. Strife (2012) reports that the majority of the 50 children interviewed expressed apocalyptic and pessimistic feelings. There is also a study in which both parents and educators specifically identify climate anxiety children (Baker *et al.*, 2021).

Unique characteristics of climate anxiety are that (1) it is rational (therefore is unfit to the traditional criteria for anxiety disorders (Kotera and Taylor, 2022) because it is a practical response to the possibly life-threatening phenomenon, driving the person to take preventable actions, and (2) it is complex and can be detrimental because the person cannot make a considerable change to the possibly life-threatening phenomenon (Kotera *et al.*, 2022). Therefore, this paper aims to explore how children are coping with climate anxiety and the possible interventions to support them. Lastly, it will identify gaps in understanding the impact on the well-being of this population group.

### **How children are coping with climate-anxiety**

How children cope with climate change and climate anxiety is an area of research attracting increasing attention. Through a narrative synthesis of 51 studies into youth perceptions of climate change, Lee *et al.* (2020) reports that younger children (11–16 years) have been shown to exhibit higher climate change concerns than older children (17–18 years), and primary age children show more willingness to address climate change than secondary age children. Swim *et al.* (2022) demonstrate that this trend increases the more distant the generation. There is a growing body of evidence supporting engagement with climate change as a strategy for coping with associated harmful psychological effects. For instance, van Nieuwenhuizen *et al.* (2021) suggest joining children in support of pro-environmental behaviours and activism. Sampaio and Sequeira (2022) recommend community climate action to promote efficacy and hope.

Climate activism is theorised to relate to positive coping strategies of problem-focused and meaning-focused coping, rather than avoidant coping strategies (Ojala, 2012). Similarly, efficacy beliefs in themselves have been also shown in Italian university students to be positively associated with climate anxiety (Maran and Begotti, 2021). Meaning-focused coping is a critical enabling strategy to facilitate problem-focused coping whilst protecting against

overwhelm and stress induced by engaging in climate change activism (Ojala and Bengtsson, 2019). Although studies with children in different countries support these theoretical coping strategy interactions it is yet to be determined whether they may vary between cultures. Hickman (2020) is clear that societal trust is lacking in many children, demonstrating the need to address intergenerational misunderstanding. Taking as an example, the platform given to Greta Thunberg by the U.N.'s Climate Action Summit in 2019, it is evident that for children to feel hopeful and empowered they must be enfranchised through representation in the media and policy creation; a sentiment voiced in qualitative research with UK adolescents (Thompson *et al.*, 2022).

Jalin *et al.* (2022) identify a particular risk of climate anxiety in individuals with insufficient psychological resources to effectively cope with stress, recommending psychotherapy focus on stress management as a means to improve climate anxiety coping mechanisms. As Clayton (2020) observes, emotional coping strategies, such as denying or diminishing the threat, are not appropriate for the pervasive threat posed by climate change. However, for those experiencing significant impact from climate anxiety, stabilising unregulated emotion and stress through cognitive exercises is likely to be a necessary preliminary to engagement in meaning- and purpose-focused coping.

### **When to talk to children about climate change**

The consensus of when is the appropriate time to discuss climate change with children is not clear. Understanding that extreme worry, fear and distress can be associated with concerns about climate change in children is a start (Marks *et al.*, 2021). Consequently, unpacking and discussing climate change and its impact must be engaged sensitively and in an approach that will equip children to feel empowered to adaptively engage in the process of action as opposed to feeling helpless and powerless (Budziszewska and Jonsson, 2021). Parents and guardians

who provide advice and support to children can find this a daunting experience due to parent's anxiety concerning climate change or parents feeling ill-equipped to provide scientific information in a child-appropriate manner (Gaziulusoy, 2020). Providing guardians with resources that are educational and encourage emotional well-being has been identified as an effective approach to fostering discussion with children to support them to proactively engage in climate change action (Baker, Clayton and Bragg, 2021).

