

## **Regulating worry, promoting hope: How do children, adolescents, and young adults cope with climate change?**

Maria Ojala

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Learning about global problems, such as climate change, is not only a cognitive endeavor, but also involves emotions evoked by the seriousness and complexity of these problems. Few studies, however, have explored how young people cope with emotions related to climate change. Since coping strategies could be as important as the emotions themselves in influencing whether young people will acquire knowledge concerning climate change, as well as ethical sensibility and action competence, it is argued that it is important for teachers to gain insight into how young people cope with this threat. Thus, the aim of this study was to explore how Swedish young people – in late childhood/early adolescence (n=90), mid to late adolescence (n=146), and early adulthood (n=112) – cope with worry and promote hope in relation to climate change. A questionnaire containing both open-ended and Likert-type questions was used. Using thematic analysis, several coping strategies were identified, for instance, de-emphasizing the seriousness of climate change, distancing, hyperactivation, positive reappraisal, trust in different societal actors, problem-focused coping, and existential hope. Furthermore, the results show that the children used less problem-focused coping and more distancing to cope with worry than the two older groups. Concerning sources of hope, the children used less positive reappraisal and instead placed trust in researchers and technological development to a higher degree than the two older groups. Practical implications for education for sustainable development are discussed.

**Key Words:** climate change, coping, worry, hope, education for sustainable development

### **Introduction**

Climate change is a global problem that threatens the survival of the planet. Since young people are the future decision-making citizens and leaders of society, it is important to include them in societal strivings to combat this problem (UNEP, 1992). Hence, it is a task of the educational system at various levels to promote education about climate change and its scientific and societal dimensions. In this process, it is of course important to find out if pupils/students are learning the right facts about the causes, societal impacts, and potential solutions to climate change (see for instance Liarakou, Athanasiadis, & Gavrilakis, 2011) and to promote ethical and critical discussions about this complex issue (Kronlid, 2009). However, more and more researchers have started to acknowledge that learning about global problems is not only a cognitive endeavor but also

an emotional experience (Buissink-Smith, Mann, & Shephard, 2011; Hicks, 1996, Hicks & Bord, 2001; Jensen, & Schnack, 1997; Rogers & Tough, 1996; Taber & Taylor, 2009). Still, compared to the literature about cognitive dimensions of learning about these issues, education research about emotional aspects is scarce (see for instance Hicks, 2010; Ojala, 2011).

Studies show that emotions such as worry, despair, anger, guilt, and helplessness are quite common in relation to global problems (Bentley, Fien, & Neill, 2004; Eckersley, 1999; Hicks, 1996, Hicks & Bord, 2001; Holden, 2007; Norgaard, 2006; Persson, Lundegård, & Wickman, 2011; Rickinson, 2001; Rogers & Tough, 1996; Threadgold, 2012; Tucci, Mitchell, & Goddard, 2007). Yet, how different age groups of young people cope with climate-change-related emotions has not been investigated in detail. Since coping strategies are important mediators and moderators of emotions, these strategies could be as or even more important than the feelings themselves when it comes to influencing whether pupils/students will gain knowledge about climate change as well as acquire action competence. One can, therefore, argue that it is important for teachers to gain insight into how young people cope with this threat (see also Persson et al., 2011; Wals, 2011). The aim of this study was to explore how Swedish young people – in late childhood/early adolescence, mid to late adolescence, and early adulthood – cope with worry and promote hope in relation to climate change.

### **Young People and Education about Climate Change**

In a declaration from the UN conference in Rio 1992 it is stated that all people have the right to learn about sustainable development and that it is especially vital to focus on youth and children (UNEP, 1992). One important part of education for sustainable development concerns learning about global environmental problems such as climate change. In Sweden the curriculums for the compulsory and non-compulsory school systems state that teachers should aid their pupils in developing a democratic and knowledge-based attitude towards ethical questions concerning the relationship between humans and the environment, from both a local and a global perspective (Skolverket, 2011a, 2011b). It is important that young people attain competence in making well-grounded choices and taking personal responsibility regarding these issues. Sustainable development is part of the curriculum through the entire Swedish educational system, up to the college level (SOU, 2004).

At what age, then, should children begin to be taught about global problems such as climate change? Researchers argue that younger children, in pre- and elementary school, should not be over-burdened with information about societal risks that are beyond their own sphere of experience and cognitive ability, but that it is vital that in the intermediate levels of school they begin being taught about the wider world and its problems in order to create opportunities for an active citizenship (Blanchet-Cohen, 2008; Chawla & Flanders Cushing, 2007). Children in late childhood and early adolescence have often acquired a capacity for abstract thinking, meaning they can make use of hypotheses and think beyond the concrete situation (Evenshaug & Hallen, 2001). Many in this age-group also start showing an interest in the wider society and global issues (Holden, 2007)

Regrettably, there is research indicating that learning about global problems can trigger feelings of worry, helplessness and hopelessness (Hicks & Bord, 2001; Rogers & Tough, 1996; Taber & Taylor, 2009). Studies have shown that many young people believe that the world may end during their lifetime due to climate change and other global threats (Albert, Hurrelmann, & Quenzel, 2010; Tucci et al., 2007). Pessimism seems to be particularly strong when it comes to environmental problems (Dean, 2008; Eckersley, 1999; Hicks & Holden 2007; Naval & Repraz, 2008). In addition, research shows that these negative feelings are more common among late adolescents and young adults than among children/early adolescents (Eckersley, 1999; Hicks &

Holden, 1995 in Holden, 2006), indicating that pessimism increases with age perhaps due to the fact that the enormous complexity of the problems becomes apparent. What is important to take notice of is that different ways of handling negative feelings can either hinder or promote factual learning, ethical competence, and the development of action competence (Ojala, 2010). Thus, how young people in different age-groups cope with emotions evoked by climate change is important to investigate.

### **What is Coping?**

According to Lazarus and Folkman (1984), the creators of the well-known transactional model of coping, the coping process consists of two appraisal dimensions: primary appraisal and secondary appraisal. In primary appraisal, the person judges whether a situation constitutes a threat towards something the person values highly, or if it is irrelevant or perhaps even a positive challenge. If the situation is perceived as a threat, or as posing demands that exceed the resources of the person, negative emotions will be felt and the situation could be said to be a stressor. These negative emotions trigger a secondary appraisal process where the person tries to cope with the situation/stressor in different ways.

