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Inspirational Academic Research Review

**Children's attitudes towards
sustainability and climate changes**



By Maria Kümpel Nørgaard, PhD, Post Doc
Child & Family Marketing Management and Consumer Behaviour
Head of Future Play Design Challenge
Vice President, CoC Playful Minds

Future Play Design Challenge is a non-profit global annual initiative
to inspiring and empowering entrepreneurs within playful learning
to build concepts based on ethical co-creation with children

developed & lead by CoC Playful Minds, and supported by LEGO Ventures



Picture from Unsplash

Purpose

The purpose of this academic research review is to provide participants in Future Play Design Challenge 2022 and other curious within the field, with inspirational insights about the topic sustainability and climate change to help build an academic basis for the development of a concept for the challenge.

The academic research review is based on a triangulation of some of the recent articles published on global research within the topic in various journals.

The topic of the year is “Ethically co-creating the next generation of sustainability and climate play together with children and families”.

The focus circulates around a) children aged about 9 to 12 years, i.e. at the analytical developmental stage, and b) children’s development of attitudes towards sustainability and climate changes, and c) a family learning context.

We encourage to follow up with a supplementary self-study of these and other articles in more details based on specific needs and interests.

Furthermore, this review will be supplemented with a recent empirical research report on children’s unfolding of the specific topic based on their perspectives about sustainability and climate changes, as well as a serie of free online Master Classes.

Please, see our Future Play Design Challenge website for more information or contact us by our email, if interested in the other material.

Enjoy!

Introduction

Children have the rights to influence their own life and world when relevant to them, according to the UN Convention on the Rights of the Child.

The climate is changing, which is a crisis also impacting children's life and world, according to UNICEF. Children may experience an increasing level of the consequences when growing up, both regarding the environment, animal life, and the children's health and wellbeing, due to previous research. Therefore, children should be involved to being able to be prepared now and in the future - to learn how to take an active role as change agents in their everyday life.

In many situations, children already are receiving an increasing level of influence in their own life, e.g. in family decision making, due to previous research; still, their influence tends to be related to the perceived competences of children both in family and in business research & innovation contexts (Nørgaard et al, 2007).

CoC Playful Minds perceive children as creative world citizens. This means we believe children both have the rights and the competences to help influence their life and world now and in the future. It also means that children are capable of not only influencing verbally but also creatively through co-creating designs with adults. However, this requires children will need support from adults to trust this and to further build children's knowledge and skills.

Various social impact factors for children's learning exist, the school is one, which can make the necessary basis - but it cannot stand alone and needs support from other sources in a holistic whole. The family is another social impact factor in children's life, specifically when the children are younger, which have received less attention, but e.g. the intergenerational learning not only from parent to child but also from child to parent and from grandparent to child might have potential as well, due to previous research, as for instance within sustainability and climate change topics. In 2022, Future Play Design Challenge has a focus on the family context and market (B2C).

Playful learning is a great approach for children's development. So, startup companies, entrepreneurs, and others with great ideas for building a business are encouraged to take this opportunity and look into how to develop digital e.g. combined with physical play to build children's awareness, knowledge, and skills within sustainability and climate changes and invite a social family interaction, and maybe peer interaction as well.

Involving children to let them gain influence by co-creating play that can help children to be prepared for the climate change situation when growing up, requires ethical considerations. A main purpose of the Future Play Design Challenge program is to inspire and empower entrepreneurs and businesses within ethical co-creation with children.

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**The current situation of
sustainability & climate change
concerns among and
consequences
for children**

A CSR and ethical perspective on sustainability and climate changes

Background:

- Sustainability and climate change are increasingly perceived as a social justice issue by both academics, policy makers, and the public.
- However, still this has only received limited academic empirical research attention.

Purpose:

- The purpose of this research is to provide a review of previous research, and to highlight critical topics requiring further development.

Method:

- The method used in this article is a desktop search and review of academic literature published about empirical research.

Results:

- The review of empirical research shows that morality and justice can serve as both a bridge but also a barrier for climate change collaboration, which is key to know when implementing actions i.e. in and across an organisation.
- This article highlights two topics for a future focus: 1. Identifying psychological processes that impact climate vulnerability in an organisation, and 2. Enhancing equity in the design and implementation of climate solution actions.
- The article suggests to conceptualise climate justice as a dynamic multidimensional process which includes both social and structural barriers in an organisation.

Reference:

Pearson, A.R.; Tsai, C.G.; and Clayton, S. (2021). Ethics, morality, and the psychology of climate justice. Current Opinions in Psychology 42 (December), pp. 36-42.