Reducing the impact of climate change and assisting children to be part of this process requires a collective approach and collective action (Lawson *et al.*, 2019). Therefore, the role of empowering children to take action to reduce climate change should not only be left to parents but must include educational systems such as schools and colleges, governments, researchers, clinicians and practitioners who work with families as well as community activists. Majeed and Lee (2017 p.95) recommend that “researchers and clinicians treating children with mental illness should familiarise themselves with the potential ways in which climate change has already impacted mental health outcomes”. This approach will allow practitioners to work in an evidence-based approach concerning climate change anxiety as psychological treatment approaches to working with children who present with climate change anxiety must be treated differently than the presentation of other anxiety disorders such as generalised anxiety disorder.

### **Possible interventions to support children with climate anxiety**

Potential consideration for interventions, but are not limited to, providing safe spaces (online or regionally), resources and tools for parents to share their fears or concerns about climate change and acknowledging that these feelings do exist, and can assist to address any silence, fear, shame experienced by the parents’ feelings (Burke, Sanson and Van Hoorn, 2018). Additionally, support is needed for parents to overcome fears concerning not having scientific knowledge to be able to share it with children. Lewandowsky, Gignac and Vaughan (2013)

argue that the gap between expert knowledge and public knowledge should be closed so that the ‘public’ including parents, guardians, schools and communities have access to expert knowledge and designed resources to support children.

Creating environments where parents can spend time with their children that encompass nature, to enable children to experience the beauty of nature, rather than simply talking about climate change has also been shown to be beneficial (Burke, Sanson and Van Hoorn, 2018, Rao and Powell, 2021). Additionally, local or national museums or community venues should be encouraged to host projects specifically on sustainability to enable children including small children to develop learning about sustainability (Engdahl, 2015). Parents can also assist children to develop confidence by encouraging them to become involved in relevant organisations that promote sustainability or encourage action toward improving climate change. The key is helping children to identify others who are contributing to positive change in the environment at a local, national or international level (Burke, Sanson and Van Hoorn, 2018). Additionally, support children to engage in explicit actions that cultivate climate change awareness. For example, being actively involved in local conservation projects that promote environmentally friendly practices or designing environmental projects that can be shared with their peers (Kurup, Levinson and Li, X, 2021). Finally, it is imperative to amplify children’s voices and involve them in developing and influencing environmental policy for the future (Thompson *et al.*, 2022).

### **Addressing Research Gaps**

With diverse prevailing attitudes towards climate change (Fisher *et al.*, 2018), diverse eco-behaviours being modelled in the home (Rhead *et al.*, 2015), and parents themselves at heightened risk of climate change anxiety (Ekholm and Ollafsson, 2017) it is vital that a consistent evidence-based approach be adopted with how to cope with its psychological effects.



Such an approach should attempt to bridge the generational gap perceived by children, by developing a shared understanding through parent-child communication (Hickman, 2020; Jackson *et al.*, 2022; Spiteri, 2020). Therefore, there is an urgent need for further empirical research into the emotional impact of climate change on children. This call is reinforced by Helldén *et al.* (2021) who highlight the lack of research attention afforded to this health impact and by Charlson *et al.* (2022) who identify a set of ten priority areas for future research in this field. Further, considering the significant expectations placed on this population group as tomorrow's adults, Wu *et al.* (2020: p.e436) advocate that "making investments to improve their mental health and well-being will provide dividends now and, in the future". Preventative care for children is essential (Kotera and Fido, 2022).

## **Conclusion**

Climate change presents a significant threat to the health and well-being of children. Their growing understanding of the human-induced impact on our planet and their position as the future generation who are required to spearhead change has increased reported climate anxiety. Whilst coping strategies and supportive interventions are recommended, further empirical research evidence is needed to determine the next steps to address the extent of the impact of climate anxiety and prepare our children for the future.