The literature on coping has often focused on stressors and negative emotions at a micro-level, for instance test anxiety in a school context or interpersonal worry. However, Lazarus and Folkman (1984) also argue that sociological states, such as social alienation and powerlessness, can be classified as stressors with which people need to cope. Furthermore, coping is not only of significance when it comes to threats to one's own well-being, but also concerns situations where one takes notice of threats to the well-being of others. One vital aspect of moral development is to learn how to constructively regulate adverse emotions evoked by empathizing with others' pain (Bengtsson, 2003; Eisenberg, 2000). If these skills are not internalized, self-focused worry or denial of responsibility could be the outcome, instead of helping behavior. In the case of climate change, these "others" can be people living in distant parts of the world, animals, or future generations. Research has shown that other-oriented worries are more common than self-focused worry among young people when it comes to global problems (Ojala, 2007, 2010; Threadgold, 2012).

As indicated above, in traditional research about coping, negative emotions and different ways to regulate these emotions have been in focus. However, in recent years this research has started to go beyond exploring how people merely survive negative states. Proactive coping is a term used in this context and, here, the focus has moved from a stress perspective, where avoiding negative states is the most important thing, to an examination of how people strive to reach goals and meet challenges (Frydenberg, 2002). Proactive coping is future-oriented and concerns how people build resources that promote an active stance towards possible future problems (Greenglass, 2002; Schwarzer & Taubert, 2002).

### **Three Main Ways of Coping**

The transactional model of coping distinguishes between two main aspects of the secondary appraisal process: (1) problem-focused coping, which is about addressing and trying to do something about the problem/stressor causing the negative emotions, and (2) emotion-focused coping, which concerns strategies to regulate or get rid of the negative emotions that are evoked by the problem/stressor (Lazarus & Folkman, 1984). Examples of problem-focused strategies are searching for information about what one can do about the threat, making plans for action, and doing something concrete in order to solve the problem. Examples of emotion-focused strategies are distancing oneself from the stressor, denying the stressor, and seeking emotional support from

persons close to one. Emotion-focused coping can also, paradoxically, include strategies that emphasize the negative emotions felt. Strategies such as rumination, where one passively and repeatedly focuses on negative emotions, (Nolen-Hoeksema, 2000), self-blame where one focuses on negative emotions of guilt and shame (Skinner et al., 2003) and venting where one blows off steam by expressing angry feelings (Bushman, 2002), have been identified as maladaptive ways of dealing with stressful circumstances at a micro-level.

In recent years, problem-focused and emotion-focused strategies have been complemented with a third main way of coping: meaning-focused coping (Park & Folkman, 1997). This form of coping is especially important when the problem cannot be solved at once, or at all, but still demands active involvement, such as when one has to care for a terminally ill partner (Folkman, 2008; Folkman & Moskowitz, 2000). For instance, it can involve finding meaning in a difficult situation, drawing on values and beliefs, and using strategies whereby one acknowledges the threat but re-appraises it in a more positive manner and thereby makes it more manageable. Meaning-focused strategies are more closely related to the activation of positive emotion than to the reduction of negative emotions (Park & Folkman, 1997). Positive emotions, in their turn, can buffer negative emotions, help people to face the difficult situation and build resources, and thereby promote problem-focused efforts (Folkman, 2008). Thus, through its activation of positive emotions, meaning-based coping is closely related to pro-active coping.

In relation to climate change, one positive emotion in particular is interesting to investigate: hope. Since climate change is an existential issue closely related to the future survival of our planet, a sense of hope could be crucial in order to be able to face one's worry without experiencing reduced well-being and increased feelings of helplessness (see Hicks, 2010; Ojala, 2007). Hope is an emotional-cognitive concept, and as such it concerns both positive expectations about the future and a related positive feeling state (McGeer, 2004; Snyder, Rand, & Sigmon, 2001). Research in health psychology shows that people who are highly hopeful are willing to take in information about health threats and act in constructive ways (Snyder et al., 2001). In relation to global environmental problems, hope has been found to buffer worry about these problems from turning into low wellbeing (Ojala, 2005) and to help promote pro-environmental behavior (Ojala, 2008, 2011).

### **Aim of the Study**

The purpose of the present study was to explore how different age-groups of Swedish young people cope psychologically with climate change. The groups in focus were: (1) Children in late childhood, since researchers argue that this is the ideal time to begin educating young people about global problems such as climate change; (2) Youths in late adolescence, since they better understand the complexity of global problems than younger children, which could lead to feelings of helplessness. At the same time their increased cognitive sophistication could also help them to cope with the threat in more diverse ways; (3) Young adults studying at college/university, since many people in this age-group have moved to their own households and therefore have to deal with practical difficulties related to taking full responsibility for living in a climate friendly way. Also, at this educational level, critical thinking and the uncertainty and relativity of knowledge are emphasized, which could influence their view of the possibility to combat climate change in a negative way (see Colby, Beaumont, Ehrlich, & Corngold, 2007, p. 118).

In accordance with the coping theories presented in the introductory section the first aim was to identify, on the one hand, different coping strategies that young people use to deal with worry about climate change and, on the other hand, different ways that young people promote one positive emotion, namely hope, in relation to climate change. Hope was defined and explained to the

young people as an emotion that is activated by the belief and expectation that things will turn out well in the end. In addition, the primary appraisal of young people who indicated they were not worried about climate change was explored in order to understand the processes underlying this stance.

The second aim was to investigate possible quantitative differences in the identified coping strategies between regulation of worry and promotion of hope as well as between age-groups. Coping theories indicate that emotion-focused coping is more common when it comes to regulating worry, while meaning-focused coping is more common when it comes to promoting positive emotions (Park & Folkman, 1997). Age-differences due to, for instance, variations in cognitive maturity and practical circumstances could also be present (Ryan-Wenger, 1992).

## **Method**

### *Procedure and Subjects*

Data were collected through a questionnaire about climate change and coping. A group of children in the intermediate level of school ( $n = 90$ ) and a group of adolescents in senior high-school ( $n = 146$ ) answered the questionnaire at school. Active consent from parents was received for the youngest group. In addition, a group of young adult college/university students ( $n = 112$ ) was approached in the classroom at the university and asked if they wanted to take part in the study. The students then answered the questions at home, returning the questionnaire by mail or by contacting the researcher at the university. All three studies were performed in 2009, before the climate summit in Copenhagen. The climate issue was highly visible in Swedish media this year.