Call to action:

Climate change actions in an organisation requires that climate change justice is considered as not a simple but a dynamic and multidimensional process consisting of both social-psychological and structural factors.

The impact of climate changes on children's health and wellbeing

Background:

Purpose:

Method:

Results:

Reference:

Call to action:

- The climate changes impact children's health and wellbeing, so children should learn how to cope constructively.
- The purpose of this empirical research is to explore how children cope with climate changes, and how different coping strategies relate to environmental engagement and well-being.
- The methods used is a survey with a questionnaire, among 12-year-old children (n= 293), in Sweden.
- The research finds that three coping strategies are identified: 1. Problem-focused, 2. Denial of the seriousness of climate change, and 3. Meaning-focused coping.
- Problem-focused coping is positively related to environmental engagement but also to negative affect (emotions).
- Denial is negatively related to environmental engagement, i.e. is not the way to action.
- Meaning-focused coping is positively related to environmental engagement, positive affect, life satisfaction, purpose, and optimism, and can be a buffer for problem-focused children moving away from negative affect.

Ojala, M. (2012). How do children cope with global climate change? Coping strategies, engagement, and well-being. Journal of Environmental Psychology 32 (3), pp. 225-233.

Stimulating positive emotions are key for constructive coping among children. So, positive emotions and constructive coping strategies should be part of pro-environmental play targeted to children.

Children and parents' response to the climate change situation

Background:

Purpose:

Method:

Results:

Reference:

Call to action:

- Along with the climate changes, it is key to understand how children and parents cope with the situation, and how the general media presents this in newspapers to the public, to be able to offer the right support.
- The purpose of this desk research is to look into how lay press narratives view children and parents' response to climate changes.
- The method used is a review of 131 articles published in six top ten American newspapers from 2018 to 2021, about attitudes towards the climate changes by children and parents.
- A qualitative discourse analyses using NVivo software for structuring the data.
- The research finds that, in newspapers:
- Children are typically categorised in four ways: 1. Fierce young activists, 2. Adultified children, 3. Innocent victims, and 4. Ultimate saviours.
- Parents are typically also categorised in four ways: 1. Experiencing eco-anxiety through parenthood, 2. Taming children's eco-anxiety, 3. Criticising child-led activism, and 4. Reimagining climate actions as a source of meaning in the lives of children.

Benoit, L.; Thomas, I.; and Martin, A. (2021). Review: Ecological awareness, anxiety, and actions among youth and their parents - a qualitative study of newspaper narratives. Child and Adolescent Mental Health (Oct). <https://doi.org/10.1111/camh.12514>

Adults' tendency to respond immaturely to children's concerns, is seen as a defence against overwhelming climate change anxiety. Parents need support to conduct more constructive response to their children's concerns, as this will help the children in the end. Involving and supporting parents is highly recommendable.

Age and country differences in climate change concerns among children

Background:

- Climate changes are predicted to impact future generations, and children's voice has never been more important within climate topics, however most research is on adults and young adults, less children.

Purpose:

- The purpose of this desk research is to review previous research on climate change perceptions

Method:

- The method used is a systematic review of previous research about 8-to-19-year-olds' perceptions of climate changes, based on 51 studies from 1993-2018.

Results:

- The findings of this research shows that younger children tend to be more concerned and willing to take action than older adolescents.
- Moreover, children from high-income countries, such as US, UK, and Australia, tend to be less concerned and willing to take actions than other countries.

Reference:

Lee, K.; Gjersøe, N.; O'Neill, S.; and Barnett, J. (2020). Youth perceptions of climate change. WIRE's Climate Change, 11, pp. 1-24.

Call to action:

Though all children have the rights to be involved as change agents in climate topics, the emphasis might need to be differentiated between segments, incl. how play is designed. Children at lower age, from low-income countries seem to be most concerned and willing to take action, though they need help to do it. Bringing children together across age and countries in play may be a way to let them learn from each other's perspectives.

City differences in climate change concerns among children

Background:

Purpose:

Method:

Results:

Reference:

Call to action:

- Living in rural areas may be a driver for pro-environmental behaviour change, as children live close to the nature. However, research is limited on the impact among children.
- The purpose of this empirical research is to investigate the relation between Mexican children's place of living and pro-environmental behaviour (PEB)
- The method used is self-reporting, among 200 children aged 9 to 12 years from Mexican rural areas (i.e. below 1000 inhabitants) and 200 children from a Mexican urban city (more than 150.000 inhabitants).
- The research finds that children from rural areas tend to be more connected to nature and behave more pro-environmentally, than children from urban cities.
- Children's place of living is related to pro-environmental behaviour, mediated by their connection to nature.
- Children's connection to nature is stronger linked to the pro-environmental behaviour for girls than boys.