## References

- Baker, C., Clayton, S. and Bragg, E. (2021). Educating for resilience: Parent and teacher perceptions of children's emotional needs in response to climate change. *Environmental Education Research*, 27(5): 687-705. <https://doi.org/10.1080/13504622.2020.1828288>
- Berry, H. L., Waite, T. D., Dear, K. B. G., Capon, A. G., and Murray, V. (2018). The case for systems thinking about climate change and mental health. *Nature Climate Change*, 8: 282–290. <https://doi.org/10.1038/s41558-018-0102-4>
- Budziszewska, M. and Jonsson, S.E. (2021). From climate anxiety to climate action: An existential perspective on climate change concerns within psychotherapy. *Journal of Humanistic Psychology*, 0(0). <https://doi.org/10.1177/002216782199324>
- Burke, S., Sanson, A. and Van Hoorn, J. (2018). Raising children to thrive in a climate-changed world. <https://psychology.org.au/getmedia/e8cda6ca-ecfe-42c7-8538-492950bac8ba/raising-children-climate.pdf> [Last accessed: 2023 Jul 6]
- Charlson, Ali, S., Augustinavicius, J., Benmarhnia, T., Birch, S., Clayton, S., Fielding, K. *et al.* (2022). Global priorities for climate change and mental health research. *Environment International*, 158: 106984–106984. <https://doi.org/10.1016/j.envint.2021.106984>
- Clayton, S. (2020). Climate anxiety: Psychological responses to climate change. *Journal of Anxiety Disorders*, 74, Article 102263. <https://doi.org/10.1016/j.janxdis.2020.102263>
- Clayton, S., Manning, C. M., Speiser, M., and Hill, A. N. (2021). *Mental Health and Our Changing Climate: Impacts, Inequities, Responses*. Washington, D.C.: American Psychological Association, and ecoAmerica.
- Dreisbach, E. (2019). Children 'particularly vulnerable' to health threats from climate change. *Infectious Diseases in Children*, 32(12), 19. DOI:10.1016/S0140-6736(19)32596
- Ekholm, S., and Olofsson, A. (2017). Parenthood and worrying about climate change: the limitations of previous approaches. *Risk Analysis*, 37(2): 305-314. <https://doi.org/10.1111/risa.12626>
- Engdahl, I. (2015). Early childhood education for sustainability: The OMEP world project. *International Journal of Early Childhood*, 47(3): 347-366. <https://doi.org/10.1007/s13158-015-0149-6>
- Fisher, S., Fitzgerald, R., and Poortinga, W. (2018). Climate change Social divisions in belief and behaviour. In: Curtice, J., Perry, J., Phillips, D. and Phillips, M. eds. *British Social Attitudes: The 35th Report*, London: The National Centre for Social Research, pp. 1-26.
- Gaziulusoy, A. (2020). The experiences of parents raising children in times of climate change: towards a caring research agenda. *Current Research in Environmental Sustainability*, 2, 100017. <https://doi.org/10.1016/j.crsust.2020.100017>
- Helldén D., Andersson C., Nilsson M, Ebi KL., Friberg P. and Alfvén T. (2021). Climate change and child health: a scoping review and an expanded conceptual framework. *Lancet Planet Health*. 5(3): e164-e175. [https://doi.org/10.1016/S2542-5196\(20\)30274-6](https://doi.org/10.1016/S2542-5196(20)30274-6)

Hickman, C. (2020). We need to (find a way to) talk about ... Eco-anxiety. *Journal of Social Work Practice*, 34(4), 411-424. <https://doi.org/10.1080/02650533.2020.1844166>

Intergovernmental Panel on Climate Change (IPCC). (2022). Climate Change 2022: Impacts, Adaptation, and Vulnerability. Contribution of Working Group II to the Sixth Assessment Report of the Intergovernmental Panel on Climate Change. Cambridge University Press. Cambridge University Press, Cambridge, UK and New York, NY, USA, 3056 pp. <https://www.ipcc.ch/report/ar6/wg2/> [Last accessed: 2023 Jul 6]

IPCC. (2021). Climate Change 2021: The Physical Science Basis. Contribution of Working Group I to the Sixth Assessment Report of the Intergovernmental Panel on Climate Change. Cambridge University Press, Cambridge, United Kingdom and New York, NY, USA. <https://www.ipcc.ch/report/ar6/wg1/> [Last accessed: 2023 Jul 6]

Jackson, J., Rhodes, C., and Kotera, Y. (2022) Parents attitudes towards conversations with their young children about sex A cross-sectional study, *British Journal of Child Health*, 3(4). <https://doi.org/10.12968/chhe.2022.3.4.183>