Although great care was taken to include high-school and university students studying different subjects, the three samples are best classified as convenience samples. Response rates were 79% for the children, 82% for the adolescents, and 50% for the young adults. The late childhood sample consisted of 43% boys and 57% girls, with a mean age of 11.7 years ( $s.d. = .48$ ). The adolescent sample comprised 35% boys and 64% girls, with a mean age of 16.4 years ( $s.d. = .59$ ). Finally, the young adulthood sample had a mean age of 22.6 years ( $s.d. = 2.65$ ) and consisted of 32% men and 68% women. All the young people lived in central Sweden in and around a medium-sized municipality.

### *Measures*

The questionnaire contained both Likert-type and open-ended items. The questions were checked both by an intermediate level teacher and a pilot group of children to ensure that most children would understand the questions. All three groups rated how much worry and how much hope they felt about climate change on a 6-point scale, not at all (1), a little (2), fairly little (3), fairly much (4), a lot (5), very much (6). One open-ended question about worry was then answered by those respondents that had indicated feeling worry fairly much, a lot, or very much (children, 29%; adolescents, 62%; early adults, 61%): (1) When you feel the most worried, do you do anything to not worry so much? If yes, describe what you do?

Likewise, open-ended questions about worry were answered by those respondents that had indicated feeling worry fairly little, little, and not at all (children, 70%; adolescents, 38%; early adults, 39%): (1) Describe in your own words why you are not worried about climate change to any great degree. (2) If a friend told you that he or she worries a lot about climate change, what would you say to make him or her not worry so much? Projective strategies to indirectly get at emotion regulation by asking the subjects to give advice to others who feel worried have been successfully used before in at least two studies (Bengtsson, 2003; Thearle & Weinreich-Haste,

1986). Finally, one open-ended question about hope was answered by those respondents that had indicated feeling hope fairly much, a lot, and very much (children, 72%; adolescents, 38%; early adults, 43%): (1) In your own words, describe your main reasons for feeling hope concerning climate change; i.e., why are you hopeful?

### *Data Analysis*

The answers to the open-ended question were coded in a qualitative manner using thematic analysis (Braun & Clarke, 2006). First, all the answers to the open questions were read through carefully. Thereafter, different coping themes and sub-themes were identified. The approach was both deductive and inductive, with the identification of themes being influenced, on the one hand, by previous research about coping and, on the other hand, by an openness to the material, i.e., the specific experiences of coping with climate change expressed by the young people.

In the final part of the coding process, a coding scheme was created. Thereafter – for the three questions separately and for every age-group separately – every statement was read through again and coded into one of the themes. Sometimes a person made complex statements that included several of the coping themes; these were then treated as separate statements and coded into separate themes. Therefore, there are more statements than the total number of people that answered the question. The percentages presented in the tables in the result section are accordingly based on the total number of statements made by each age-group concerning each question (highly worried, not worried, and highly hopeful). The data was double-coded by a second person. The percentage rate of agreement between the two raters varied between 86% and 95%. The items that diverged were discussed by the two coders until agreement was reached.

## **Results**

In this first part of the result section, the coping strategies that were identified when it comes to regulating worry (only respondents who were highly worried) and promoting hope, (only respondents who were highly hopeful), as well as the reasons behind the primary appraisal of not worrying about climate change (only respondents who were not worried) are presented, together with illustrative quotations. In the second part of the result section, differences in these coping themes between worry and hope and between age-groups are presented in a more quantitative manner. Apart from the more active coping strategies, it is important to note that some of the young people mentioned not doing anything to regulate their worry or to evoke hope. In addition, some mentioned that they do not know what they do.

### ***Identified Coping Strategies***

In this section, the coping themes mentioned in relation to regulation of worry, promotion of hope, and the primary appraisal of not being worried are presented under the three headings of problem-focused, emotions-focused, and meaning-focused coping.

#### *Problem-focused coping*

The first main problem-focused coping strategy was: (1) Individual problem-focused strategies (see Tables 1, 2, and 3 for a summary of the different sub-strategies). These concerned things that the young people said they do themselves in order to try to contribute to mitigating climate change. Two subthemes were present in the material. The first was preparatory actions, including

thinking about the problem, searching for information about what one can do, and making plans about what to do.

I usually read about things like how the ice is melting and what measures can be taken, meaning what I can do personally – upper secondary student

I usually think a little more carefully about the good things I can do for the environment, try to see the small actions as important and not only focus on the huge problem, because then it gets overwhelming and you can't deal with it – university student

I read in my climate book, where there are a bunch of suggestions about what kids can do for the environment – intermediate school pupil

The second was direct actions, including doing things in everyday life that you think are environmentally friendly such as bicycling to school instead of asking your parents to drive you, eating less beef, buying environmentally-friendly products, saving energy in the household, and recycling household garbage. This subtheme also consisted of informing other people, such as parents and friends, about the importance of living in an environmentally friendly way.

When I am scared, I try to get mom and dad to take the bus to work and buy the right products – upper secondary student

I ride my bike or walk instead of getting a ride in a car – intermediate school pupil

I sign petitions and things like that. Buy organic and eco-labeled products and ride my bike everywhere. It feels better and I think it might help a little at the end of the day – university student

I look at my own climate actions and encourage others/explain to others what I know we can do – university student

My advice to my friend is to always take the bus instead of going by car or riding a bike. Shut off the computer when you are not using it – upper secondary student

The second main problem-focused strategy was: (2) Collective problem-focused coping. Since climate change is not an individual but a collective problem, as a way to cope with it the young people sometimes thought along the lines that if all of us (including oneself) work together to combat climate change, then things will turn out well in the end.

I think if everybody helps out, we can stop the climate changes – intermediate school pupil

I try to think positively and convince myself that if everybody does something, it will help. Nobody can do everything, but everyone can do a little – university student

I would tell my friend to take it easy, we can all help out so that things get better on our planet – intermediate school pupil

I think it will only work if we all help and don't fight about it and like that. Everyone's ideas work, but we interpret them in different ways – upper secondary student

### *Emotion-focused coping*

Four main emotion-focused coping strategies were identified (see Tables 1, 2, and 3 for a summary of the different sub-strategies): (1) De-emphasizing the seriousness of the climate problem. One of the sub-themes concerned statements that the climate threat is severely exaggerated, does not exist, or perhaps even is something positive for oneself and society. Some of the young people argued that they do not believe that climate change is as large a problem as some claim. It was also mentioned that the problem has been exaggerated in media or that a warmer climate is actually something positive rather than negative, since the Swedish summers will become warmer in the future. Claims that climate change is a natural process, and not human induced, were also coded here, since these claims were always combined with statements that since the problem is natural there is nothing to worry about, or there is actually no problem worth thinking about.

