Hope in the face of climate change:

Associations with environmental engagement and student perceptions of teachers' emotion

communication style and future orientation

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Abstract

Is hope concerning climate change related to environmental engagement, or is it rather associated with unrealistic optimism and inactivity? This study on Swedish high-school students identified two kinds of hope: constructive hope and hope based on denial. Constructive hope was positively associated with engagement and a perception that teachers respect students' negative emotions concerning societal issues and have a future-oriented, positive, and solution-oriented communication style. Students who felt hope based on denial instead were less inclined to behave pro-environmentally and perceived their teachers as not taking their emotions seriously and as communicating in a pessimistic way. Boys perceived their teachers as less accepting of negative emotions, which explained why they felt more hope based on denial than girls. Practical implications of these findings are discussed.

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Today there is a widespread consensus that climate change is one of the most serious

threats facing humanity on a global scale (Cook et al., 2013; IPCC, 2013; Oreskes, 2004). To

be able to combat this problem all societal actors need to get involved. In order to reach

young people, environmental education (EE) and education for sustainable development

(ESD) in schools are vital. Traditionally, the focus has been on educating students about the

causes, societal impacts and possible solutions to global problems and to promote critical

discussions around ethical aspects, value conflicts and uncertainties (see Öhman, 2006).

However, in recent years researchers have started to acknowledge that education about global

issues also includes emotional aspects due to the seriousness and complexity of these

problems (see for instance Ojala, 2013a; Eilam & Trop, 2011; Hicks & Bord, 2001; Persson,

Lundegård, & Wickman, 2011). In addition, studies have shown that many young people are

worried and pessimistic about the global future, not least when it comes to environmental

problems (Bentley, Fien, & Neil, 2004; Connell et al. 1999; Persson, Lundegård, & Wickman,

2011; Strife, 2012; Threadgold, 2012; Tucci, Mitchell, & Goddard, 2007). One could

therefore argue that focusing on hope about the global future should be a vital part of

EE/ESD.

There are researchers who claim that hope is most probably an important motivational

force when it comes to environmental engagement (Hicks, 2014; Lueck, 2007; O'Riordan &

Timmerman, 2001), while others claim instead that people are inclined to have an optimistic

bias concerning issues such as climate change and that this is a serious barrier to pro-

environmental actions (Gifford, 2011). Taking into account these mixed views about hope in

relation to climate change Ojala (2012a) argued that it is important to consider the different

sources that hope could be based on, since they are probably more or less constructive seen from the perspective of environmental engagement. Two different hope dimensions were identified: "constructive hope," which was positively related to pro-environmental engagement, and "hope based on denial of the seriousness of climate change," which instead was negatively related to engagement (Ojala, 2012a). One weakness of this study was that hope based on denial was measured by only one item, which could lower the reliability of this scale. In addition, how education about these issues is related to hope was not taken into account in the empirical part of the study. Thus, there is a need for further research. The aim of the present study is to develop a more reliable sub-scale about hope based on denial, to explore relations between the two kinds of hope, on the one hand, and students' environmental engagement and perceptions of how EE/ESD is performed in their school, on the other hand.

Educating for action competence

Since environmental problems are anchored both in our way of living and in the socio-economic structure of society, Jensen and Schnack (1997) argue that EE should help young people become capable of acting both at a personal and a societal level. Thus, one important aim is to educate for *action competence*. Taking on an action-competence approach means to aim at developing competences that are important for becoming an active democratic citizen in a global society riddled with complexity, uncertainty, and conflicting interests (Mogensen & Schnack, 2010). This implies an educational model that is participatory and democratic, and proponents of the action competence approach criticize educational models aiming at behavioral modification. Instead, this approach aims at strengthening abilities to deal in an active and constructive way with knowledge that is incomplete (see also Almers, 2013).

Jensen and Schnack (1997) divide the concept of action competence into four different components: besides focusing on *knowledge/insight* about the problems and giving the

students *action experiences,* they also include *agency and motivation* as well as working with *visions of the future* as important aspects of this educational approach. In this regard, it is argued that in order to lessen pessimism and/or indifference one should help students to envision alternative futures and educate them in "the language of possibility," which means that being critical is not enough; one must also help students to find an "optimistic vision of potential, a search for solutions and a positive direction" (Mogensen & Schnack, 2010, p. 71). In this regard, there is a close relation between action competence and hope concerning the global future (see also Persson et al., 2011).

What is hope?

Although there is no consensus on how to define hope, the view that hope consists of both cognitive and emotional components is preferred in this article (Lazarus, 2001). Lazarus sees hope as an emotion that is related to a cognitive appraisal pattern of wishing for a desired state to come true even though the odds are not greatly in favor of it, but also as a way to cope with negative states by hoping for a solution (Lazarus, 2001, p. 282). Thus, hope is a positive feeling about the future that is related to positive expectations about a desired goal.