Jalin, H., Chandès, C., Congard, A., and Boudoukha, A. H. (2022). Appréhender l'éco-anxiété: une approche clinique et phénoménologique. *Psychologie Française*. <https://doi.org/10.1016/j.psfr.2022.03.003>

Kotera, Y. & Fido, D. (2021). Effects of shinrin-yoku retreat on mental health: A pilot study in Fukushima, Japan. *International Journal of Mental Health and Addiction*. DOI: 10.1007/s11469-021-00538-7

Kotera, Y., Ozaki, A., Miyatake, H., Tsunetoshi, C., Nishikawa, Y., Kosaka, M. *et al.* (2022). Qualitative Investigation into the Mental Health of Healthcare Workers in Japan during the COVID-19 Pandemic. *International Journal of Environmental Research and Public Health*, 19(1), 568. <https://doi.org/10.3390/ijerph19010568>

Kotera, Y., and Taylor, E. (2022). Defining the diagnostic criteria of TKS: Unique culture-bound syndrome or sub-categories of existing conditions? *Asian Journal of Psychiatry*. <https://doi.org/10.1016/j.ajp.2022.103383>

Kurup, P.M., Levinson, R. and Li, X. (2021). Informed-decision regarding global warming and climate change among high school students in the United Kingdom. *Canadian Journal of Science, Mathematics and Technology Education*, 21, pp.166-185.

Lawson, D.F., Stevenson, K.T., Peterson, M.N., Carrier, S.J., L. Strnad, R. and Seekamp, E. (2019). Children can foster climate change concern among their parents. *Nature Climate Change*, 9(6), pp.458-462. <https://doi.org/10.1038/s41558-019-0463-3>

Lee, K., Gjersoe, N., O'Neill, S., and Barnett, J. (2020). Youth perceptions of climate change: A narrative synthesis. *Wiley Interdisciplinary Reviews: Climate Change*, 11(3), e641. <https://doi.org/10.1002/wcc.641>

Lewandowsky, S., Gignac, G.E. and Vaughan, S. (2013). The pivotal role of perceived scientific consensus in acceptance of science. *Nature climate change*, 3(4), 399-404. <https://doi.org/10.1038/nclimate1720>

Marks, E., Hickman, C., Pihkala, P., Clayton, S., Lewandowski, E.R., Mayall, E.E. *et al.* (2021). Young people's voices on climate anxiety, government betrayal and moral injury: A global phenomenon. *Government Betrayal and Moral injury: a global phenomenon*. 5(12) e863-e873 [https://doi.org/10.1016/S2542-5196\(21\)00278-3](https://doi.org/10.1016/S2542-5196(21)00278-3)

Majeed, H. and Lee, J. (2017). The Impact of Climate Change on Youth Depression and Mental Health. *The Lancet. Planetary health* 1 (3) 94–95. [https://doi.org/10.1016/S2542-5196\(17\)30045-1](https://doi.org/10.1016/S2542-5196(17)30045-1)

Maran, D. A., and Begotti, T. (2021). Media exposure to climate change, anxiety, and efficacy beliefs in a sample of Italian university students. *International Journal of Environmental Research and Public Health*, 18(17), 9358. <https://doi.org/10.3390/ijerph18179358>

Meier, B.M., Bustreo, F. and Gostin, L.O. (2022). Climate Change, Public Health and Human Rights. *International Journal of Environmental Research and Public Health*. 19, 13744. <https://doi.org/10.3390/>

National Oceanic Atmospheric Administration (NOAA). (2021). Climate change impacts. <https://www.noaa.gov/education/resource-collections/climate/climate-change-impacts> [Last accessed: 2023 Jul 6]

Ojala, M. (2012). How do children cope with global climate change? Coping strategies, engagement, and well-being. *Journal of Environmental Psychology*, 32(3), 225-233. <https://doi.org/10.1016/j.jenvp.2012.02.004>

Ojala, M., and Bengtsson, H. (2019). Young people's coping strategies concerning climate change: Relations to perceived communication with parents and friends and proenvironmental behavior. *Environment and Behavior*, 51(8), 907–935. <https://doi.org/10.1177/0013916518763894>

Palinkas, L.A., (2020). *Global climate change, population displacement, and public health*. Springer.