Duron-Ramos, M.F.; Collado, S.; Garcia-Vázquez, F.I.; and Bello-Echevernia, M. (2020). The role of urban/rural environments on Mexican children's connection to nature and pro-environmental behaviour. Frontiers in Psychology, Brief Research Report, 11 (March), 514, pp. 1-6.

Children from rural city areas close to nature seem to be most concerned and willing to take action, though they need help to do it. Bringing children closer to nature and as well together from different city areas may be a way to let them learn from each other's perspectives in play.



Children's development as sustainability and climate change agents

Why climate change is a tricky human behavioural change because of social norms

Background:

- Climate change challenges are among others due to social norms, as the consequences of the behaviour are less transparent which make people look at what others do.
- The current behaviour, being less sustainable, is the norm right now, thereby is easy to follow and becomes difficult to change into a new habit - as habitual behaviour is challenging to change.

Purpose:

- The purpose of this desk research is to review previous research on behavioural change and the role of social norms, in order to be able to suggest a model of climate behaviour change.

Method:

- The method used is a systematic review of previous research.

Results:

- This research shows that well-implemented social norm strategies can motivate a positive direction in behaviour:
- Appeals to dynamic norms can lead people to change behaviour, by providing information on other people's changes or norm trends.
- Framing normative appeals in terms of an invitation to collaborate with others about a shared goal can increase the motivation to take part in the action.

Reference:

Sparkman, G.; Howe, L.; and Walton, G. (2021). How social norms are often a barrier to addressing climate change but can be part of the solution. Behavioural Public Policy 5 (4), pp. 528-555.

Call to action:

It may be possible to impact children and parents to change behaviours in a pro-environmental way by highlighting social norms as dynamic over time and inviting to a shared journey. So, encouraging children and parents to collaborate will be key to ensure a successful behavioural change in a sustainable direction.

Children's socialisation towards being sustainability change agents

Background:

Purpose:

Method:

Results:

- Children are not just victims of the climate crisis; they are change agents too. Research is starting to shift perspective in how children are seen.
- The purpose of this empirical research is to investigate aspects of children's sustainability socialisation.
- The methods used are interviews including drawings among 30 children.
- The research finds that:
 - Children's socialisation to environmental sustainability, is structured and formal, thus challenging to change.
 - Children's socialisation to self sustainability, is a mix of formal and informal mechanisms with a potential for elaboration and change.
 - Children's socialisation to societal sustainability, is unstructured and individual, thus easier to change.

Reference:

Francis, J.E., and Davis, T. (2014). Exploring children's socialisation to three dimensions of sustainability. Young Consumers 15 (2), pp. 125-137.

Call to action:

Children might often be positively disposed towards sustainability, but they lack knowledge and directions. Marketers should be clear in their products and communication to help guide children. Involving children in this, could make the challenge minor.

Children's development of sustainability attitudes and behaviour

Background:

Purpose:

Method:

Results:

Reference:

Call to action:

- Children's development of sustainability attitudes and behaviour is key to understand in order to help support them.
- The purpose of this desk research is to look into children's role in the climate crisis.
- The method used is a systematic review of previous research.
- The research shows that from a young age, children perceive the environment as a moral concern.
- Early life experience might give the basis for a lifelong pro-environmental behaviour.
- Exposure to nature and to parental pro-environmental behaviours are each predictive of children's commitment to environmental engagement later in life.
- Social influence from parents and as well peers has a strong impact on children's environmental perceptions.

Hahn, E.R. (2021). The developmental roots of environmental stewardship: childhood and the climate change crisis. Current Opinions in Psychology 42 (December), pp. 19-24.

Focusing on and encouraging children to be environmental change agents instead of only victims are key. Early life experiences in nature is key for children, e.g. play could make links between digital actions and physical presence in and interactions with nature. Both parents and peers are key as social influence factors, thus should be considered to be involved in children's play as well as the design of this.

Family plays a key role in children's development of sustainability attitudes and behaviour

Background:

Purpose:

Method:

Results:

- Family and informal learning environments play a key role in children's development of environmentally friendly attitudes and behaviours.
- The purpose of this empirical research is to investigate young children's environmental awareness regarding their ecological footprint and environmental attitudes.
- The method used is a questionnaire among children, using the Ecological Footprint Awareness of Children scale (EKAY-O), among 100 Turkish early childhood children aged 5 to 6 years.

- The research finds that:

- Descriptive) Children's ecological footprint awareness is low.