I think it would be great if it gets warmer and warmer – upper secondary student

My advice to my friend is that there's nothing to worry about, I don't think it's going to happen – intermediate school pupil

It feels like a media thing to make us buy more papers. We always have to have something to be afraid of, because then society sticks together and it makes us easier to control. I would ask my friend what happened with all the other threats spread in the media – nothing, that's what. There is a lot of contradicting research, but it doesn't get as much attention in the media – university student

I think things will be okay. I believe climate change is natural – upper secondary student.

Egocentric thinking was another sub-theme that also concerned de-emphasizing the seriousness of the problem, but here, the young did not deny the problem. Instead, they saw the climate threat as not concerning them and therefore as not worth worrying about. Respondents mentioned, for instance, that they consider Sweden a safe country to live in when it comes to climate change, or that they believe the negative consequences of climate change will occur so far in the future that they themselves will no longer be alive. Here, the bottom line is that there is a problem, but it does not concern me.

Then I try to tell myself that there won't be any major disasters during my lifetime – university student

I'd tell my friend that nothing is going to happen because Sweden is a safe country - intermediate school pupil

I don't care that much. If it's going to happen, it will happen after we're dead and then who gives a crap - upper secondary student



I would say there's no danger of any floods as long as we're alive – intermediate school pupil.

Finally, a few of the young people tried to de-emphasize the seriousness of climate change through relativization of the problem. They compared climate change with other, in their minds more important, threats.

My advice to my friend is take it easy, other things should take priority - upper secondary student

I'd say there are other things a lot more dangerous to worry about - university student

My friend is welcome to worry if he or she wants to. But there are more important things to worry about - university student

(2) Distancing is an emotion-focused strategy whereby the young did not try to de-emphasize or deny the seriousness of climate change but instead distanced themselves from the negative emotions evoked by the perceived threat. One sub-theme was distraction, in which the young, when they felt worried, either deliberately tried to think about something else than climate change (cognitive distraction) or tried to distract themselves by doing something else (behavioral distraction) such as talking to a friend, eating ice-cream, or doing something fun in general.

I usually sing because when I do I really calm down, and then I try to think about something else - intermediate school pupil

I think about something fun - intermediate school pupil

I concentrate on physical activity - university student

I'd probably just tell my friend not to worry so much and to think about something else instead - upper secondary student

I try to calm down by listening to music or watching TV - upper secondary student.

Avoidance is another sub-theme in which the young either avoided thinking about the climate threat (cognitive avoidance) or avoided information about climate change by ceasing to read a newspaper or turning off the TV when news about the climate problem was broadcast (behavioral avoidance).

I get worried because there are so many cars. They let out a lot of exhaust fumes and it's getting hotter on earth. So, if there is a lot of traffic, I look in the other direction - intermediate school pupil

I feel worry when I see on TV that the polar bears are going extinct. When that happens, sometimes I leave the room or something - intermediate school pupil

I ignore it all to try and make myself feel secure somehow - university student

I think I try to repress the problem pretty often, otherwise you'll just end up going crazy - university student

My advice to my friend is: Don't think about it! - upper secondary student.

(3) Social support. Here, the young people mentioned that they tried to regulate worry about climate change by talking to other people, such as friends and relatives. Or they just sought the company of others in order to feel more secure.

Sometimes I lay in bed at night and worry. Then I go down and see my mom and dad - intermediate school pupil

I don't feel I can do anything except talk about it to get my feelings out - university student

My advice is that I think he or she should talk to somebody who knows a lot about the climate. That might make my friend relax a little - upper secondary student

(4) Hyperactivation. Unlike the other emotion-focused strategies, hyperactivation is not about trying to dampen worry about climate change, but instead comprises strategies that can be seen as increasing negative emotions through an elevated awareness and a passive focus on the threat (see Bengtsson, 2003). These strategies were not common, but were present in the two older age-groups' responses to worry. For instance, some seemed to focus on negative emotions of worry and guilt in a ruminative way, claiming that everything will get worse and that we will only have ourselves to blame when the planet collapses. Others were venting their anger over climate change. In this category statements were coded that indicated helplessness, thoughts that we cannot do anything about climate change. A few of the young people also expressed a kind of fatalism, mentioning that they handled worry by having accepted that the world will end due to climate change.

I think we pretty much deserve it because we ignore the environment for the sake of economic growth - university student

I feel powerless; there's nothing I can do. Even though I recycle a lot, it feels like the coal-fired power plants just spew out carbon dioxide and then everything seems pointless - university student

Try to accept the truth and become more bitter about humanity - university student

I would say you can't make any difference anyway, you're going to die no matter what - upper secondary student

You think about how lazy you are and how much you take for granted - upper secondary student

#### *Meaning-focused coping*

Three main meaning-focused coping strategies were identified (see Tables 1, 2, and 3 for a summary of the different sub-strategies): (1) Positive reappraisal is about acknowledging the prob-

lem, but trying to reframe the situation so as to also see it in a positive light. Most often it took the form of putting things into a historical perspective. Here the young people emphasized that even though climate change is a serious problem, the awareness of climate change in society seems to have increased in recent years.

Because more and more people are starting to understand more about the climate and how it is hurting the animals - intermediate school pupil

Because people are becoming more and more aware and concern for the environment is starting to become part of everyday life in the things we buy or do - upper secondary student

It seems like the problem has received more attention in recent years and they are coming up with new ways to improve the climate problem - university student

Another sub-theme involved turning worst case scenarios into something positive, with the respondents arguing that when the negative consequences of climate change become more observable in western countries people will finally put effort into solving the problem.

Despite all, I think that people will finally, before it's too late, do the sensible thing. I think the financial crisis is going to make the industrialized countries think about life - university student

I hope the changes that need to be made happen. That might not happen until the situation is absolutely urgent, but still. Change is going to happen because it is necessary - university student

(2) The second meaning-focused strategy was named positive thinking/existential hope. Here, the young people tried to think in an optimistic and hopeful way about the problem. They did perceive a threat, but they also focused on positive aspects and tried to emphasize that the problem will probably be solved in the future. Some young people wrote that they more or less forced themselves to be hopeful and that this was very important because without hope there is no reason to do anything or to plan for the future. Others stated that they just try to think positively, with or without mentioning anything concrete to be hopeful about.

I would tell my friend that things will be better in the future for sure - upper secondary student

I don't believe in living my life as a pessimist - university student

I feel hope because I feel hope - intermediate school pupil

No hope, no reason to live – intermediate school pupil

You have to feel hope to make things any better. If no one felt hope, then you might as well give up. And then everything will come crashing down. - upper secondary student

(3) Trust. The third meaning-based strategy was trust and confidence in different sources outside oneself. The most common subtheme was trust in science and technological development.