Prencipe, L., Houweling, T., van Lenthe, F. J., Palermo, T. and Kajula, L. (2021). Exploring multilevel social determinants of depressive symptoms for Tanzanian adolescents: evidence from a cross-sectional study. *Journal of Epidemiology and Community Health*, 75(10), 944–954. <http://dx.doi.org/10.1136/jech-2020-216200>

Rao, M. and Powell, R.A. (2021). The Climate Crisis and the Rise of Eco-Anxiety. *BMJ Opinion*. <https://blogs.bmj.com/bmj/2021/10/06/the-climate-crisis-and-the-rise-of-eco-anxiety/#content>

Rhead, R., Elliot, M., and Upham, P. (2015). Assessing the structure of UK environmental concern and its association with pro-environmental behaviour. *Journal of Environmental Psychology*, 43, 175-183. <https://doi.org/10.1016/j.jenvp.2015.06.002>

Robie, D. and Marbrook, J. (2020). Bearing witness: A Pacific climate crisis documentary and journalism development project. *Asia Pacific Media Educator*, 30(1), pp.77-91. <https://doi.org/10.1177/1326365X20945417>

Rothschild, J., and Haase, E. (2023). Women's mental health and climate change Part II: Socioeconomic stresses of climate change and eco-anxiety for women and their children

*International Journal of Gynecology & Obstetrics*, 160(2), 414-420.  
<https://doi.org/10.1002/ijgo.14514>

Sampaio, F. and Sequeira, C., (2022). Climate anxiety: trigger or threat for mental disorders? *The Lancet Planetary Health*, 6(2), p.e89. [https://doi.org/10.1016/S2542-5196\(22\)00008-0](https://doi.org/10.1016/S2542-5196(22)00008-0)

Spiteri, J. (2020). Too young to know? A multiple case study of child-to-parent intergenerational learning in relation to environmental sustainability. *Journal of Education for Sustainable Development*, 14(1), 61-77. <https://doi.org/10.1177/0973408220934649>

Strife, S. J. (2012). Children's environmental concerns: Expressing ecophobia. *The Journal of Environmental Education*, 43(1), 37-54. <https://doi.org/10.1080/00958964.2011.602131>

Swim, J. K., Aviste, R., Lengieza, M. L., and Fasano, C. J. (2022). OK Boomer: A decade of generational differences in feelings about climate change. *Global Environmental Change*, 73, 102479. <https://doi.org/10.1016/j.gloenvcha.2022.102479>

Thompson, R., Fisher, H. L., Dewa, L. H., Hussain, T., Kabba, Z., and Toledano, M. B. (2022). Adolescents' thoughts and feelings about the local and global environment: a qualitative interview study. *Child and Adolescent Mental Health*, 27(1), 4-13. <https://doi.org/10.1111/camh.12520>

UNICEF. (2021). One billion children at 'extremely high risk' of the impacts of the climate crisis. <https://www.unicef.org.uk/press-releases/onebillion-children-at-extremely-high-risk-of-the-impacts-of-the-climate-crisis-unicef/> [Last accessed: 2023 Jul 6]

van Nieuwenhuizen, A., Hudson, K., Chen, X., and Hwong, A. R. (2021). The effects of climate change on child and adolescent mental health: Clinical considerations. *Current Psychiatry Reports*, 23(12), 1-9. <https://doi.org/10.1007/s11920-021-01296-y>

WHO. (2021). Climate change and health. World Health Organization. <https://www.who.int/news-room/fact-sheets/detail/climate-change-and-health> [Last accessed: 2023 Jul 6]

Wu, J., Snell, G., and Samji, H. (2020). Climate anxiety in young people: a call to action. *The Lancet Planetary Health*, 4(10), e435-e436. [https://doi.org/10.1016/S2542-5196\(20\)30223-0](https://doi.org/10.1016/S2542-5196(20)30223-0)

Xu, R., Yu, P., Abramson, M.J., Johnston, F.H., Samet, J.M., Bell, M.L. *et al.* (2020). Wildfires, global climate change, and human health. *New England Journal of Medicine*, 383(22), pp.2173-2181.