Snyder (2000) has created a theory that proposes that the cognitive part of the hope concept contains of three different aspects: (1) a positive future goal – that which we want to happen, (2) pathway thinking – to be able to find ways to reach the desired goal, (3) agency thinking – to be able to motivate oneself to use these pathways (see also Snyder, Rand, & Sigmon, 2001). Concerning climate change, Ojala (2012a) pointed out that individual pathways are not enough to feel hope; one must also have faith that other, more powerful, societal actors will do their part in reaching the desired goal, for instance a world free from environmental problems or a sustainable future. This is the case since one cannot solve societal issues alone.

Often the motivational aspect of hope is emphasized, where it is said that the cognitive part of the hope concept enables people to figure out ways to reach desired goals and that the emotional part gives strength to act even if there are no certainties (McGeer, 2004; Snyder, 2000). Others, instead, make a connection between hope and unrealistic optimism and denial (See Snyder et al. [2002] for a review). Some claim that one important barrier for people to take climate change seriously and to act in a pro-environmental way is that people in general have an optimistic bias where personal risks are de-emphasized (Gifford, 2011). In order to understand these different ways of looking at hope, it could be beneficial to turn to accounts that perceive hope as not only an emotional/cognitive concept, but also as a way to cope with difficulties.

Hope and emotion regulation

When it comes to dealing psychologically with threats and problems, focusing on how one can contribute to the solutions of the problem and doing something concrete concerning it, i.e., using problem-focused coping, is just one way to cope (Lazarus & Folkman, 1984). People can also utilize emotion-focused coping where the main focus is on getting rid of negative emotions, even if it means denying the problem altogether. Another way to cope is to utilize meaning-focused coping, where one uses different strategies to evoke positive emotions, such as hope, alongside the negative emotions, helping one to face and bear the negative emotions and, thus, indirectly promote problem-focused efforts (Folkman, 2008). Hope in relation to climate change could be related to all of these coping strategies.

In a qualitative study with different age groups of young people, diverse pathways, or sources of hope concerning climate change, were distinguished (Ojala, 2012b). Most commonly, hope was evoked by meaning-focused strategies consisting of actively putting trust in different societal actors, such as politicians and researchers, but also of positive reappraisal, where the problem was acknowledged, but where the young also were able to

switch perspectives and see positive trends concerning climate change. Hope was also evoked by problem-focused coping where the young had faith in their own and other laypeople's ability to do something concerning climate change. Finally, hope was sometimes related to strategies of de-emphasizing the seriousness of climate change by claiming that the problem is exaggerated or that it does not concern oneself, a kind of emotion-focused coping.

In a questionnaire study the different sources of hope fell into two separate sub-scales: one "constructive hope scale" based on items related to trust in oneself and other societal actors as well as positive reappraisal, and one scale called "hope based on denial," which included one item about feeling hope because one does not think that climate change is as big of a problem as certain researchers claim (Ojala, 2012a). Constructive hope was found to be positively related to environmental engagement, while hope based on denial had a negative relation to environmental engagement. Since, denying the seriousness of climate change is a multidimensional concept (see Poortinga et al., 2011) it was pointed out that in future studies this hope dimension ought to be captured with more items in order to increase the reliability and validity of the scale. In addition, how these two dimensions of hope are related to different educational approaches is interesting to explore.

Socializing emotion regulation in the classroom

Emotion regulation and coping take place not only at an individual level, but are also social processes (Folkman, 2009). Most studies on how young people's emotion regulation is influenced by other persons have focused on the social influence of parents. For instance, how parents react to negative emotions expressed by their children has been found to influence if their children will be able to cope with negative emotions in a constructive way or not (Eisenberg, Cumberland, & Spinrad, 1998; Gottman, Katz, & Hoven, 1996; McElwain, Halberstadt, & Volling, 2007). If parents accept negative emotions, help their children to put them into words and to problem-solve and use emotions to promote learning, this is associated

with more constructive individual strategies among the children, while if parents ignore, dismiss or make fun of their children's negative emotions there is a risk that the children will do poorly in regulating these emotions. Another way that parents' can influence their children's regulation of emotion is by being role models, showing how to cope in a constructive way through how they themselves act and talk about the stressor at hand (modeling) (Eisenberg et al., 1998).