- (Thematic) Children's attitudes are anthropocentric towards several environmental phenomena (i.e. indicates a human-centred more than nature centred/ecocentric system of values behind the environmental attitudes)

- (Word Clouds) Children's mothers were an essential factor in children's ecological footprint awareness and environmental attitude behaviour.

Reference:

Simsar, A. (2021). Young children's ecological footprint awareness and environmental attitudes in Turkey. Child Indicators Research 14, pp. 1387-1413.

Call to action:

While raising environmentally friendly children, informal learning environments such as within a family context with parents have a key role being an important supplement to the education at school. Parents should be involved when stimulating children within environmental topics. When considering play, it is encouraged to involve parents to play with their children.

Parents are key role models in children's development of sustainability attitudes & behaviour

Background:

Purpose:

Method:

Results:

Reference:

Call to action:

- Family and informal learning environments play a key role in children's development of environmentally friendly attitudes and behaviours.
- The purpose of this empirical research is to investigate the relation between parents' pro-environmental behaviour and their children's pro-environmental behaviour, and how the social interactions between them might impact this.
- The method used is a family online survey by questionnaires targeted to parents and children, among 518 family dyads of one parent and one child across grade 1-6 (1036 participants in total), and across 5 urban cities in China.
- The research finds parents' pro-environmental behaviour is related to children's pro-environmental behaviour.
- The relation between parents' pro-environmental behaviour and their children's pro-environmental behaviour is fully mediated by children's perceptions of the parents' actions and partly mediated by the parent-child communication and parent-child engagement in protecting the environment.
- The relation differs across age and city

Jia, H., and Yu, H. (2021). Action, communication, and engagement: How parents ACE children's pro-environmental behaviours. Journal of Environmental Psychology 74, 101575.

Parents' pro-environmental behaviour plays a key role in impacting children's pro-environmental behaviours. But it requires the parents' behaviour is visible/direct observable for the children through family communication such as discussing environmental topics, showing behaviours in front of the children, and/or engaging in pro-environmental activities together with the children.

So, parents should be encouraged to behave pro-environmentally in a visible way for their children. Developing a play that invites families to interact socially about and show visible pro-environmental behaviour is a key business opportunity. Moreover, inviting families to co-creation workshops about pro-environmental activities is a key step on the way too.

**Future opportunities
to support children in becoming
sustainability and
climate change agents**



Social intergenerational influence & learning from child to parents can be a key factor

Background:

Purpose:

Method:

Results:

Reference:

Call to action:

- Flooding is one key problem caused by climate changes. Children might probably experience more flooding situations, when growing up, as the climate is changing. Still, children are an under-researched group in flood education. This indicates that their potential as change agents is undervalued and should be looked more into.
- The purpose of this empirical research is to investigate children's potential role as change agents through social intergenerational learning within the family and their children's pro-environmental behaviour, and how the social interactions between them might impact this.
- The method used is action-based participatory research among children aged 7 to 9 years.
- A creative and inclusive flood education resource was developed as stimulus for learning.
- The research finds that:
- Young children are able to learn about flooding and preparedness.
- Intergenerational learning from child to parent can occur by letting children transferring messages learned at school to the home.
- However, family relations (empowerment of children) and the parents' disconnection & dissociation from risk, might limit the success of intergenerational learning.

Williams, S., McEwen, L.J., and Quinn, E. (2017). As the climate changes: Intergenerational action-based learning in relation to flood education. The Journal of Environmental Education 48 (3), pp. 154-171.

It is key to educate children in climate changes, consequences, such as flooding, and how to be prepared for this - all to make them ready to help change the situation by their behaviour. Stimulating both children's learning of climate changes and social influence of their parents' attitudes and behaviour is key to success. Children will need support to this, not only in formal learning environments such as at school, but also in the informal at home by playing.

Exercising agency to impact climate change via intergenerational influence is not always simple

Background:

- Food insecurity is a key problem caused by climate changes.
- Adaptation to climate changes is linked to human existence and the planet's wellbeing.
- If learning is not part of this adaptation, it is doubtful that the adaptation will be sustainable.
- In Zimbabwe, an initiative for promoting learning for adaptation is the establishment of the Eco Schools Clubs (ESC), which is a concept of intergenerational learning.

Purpose:

- The purpose of this empirical research is to investigate the context dependency of ESC's affordances for intergenerational climate change learning

Method:

- The method used is an ethnographic study
- In a Zimbabwe context of a community struggling with food insecurity arising from unpredictable rainfall

Results:

- The research finds that as oppositely to studies from the North, children in this study were not able to exercise agency/influence to impact change within their family and its communities.