Here, the young people argued that scientists will solve the problem by coming up with intelligent solutions and new technical innovations.

Since there is so much research in the field, I believe a solution shouldn't be all that far away – upper secondary student

I think somebody is going to invent something good for nature and all the people and animals - intermediate school pupil

Because I believe people are going to discover new techniques to counteract the climate changes - university student

Because I think people are going to figure out new stuff, like cars that do not let out exhaust fumes - intermediate school pupil

Because scientists and other people are working really hard to find a solution - intermediate school pupil

The adolescents and young adults also mentioned trust in politicians/politics and international agreements as a source of hope. The new US president (Barack Obama) was seen as likely to take the climate issue more seriously than the former president (George W. Bush). Some of the respondents also mentioned that politicians are now collaborating at a more global level, which was seen as something hopeful.

My advice is that you'll have to trust the politicians – upper secondary student

Obama puts more priority on the environment than Bush did - upper secondary student

The issue is on the agenda of so many international bodies. It would be amazing if we were not able (if not totally solve it, at least almost) to manage this - university student

Hopefully there will be some changes to environmental and climate policy - university student

Trust in the business sector was not a common theme, but was nevertheless present in some of the older respondents' answers. They mentioned that it is hopeful that even the business sector has started to take climate change seriously and now tries to make money by selling climate-friendly products.

You can see that businesses of all kinds are thinking a bit more about acting in environmentally friendly ways – university student

...and businesses are working to become more climate smart and reduce their impact - university student

A more common theme, mentioned by all three groups, was trust in environmentally active people and environmental organizations. Here, the young people would think about all the people who are already active concerning climate change, either privately or in environmental organizations.

It feels like the environmental movement is having more impact on those with power. They dare not resist anymore. - university student

Because there are already people who are dealing with it - upper secondary student

Because a lot of people are working, planting new trees, dealing with the waste and exhaust fumes from cars - intermediate school pupil

Some of the young had a basic trust in humanity and put forward the argument that humans are rational beings and will therefore eventually take the climate issue seriously.

People are always going to want to solve the problems around them. So, I have trust in people's common sense. - university student

I suppose I still believe in and hope that people are good and well-meaning. - university student

I believe we people have the power to fix our mistakes - upper secondary student

Our generation is goal-conscious and sensible - upper secondary student  
Because I believe we are smart enough to stop it (the climate threat) - intermediate school pupil

A final, very uncommon, sub-theme was a form of religious coping where the young put their faith in God.

I believe in the resurrection, I'm a Jehovah's Witness – intermediate school pupil

### ***Regulating Worry, Promoting Hope – Comparing the Results***

In this section, more quantitative comparisons are presented. For instance age-differences in the use of the different coping strategies are elaborated on.

#### *Coping strategies in relation to regulation of worry and promotion of hope*

As can be seen in Tables 1, and 3, in accordance with the coping theories presented in the introduction, emotion-focused coping was more common when it comes to regulating worry (39.2%) than promoting hope (6.1%), while meaning-focused coping was more common when it comes to promoting hope (78.2%) than regulating worry (13.2%). In addition, problem-focused coping was used more in relation to the regulation of worry (31.1%) compared to how often it was used to promote hope (13.1%).

Table 1. Strategies for coping with worry among the three age-groups of young people (young people worried about climate change)

	The chil- dren	The teenagers	The young adults	All three age- groups
<b>Problem-focused coping</b>	<b>15.6%</b>	<b>33.0%</b>	<b>44.8%</b>	<b>31.1%</b>
Individual	9.4%	32.0%	42.9%	28.1%
Collective	6.2%	1.0%	1.9%	3.0%
<b>Emotion-focused coping</b>	<b>43.7%</b>	<b>35.0%</b>	<b>39.0%</b>	<b>39.2%</b>
De-emphasizing the threat	0.0%	5.0%	4.8%	3.3%
Distancing	40.6%	20.0%	15.2%	25.3%
Social support	3.1%	5.0%	7.6%	5.2%
Hyperactivation	0.0%	5.0%	11.4%	5.5%
<b>Meaning-focused coping</b>	<b>18.8%</b>	<b>12.0%</b>	<b>8.7%</b>	<b>13.2%</b>
Positive reappraisal	0.0%	1.0%	1.0%	0.7%
Pos thinking/existential hope	6.3%	7.0%	4.8%	6.0%
Trust – all sources	12.5%	4.0%	2.9%	6.5%
Trust – science	6.3%	1.0%	0.0%	2.4%
Trust – politicians	0.0%	1.0%	0.0%	0.3%
Trust – business	0.0%	0.0%	0.0%	0.0%
Trust – active pers	3.1%	0.0%	2.9%	2.0%
Trust – humanity	0.0%	2.0%	0.0%	0.7%
Trust – God	3.1%	0.0%	0.0%	1.0%
<b>I don't do anything special</b>	<b>12.5%</b>	<b>17.0%</b>	<b>7.6%</b>	<b>12.4%</b>
<b>I don't know</b>	<b>9.4%</b>	<b>3.0%</b>	<b>0.0%</b>	<b>4.1%</b>
<b>Not able to code</b>	<b>0.0%</b>	<b>0.0%</b>	<b>0.0%</b>	<b>0.0%</b>
Total	100%	100%	100%	100%
Total numbers of strategies mentioned	32	100	105	237
Inter-coder agreement (%)	91%	95%	92%	93%

*Note.* The percentages presented in the table are based on the total number of strategies mentioned by each age-group concerning, in this case, how they regulate worry (this question was only answered by those who were highly worried).

If one look more closely at the more specific emotion-focused strategies mentioned, de-emphasizing the seriousness of climate change was hardly used at all to regulate worry by the young people who actually felt worried (see Table 1). Instead, the most common emotion-focused coping strategy among all three age groups for regulating worry was to use different distancing strategies. De-emphasizing the seriousness of the problem was, on the other hand, a quite common strategy, actually the most common, among those who were not worried about climate change and who described why they did not worry, and who gave advice to a friend on

how to regulate a high degree of climate worry (see Table 2). Worth mentioning is that the only emotion-focused strategy used to activate hope was de-emphasizing the seriousness of climate change, with its denial-like strategies (see Table 3). These strategies were not common, but were still present in all three groups.