Studies show that when global environmental problems are taken up in school, emotional reactions in the classroom are quite common (see for instance Taber & Taylor, 2009; Persson et al., 2011; Öhman & Östman, 2008). Taking the studies on parents and children into account, one can imagine that teachers could influence their students' emotion regulation concerning climate change, including ways of evoking hope, by how they react to emotional displays by their students and by how they talk and act concerning these issues (modeling). Studies on younger children and about emotions concerning more mundane issues show that teachers more or less consciously create emotion norms in the classroom, for example by indicating which way is the right way to regulate emotions, which emotions are proper to express, and whose emotions are worth taking seriously and whose are not (Cekaite, 2013; Fried, 2011). Although there are few studies in this area of research, they indicate that the ways teachers react to their students' negative emotions are important for both the children's emotional competence and for learning (Curby, Brock, & Hamre, 2013; Denham, Bassett, & Zinsser, 2012). No study, however, has been performed on how students perceive that their teachers are reacting to their negative emotions in relation to larger societal issues and if teachers are perceived as having a solution-oriented and engaging manner when talking about these problems or if they instead mostly focus on gloom and doom and how these emotion norms are related to students' hope.

The future dimension in ESD and pathways to sustainable development

Researchers such as Hicks (2002, 2014; see also Torbjörnsson & Molin, 2013) have pointed to the importance of discussing future dimensions in the classroom in order to promote hope concerning global problems. This accords with both the action-competence approach, where developing preferred visions of the future is a vital aspect (Mogensen & Schnack 2010), and with Snyder's theory in which desired goals are an important part of the hope concept (Snyder, 2000). However, whether a focus on the future in school is related to hope and, if so, in what way has not been investigated in quantitative studies before.

Snyder's hope theory points to the importance of finding pathways to reach a desired goal in order to feel constructive hope (Snyder, 2000). Thus, it is interesting to investigate if hope concerning climate change is related to a teacher approach that allows students to discuss different pathways to sustainable development. Finally, since earlier studies have indicated that there are gender differences when it comes to both coping (Eschenbeck, Kohlman, & Lohaus, 2007) and environmental engagement (Torbjörnsson, Karlberg, & Molin, 2011; Zelezny, Chua, & Aldrich, 2000), it is also of interest to find out if differences exist between boys and girls when it comes to the two dimensions of hope.

Aims of the study

The first aim is to investigate if it is possible to replicate the results from the study in which hope concerning climate change fell into two sub-scales: "constructive hope" and "hope based on denial" (see Ojala, 2012a). The objective is also to create a more reliable scale concerning hope based on denial. If the hope scale falls into two reliable subscales, the second aim is to investigate if the results concerning hope and environmental engagement identified in the study by Ojala can be replicated.

The third aim is to explore if these hope sub-scales have any significant relations to how young people perceive that EE/ESD is conducted in their school. Here, students' subjective perception of teachers' reactions will be in focus, since studies indicate that it is often the

students' own active interpretations that will form the most important basis for how they will act and what attitudes they will develop (see Bundick & Tirri, 2014). Three aspects will be in focus: (1) teacher-induced emotion norms: both perceived reactions to negative emotions and a positive or negative focus when discussing societal issues (modeling); (2) the future dimension in ESD; and (3) discussing pathways to sustainable development.

The fourth aim is to investigate if gender has an influence on the two hope dimensions. In addition, a possible association between hope concerning climate change and a more general feeling that you can influence your own life (self-efficacy) will be investigated since Snyder (2000) emphasizes the close relation between agency and hope.

Method

Procedure and participants

The target group consisted of 624 senior high-school students living in 22 communities in Sweden. The average age was 18 (SD=.71) and the sample included 59 % girls and 41 % boys. Both college-preparatory classes and vocational classes were included in the study. Still, the sample should be seen as a convenience sample, not least since we cannot report an exact response rate. The students answered an online questionnaire at their school and were guaranteed anonymity. They did not receive any incentive to take part in the study.

Measures[i]

Environmental engagement was measured with five items based on Torbjörnsson et al. (2011): "If I had extra money, I would give some to protect the environment." "I try to convince other people that nature is important." "To save energy in the winter, I make sure that the heat in my room is not on too high." "To save energy, I always turn of the light in my room when I don't need it anymore." "I try to save water by taking shorter showers or by turning of the water when I brush my teeth." The items were followed by the alternatives: "Doesn't apply at all = 1," "Doesn't apply so well = 2," "Kind of applies = 3," "Applies quite

well = 4," "Applies perfectly = 5." Cronbach's alpha was .78. To capture the political dimension the following statement was also included in the study: "The political party I will vote for should work for a sustainable development." The item was followed by the same alternatives as above and they were also used in the following three scales:

Self-efficacy was measured with one item taken from Ungdomsstyrelsen (2010): "I have good opportunities to influence my own life-situation."