Reference:

Chineka, R., and, Yasukawa, K. (2020). Intergenerational learning in climate change adaptations: Limitations and affordances. Environmental Education Research 26 (4), pp. 577-593.

Call to action:

Children need support to be able to learn how to exercise agency, in order to help impact their family's climate-related behaviour successfully.

Empowering children's awareness, agency, and action by informal learning is key

Background:

Purpose:

Method:

Results:

Reference:

Call to action:

- As climate changes, education is key for the societal's transformation to sustainability. Formal learning environments at school and informal at home are both key. Often, education is targeted to adolescents or older teens, whereas a focus on younger children is more limited. Children's climate change engagement is increasing, and is framed as a moral obligation - that children, have a right to be informed and engaged in issues that will impact their lives, including prepare them. It is key to empower formal and informal learning environments to stimulate children's engagement.
- The purpose of this empirical research is to investigate the impact of an informal after-school program about climate changes on children's awareness, motivation, and action.
- The methods used is a 15-week after-school program, combined with a mixed-methods study of: a) arts-based participatory action research methods to facilitate children-led activities in the program, and b) surveys and focus groups to measure impacts of the program, among 10-to-12-year-old children from U.S.
- The research finds that:
 - Children have greater knowledge after the program about scientific and social dimensions of climate changes
 - Children are also more inspired and motivated by their growing awareness
 - Children feel empowered by their knowledge and eager to learn more and to take action

Trott, C.D. (2019). *Children's constructive climate change engagement: Empowering awareness, agency, and action. Environmental Education Research* 26 (4), pp. 532-554.

Trott, C.D. (2019). *Reshaping our world: Collaborating with children for community-based climate change action. Action Research* 17 (1), pp. 42-62.

It is key to empower children by stimulating their awareness & knowledge about climate changes, as this will help also stimulate their motivation and actions. Informal learning environments and child-led projects are key to stimulate children and their intergenerational influence in family. Playing at home is a great tool to increase children's awareness and knowledge about climate changes and is thus encouraged. However, stimulating simple tools to empower agency and action are key as a supplement to ensure knowledge will lead to action.

Storytelling is an effective tool to enhance children's sustainability attitudes, and actions

Background:

- The global climate crisis is found to be caused by human behaviour, and it is key that children become aware of this and learn how to behave in more pro-environmental ways.
- Various approaches and tools have previously been investigated.

Purpose:

- The purpose of this empirical research is to investigate the association between theory of mind (ToM), gender, and story comprehension, and young children's pro-environmental orientations.

Method:

- The method used is a survey among 128 pre-schooler children.

Results:

- The research finds that:
- Children's pro-environmental orientation and theory of mind scores did not differ across gender
- Children who articulated an ecocentric (i.e. nature-centred) orientation had higher theory of mind and story comprehension scores, compared to children with an anthropocentric (i.e. human-centred) orientation

Reference:

Altun, D. (2020). Preschoolers' pro-environmental orientations and theory of mind: ecocentrism and anthropocentrism in ecological dilemmas. Early Child Development & Care 190 (11), pp. 1820-1832.

Call to action:

Stories in environmental education are an effective and developmentally appropriate activity for young children.

Gamification may be an effective tool to enhance children's sustainability behaviour

Background:

- Gamification seems to be a promising tool to promote pro-environmental behaviour. However, it is still unclear specifically why due to so far limited validation of effects.

Purpose:

- The purpose of this desk research is to review research evaluating the effect of games and apps in promoting sustainability and make a list of games to be tested.

Method:

- The methods used is a desk research comparison of current games and apps promoting sustainability on market within evaluated in empirical research within the last 5 years.

Results:

- The research indicates that:
- Gamification is a tool that is being used to promote environmental sustainable behaviour.
- This means implementing game design principles in non-game contexts such as board games & apps.
- It has been used for sustainable education, energy reduction, transportation, air quality, waste management, and water conservation.
- Board games can be used to visualise effects of climate changes.
- Apps can be used to collect data related to sustainability e.g. travelling.

Reference:

Douglas, B.D., and Brauer, M. (2021). Gamification to prevent climate change: a review of games and apps for sustainability. Current Opinion in Psychology, 42 (December), pp. 89-94.

Call to action:

Gamification may be a promising tool to stimulate pro-environmental behaviour among children, thus could be looked further into.

N.B. Be aware that the reported effects are mostly tendencies and have not all been tested yet to guide design and development!

Academic References

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For more information:

Website: www.futureplaydesignchallenge.com
Email: contact@futureplaydesignchallenge.org