Table 2. Advice to a worried friend on how to cope with worry among the three age-groups of young people (young people not worried about climate change)

	The children	The teenagers	The young adults	All three age-groups
<b>Problem-focused coping</b>	<b>13.7%</b>	<b>24.7%</b>	<b>31.4%</b>	<b>23.3%</b>
Individual	6.1%	22.0%	31.4%	19.8%
Collective	7.6%	2.7%	0.0%	3.4%
<b>Emotion-focused coping</b>	<b>65.1%</b>	<b>53.4%</b>	<b>51.9%</b>	<b>56.8%</b>
De-emphasizing the threat	42.4%	30.1%	31.5%	34.7%
Distancing	19.7%	13.7%	11.1%	14.8%
Social support	1.5%	1.4%	1.9%	1.6%
Hyperactivation	1.5%	8.2%	7.4%	5.7%
<b>Meaning-focused coping</b>	<b>19.6%</b>	<b>13.7%</b>	<b>9.4%</b>	<b>14.2%</b>
Positive reappraisal	3.0%	4.1%	1.9%	3.0%
Pos thinking/existential hope	10.6%	8.2%	3.7%	7.5%
Trust – all sources	6.0%	1.4%	3.8%	3.7%
Trust – science	4.5%	0.0%	0.0%	1.5%
Trust – politicians	0.0%	1.4%	1.9%	1.1%
Trust – business	0.0%	0.0%	0.0%	0.0%
Trust – active pers	1.5%	0.0%	0.0%	0.5%
Trust – humanity	0.0%	0.0%	0.0%	0.0%
Trust – God	0.0%	0.0%	1.9%	0.6%
<b>Don't do anything special</b>	<b>0.0%</b>	<b>1.4%</b>	<b>0.0%</b>	<b>0.5%</b>
<b>I don't know</b>	<b>1.5%</b>	<b>6.8%</b>	<b>5.6%</b>	<b>4.6%</b>
<b>Not able to code</b>	<b>0.0%</b>	<b>0.0%</b>	<b>1.9%</b>	<b>0.6%</b>
Total	100%	100%	100%	100%
Total numbers of strategies mentioned	66	73	54	193
Inter-coder agreement (%)	92%	92%	94%	<b>93%</b>

*Note.* The percentages presented in the table are based on the total number of strategies mentioned by each age-group concerning, in this case, advice to a worried friend (this question was only answered by those who were not worried).

Concerning specific problem-focused strategies, it is interesting to note that individual problem-focused strategies, such as doing something concrete or searching for information about how one can help, were more common than collective problem-focused strategies in all age-groups when it comes to regulating one's own worry about climate change, and also when it comes to giving advice to a friend<sup>3</sup> (see Tables 1 and 2). However, when it comes to promoting hope, the opposite was true; i.e., collective strategies such as thinking that if we all help out things will turn out well in the end, were used more often (see Table 3).

*Age-differences in Coping with Climate Change*

Some notable age-differences were present in the material. The children used less problem-focused coping and more distancing strategies to cope with worry than did the two older groups (see Table 1). Concerning sources of hope, the children used less positive reappraisal and instead used positive thinking/existential hope more, and had trust in researchers and technological development to a higher degree, than the two older groups (see Table 3).

Concerning hyperactivation with regard to regulating worry, and to a certain degree when giving advice to a worried friend, it is interesting to notice that these strategies of emphasizing negative emotions were hardly used at all by the children, but were more common among the two older age-groups (see Tables 1 and 2). However, compared to the other coping-strategies they were not used often.

Table 3. Strategies for promoting hope among the three age-groups of young people (young people high on hope concerning climate change)

	<b>The children</b>	<b>The teenagers</b>	<b>The young adults</b>	<b>All three age-groups</b>
<b>Problem-focused coping</b>	<b>12.9%</b>	<b>15.9%</b>	<b>10.5%</b>	<b>13.1%</b>
Individual	3.2%	2.9%	4.5%	3.5%
Collective	9.7%	13.0%	6.0%	9.6%
<b>Emotion-focused coping</b>	<b>8.1%</b>	<b>5.8%</b>	<b>4.5%</b>	<b>6.1%</b>
De-emphasizing the threat	8.1%	5.8%	4.5%	6.1%
Distancing	0.0%	0.0%	0.0%	0.0%
Social support	0.0%	0.0%	0.0%	0.0%
Hyperactivation	0.0%	0.0%	0.0%	0.0%
<b>Meaning-focused coping</b>	<b>74.1%</b>	<b>75.3%</b>	<b>85.1%</b>	<b>78.2%</b>
Positive reappraisal	8.1%	31.9%	29.0%	23.0%
Pos thinking/existential hope	25.8%	14.5%	7.8%	16.0%
Trust – all sources	40.2%	28.9%	48.3%	39.1%
Trust – science	27.4%	13.0%	12.1%	17.5%
Trust – politicians	3.2%	8.7%	16.6%	9.5%
Trust – business	1.6%	0.0%	3.0%	1.5%
Trust – active pers	4.8%	2.9%	4.5%	4.1%
Trust – humanity	3.2%	4.3%	9.1%	5.5%
Trust – God	0.0%	0.0%	3.0%	1.0%
<b>I don't do anything special</b>	<b>0.0%</b>	<b>0.0%</b>	<b>0.0%</b>	<b>0.0%</b>
<b>I don't know</b>	<b>1.6%</b>	<b>0.0%</b>	<b>0.0%</b>	<b>0.5%</b>
<b>Not able to code</b>	<b>3.2%</b>	<b>2.9%</b>	<b>0.0%</b>	<b>2.0%</b>
Total	100%	100%	100%	100%
Total numbers of strategies mentioned	62	69	66	197
Inter-coder agreement (%)	86%	87%	92%	88%

*Note.* The percentages presented in the table are based on the total number of strategies mentioned by each age-group concerning, in this case, how to promote hope, (this question was only answered by those who were hopeful).



Finally, when it comes to promoting hope, trust in politicians and international agreements was more common among the two older age-groups than among the children, with the university students being particularly inclined to use this strategy (see Table 3). Nevertheless, it must be noted that trusting politicians was not particularly common among the adolescents and young adults either.

## **Discussion**

### *Relating the Results to Earlier Research*

The present study shows that young people use a plethora of different strategies to cope with climate change ranging from de-emphasizing the seriousness of climate change to performing activities in everyday life to try to contribute to the solution of the problem. While some age-differences were evident in the choice of coping strategies, it is interesting to note the similarities between the age-groups, i.e., that almost all of the strategies were used by all the age-groups, though sometimes to different degrees. Worry about climate change was most commonly regulated either by various distancing strategies or by problem-focused strategies, although the children to a higher degree used distancing as a way to cope with this threat. This is hardly surprising since children do not have as much control as adults over their behaviors in everyday life, because they are, for instance, restrained by and dependent on their parents (Ryan-Wenger, 1992; see also Taber & Taylor, 2009).

Often, distancing strategies are seen as less productive than problem-focused strategies or meaning-focused strategies when it comes to coping with different stressors (Stroebe et al., 2007). However, this does not have to be the case. For instance, a study has shown that instead of impairing retention of educational material, disengaging from emotions actually made the children remember the information better (Rice, Levine, & Pizarro, 2007). Still, it is easy to imagine distancing strategies as precursors to the disengaged style that many adults show when it comes to climate change, a style that can hinder engagement and action competence concerning this problem (see for instance Olausson, 2011; Noorgard, 2006).

In all three age-groups, hope was primarily evoked by different meaning-focused strategies such as positive re-appraisal and by having trust in different societal actors. These strategies have been found to be quite constructive since they seem to be related to felt environmental efficacy, environmental engagement, and subjective well-being among young people (Ojala, 2010, 2011, 2012). In the present study, the children did not use as much positive re-appraisal as the other two groups and instead used positive thinking/existential hope to a greater extent, and had more trust in science and technological development. This is, again, not surprising since some children in this age-group may not yet possess the cognitive maturity to make use of positive re-appraisal to any greater extent (Cunningham, Brandon, & Frydenberg, 2002). Studies have also found that positive attitudes towards science seem to be stronger in late childhood than in late adolescence (Osborne, Simon & Collins, 2003).

What is important to take notice of is that hope, while not common, was sometimes promoted by de-emphasizing the seriousness of climate change, by denying that climate change is a problem, or through egocentric thinking where it is seen as a problem that does not concern oneself. De-emphasizing the seriousness of climate change was also present among young people who were not worried about climate change and who were giving advice to a worried friend. Hope based on these strategies, as opposed to hope based on meaning-focused strategies, has been found to be negatively related to environmental engagement (Ojala, 2011). Again it is tempting to draw parallels to denial-like strategies that are present in different adult samples (Feinberg & Willer, 2011; McCright & Dunlap, 2011). Concerning the two older age-groups, this

can, perhaps, be a correct observation, however, when it comes to the children one has to be aware that these thoughts are not particularly well-developed. Rather than being about, for instance, distrust of science, their thinking takes the form of simple statements such as “It will not happen” or egocentric thinking, strategies that perhaps are caused by developmental factors that will change with age.

It is also interesting to note that hyperactivation, including rumination and a passive focus on negative emotions, was not present in the children’s statements, but that it, while not common, was present among the two older age-groups. In addition, the two older age-groups felt hope concerning climate change to a lesser degree than the children (see the method section under the sub-heading measures). This is in accordance with studies indicating that helplessness and hopelessness concerning global problems increase with age among young people (Eckersley, 1999; Hicks, 1996; Hicks & Holden, 1995 in Holden, 2006).

### **Practical Implications**

What, then, are the practical implications of this study? First of all, teachers and educators, whether they prefer a fact-based, normative, or pluralistic approach to education for sustainable development (see Sandell, Öhman, & Östman, 2005), could benefit greatly from taking into account both the emotions felt, and the different emotion-regulating strategies used by young people in relation to global problems such as climate change. This is, perhaps, especially important when employing a pluralistic approach, since this demands the ability to bear discomfort and negative emotions associated with uncertainty and complexity (for related arguments see Ojala & Lidskog, 2011). In this process, it could be helpful to try to ascertain the “functions” of the coping strategies used. Below, the possible functions of distancing, de-emphasizing the seriousness of the threat (ego-centric thinking/denial), and of hyperactivation are discussed.

If the reason why children use distancing more than the older age-groups is because it is the most convenient way to regulate negative emotions when one is less capable of using problem-focused coping, then teachers can help the children by providing concrete examples of how they can behave pro-environmentally despite their dependence on their parents. That the examples are concrete is important, since at least one study has found that problem-focused strategies aimed more at searching for information and planning than at concrete action are related to worry about climate change among children, and more importantly, to negative emotions in general (Ojala, 2012; see also Taber & Taylor, 2009). Teachers could also promote meaning-focused strategies (positive re-appraisal and trust), since these have been found to help prevent negative affect from leading to low well-being, and to be related to self-efficacy and pro-environmental engagement (Ojala, 2010, 2012).

If ego-centric thinking is a question of a lack of advanced perspective taking skills, perspective taking training could be beneficial. De-emphasizing the threat could also mean that the young people, especially the older ones, have taken what in their view is a rational decision not to consider climate change a problem. In this regard, many would argue that this opinion is based on a lack of knowledge and that teachers should counter it with more scientific facts. However, although many of the young people who use these strategies claim that they are not worried, several studies performed on adults show that de-emphasizing the seriousness of climate change is not primarily a question of a lack of knowledge, but is instead related to specific worldviews (conservatism, a belief in a just world) that some people embrace; worldviews which are threatened by information about the dire consequences of climate change (Feinberg & Willer, 2011; McCright & Dunlap, 2011). Thus, sometimes the view that climate change is not a major problem seems to be a coping strategy used to defend tightly held worldviews. If this is the case, no

matter how many scientific facts one presents, they still will not be taken seriously. The same goes for perspective taking training; if egocentric thinking is a way of handling negative emotions that are too difficult to face, these exercises could actually lead to further de-emphasizing or distancing on the part of the young people. Again, it would be wise to also focus on meaning-focused strategies and constructive optimism that can buffer excessive negative emotions and thereby potentially promote learning (see Ojala, 2010, 2011, 2012). Recent research has also shown that focusing on co-benefits of climate change actions, for instance, scientific and economic progress, can motivate climate change deniers to behave pro-environmentally (Bain, Hornsey, Bongiorno, & Jeffries, 2012).

Additionally, earlier research has found that de-emphasizing the climate threat correlates negatively with environmental efficacy (Ojala, 2010, 2012). One can speculate that children who feel unable to influence societal issues in general may be more prone to developing these coping strategies. If this is the case, various ways of trying to improve action competence would appear to be important (Jensen & Schnack, 1997; Persson et al., 2011).

What, then, is the function of hyperactivation? It is easy to think that these strategies are about being too emotionally involved concerning climate change and that a healthy degree of distancing could help these people in the learning process (see for instance Rice et al., 2007). However, newer findings show that hyperactivation-like ways of coping, such as rumination, actually are avoidant strategies (Stroebe et al., 2007). The function of these strategies is to avoid problem-focused efforts by passively focusing on negative emotions and helplessness. When it comes to climate change, these strategies could be ways to avoid accepting the responsibility to live in a sustainable way that comes with young adulthood. If there is no hope, then you do not have to do anything. Being hopeful is much more demanding because then you have no excuse for not helping. Thus, instead of promoting distancing one should help the young who use hyperactivation to a high degree to confront and handle negative emotions, such as guilt, related to taking on responsibility.

It is also vital to find out how young people are handling the complexity and uncertainty that are related to climate change and that become more obvious with age. Research has found that among young adults, ambivalence and uncertainty about environmental engagement in everyday life are often handled with hyperactivation-like strategies that impede engagement, for instance “black-and-white” thinking whereby one argues that if not *everyone* is behaving pro-environmentally then it is *totally* meaningless to do anything oneself, or that if one is not able to behave pro-environmentally *all the time* it is *totally* meaningless to do anything (Ojala, 2008; Ojala & Rikner, 2010). It is, however, important to realize that this is not the only way to cope with ambivalence; more constructive strategies were also employed by some young people. Some argued, for instance, that one could at least be a role-model by behaving in a pro-environmental fashion, or that no one can be perfect but this is no reason not to try to do one’s best (Ojala & Rikner, 2010). Teachers could put forward more constructive strategies and compare them with hyperactivation-like strategies, and discuss these critically in the classroom. In addition, the meaning-focused strategy of positive re-appraisal/reframing seems to be able to counteract the negative effects on engagement of perfectionistic concerns and self-blame (Stoeber & Janssen, 2011).

Throughout this discussion, the importance of promoting meaning-focused strategies such as positive reappraisal has been emphasized. Here, teachers can be inspired by psychological research about skills that promote flexible thinking, well-being, and optimism at a micro-level among young people (see for instance Cunningham et al., 2002; Gillham & Reivich, 2004). The first step is to talk about emotions in relation to climate change and identify different ways that young people cope with these emotions. The second is to evaluate one’s own self-talk; is it the

only way to think about these issues? The third step is to generate alternative interpretations and challenge denial-like and catastrophic thinking. In this regard, it is also vital to try to bridge the gap that research has identified among young people between one's own future, which is often viewed in an optimistic light, and the future on a global scale, which is often viewed pessimistically (see for instance Threadgold, 2012).

Finally, some comments about limitations of this study and suggestions for future research are in order. One limitation is that the data are not at a level that allows for performing advanced statistical analyses on the material. In order to investigate correlations with other variables and to find possible statistically significant differences between groups, the coping strategies need to be measured quantitatively in future studies. In addition, even though this study focuses on individual coping strategies, it is obvious that the regulation of emotion in relation to climate change does not take place in isolation, but is also a social process involving, for instance, how people talk and interact with others about these issues (see Folkman, 2009). Thus, coping with climate change in a social context should be investigated in future studies.

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### Notes:

<sup>1</sup> Since the focus of this study was on young adults, only respondents 30 years or younger were included. The answers of 23 persons over the age of 30 were excluded from the study.

<sup>2</sup> The open-ended questions were chosen in order to elicit as broad responses as possible concerning how the young people regulated worry and promoted hope in relation to climate change. It was important that the questions were not too long, that they were suitable for all age-groups, and that they could be understood by the children.

<sup>3</sup> The exception being the children

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### **Author**

Maria Ojala has a PhD in psychology and is an Assistant Professor at the Department of Education, Uppsala University, Sweden. Her main research interests lie in the intersection between environmental psychology and education for sustainable development with a special focus on emotions and coping. Her latest publications are in *Journal of Environmental Psychology*, *Environmental Education Research*, and *Environmental Values*. **Correspondence:** Maria Ojala, Department of Education, Uppsala University, SE-750 02 Uppsala, Sweden. Phone: +46 18 471 24 22; E-mail: [maria.ojala@edu.uu.se](mailto:maria.ojala@edu.uu.se)



## **Endişleri düzenleme, umutları arttırma: Çocuklar, ergenler, gençler ve erişkinler iklim değişikliği ile nasıl başa çıkıyor?**

İklim değişikliği gibi evrensel sorunlar hakkında bilgi edinmek sadece bilişsel bir çaba değil, aynı zamanda bu sorunların ciddiyeti ve karmaşıklığından dolayı ortaya çıkan duygular gerektirir. Fakat çok az sayıda çalışma genç insanların iklim değişikliği ile ilgili duygularla nasıl baş ettiklerini araştırmıştır. Baş etme stratejileri, gençlerin iklim değişikliğiyle ilgili bilgi edinmelerini, etik duyarlılıklarını ve eylem yetkinliklerini etkileyen duygular kadar önemli olabileceğinden, öğretmenlerin gençlerin bu tehditle nasıl baş ettikleri hakkında fikir sahibi olmaları önemlidir. Bu yüzden, bu çalışmanın amacı geç çocukluk/erken ergenlik (n=90), geç ve orta ergenlik (n=146) ve erken yetişkinlik (n=112) dönemlerindeki İsveçli gençlerin iklim değişikliklerinden kaynaklı üzüntüyle nasıl baş ettikleri ve nasıl umutlandıklarını araştırmaktır. Bu çalışmada hem açık uçlu hem de Likert-tipi sorular içeren bir anket kullanılmıştır. Tematik analiz yöntemi kullanılarak, iklim değişikliğine verilen önemi azaltma, uzaklaşma, hiperaktivasyon, pozitif değerlendirme, farklı toplumsal aktörlere olan güven, problem odaklı başa çıkma ve varoluşçu umut gibi çeşitli başa çıkma stratejileri tespit edilmiştir. Buna ek olarak, çalışmanın sonuçları, çocukların üzüntüyle baş etmede diğer iki daha yaşlı gruptan daha az problem odaklı başa çıkma stratejilerini ve daha çok uzaklaşma stratejilerini kullandıklarını göstermiştir. Umudun kaynağı ile ilgili olarak, çocukların diğer iki daha yaşlı gruptan daha az olumlu değerlendirme yaptığı ve araştırmacılara ve teknik gelişmelere daha çok güvendikleri anlaşılmıştır. Çalışmada ayrıca, sürdürülebilir kalkınma için eğitim ile ilgili olarak pratik sonuçlar tartışılmıştır.

**Anahtar Kelimeler:** iklim değişikliği, baş etme, üzüntü, umut, sürdürülebilir kalkınma için eğitim