Teachers' accepting or dismissive attitudes toward negative emotions were captured by the stem question: "Think about how your teachers talk about societal issues and environmental issues in the classroom" followed by four items: (1) "If I express negative emotions such as worry or anger in the face of a societal or environmental problem, I have teachers who encourage me to say more about why I feel the way I do." (2) "If I wanted to discuss negative emotions such as worry or anger in the face of a societal or environmental problem, most of my teachers would <u>not</u> take me seriously." (3) "If I wanted to talk about negative emotions such as worry or anger in the face of a societal or environmental problem, there are teachers who would listen to me and take my emotions seriously." (4) "If I wanted to talk about negative emotions such as worry or anger in the face of a societal or environmental problem, most of my teachers would probably think I'm being silly."

A PCA (principal component analysis) showed that the four items fell into two components, and therefore two scales were created: *Accepting emotion norm* with a Cronbach's alpha of .61 (item 1 and item 3) and *Dismissive emotion norm* with a Cronbach's alpha of .72 (item 2 and item 4).

Teachers' positive or negative outlook concerning societal issues was measured by the following five items concerning a positive and solution-oriented outlook: "I have teachers who take up things that are being done to alleviate various societal and environmental problems, such as political or scientific progress." "I have teachers who talk about societal

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and environmental issues in an involved and thought-provoking way." "I have teachers who take up how you as a young person can alleviate various societal and environmental problems." "There are teachers who talk about societal and environmental issues in a way that awakens positive emotions in me." "I have teachers who in talking about societal and environmental problems in the classroom indicate possible ways to solve those problems in the future."

And with the following three items for a negative outlook[ii]: "Most of my teachers focus primarily on how hopeless everything is when they talk about societal and environmental issues." "Most of my teachers often convey an extremely negative and gloomy picture of the future when they talk about societal and environmental issues." "When it comes to societal and environmental issues, most of my teachers talk almost exclusively about all the terrible things that are happening in the world."

A PCA was performed and the items fell into two components. Therefore, two scales were created: *teachers' positive outlook* with Cronbach's alpha .80 and *teachers' negative outlook* with alpha Cronbach's .76.

Future orientation in school was measured with the stem question: "How often have you had classes that dealt with?" This was followed by two items: "What I can do to influence our common future." "What I prefer our common future to look like." The items were assessed on a 4-point scale: "never = 1," "seldom = 2," "sometimes = 3," "often = 4". Cronbach's alpha was .73.

Discussing pathways to SD in school was captured by the same stem question as above, followed by the items: "What I can do to contribute to sustainable development." "What we together can do to contribute to sustainable development." "How people are working for sustainable development in other parts of the world." For each item the young people were

asked to choose from the following alternatives: "never = 1," "seldom = 2," "sometimes = 3,"

"often = 4". Cronbach's alpha was .87.

Results

The hope scale

Hope is perceived as a continuous concept ranging from low levels of hope to high levels

of hope (see Ojala, 2012a). Hope was measured by 12 items capturing different sources of

hope. Nine of these were taken from Ojala (2012a) and three items were created for this study

aimed at getting at different dimensions of hope based on denial (items 4, 8, 12).

The stem question was: "I feel hope concerning climate change": (1) "Because I believe

that research and technical solutions will contribute to the improvement of the climate change

problem" (trust-others). (2) "Because I do <u>not</u> think that climate change is as big of a problem

as certain researchers claim" (denial). (3) "Because we as individuals can change our

behavior; together we can influence climate change in a positive direction" (trust-self). (4)

"Because I believe that climate change is natural and I doubt that climate change is caused by

emissions that we humans create" (denial). (5) "Because the awareness about this problem has

increased considerably during recent years" (positive reappraisal). (6) "Because politicians in

more and more countries take climate change seriously" (trust-others). (7) "Because

ultimately we will be forced to take climate problems seriously and to take our responsibility"

(positive reappraisal). (8) "Because I doubt that there is any change in the climate" (denial).

(9) "Because as long as there are people who are active in environmental organizations there

is a possibility that the climate issue will be solved" (trust-others). (10) "Because I know that

there are a number of things that I myself can do to contribute to the improvement of the

climate change problem" (trust-self). (11) "Because I try to focus on positive news about

climate change in the media" (positive reappraisal). (12) "Because I think it's a good thing that the summers in Sweden are getting warmer as a result of climate change" (denial)[iii].

In response to the question: "To what extent do these statements correspond to how you are thinking?" respondents rated each source of hope on a 7-point Likert-scale ranging from "not at all = 0" to "very well = 6." A Kaiser-Meyer-Olkin measure of sampling adequacy, .84, showed that the data was suitable for performing a factor analysis. A principal factor analysis with principal axis factoring (PAF) as the extraction method and with oblique oblimin as the rotation method was performed[iv]. In this process one item who loaded on both scales was removed (item 11). With this item excluded, using Kaiser's eigenvalue criterion, the items fell out in two separate factors. This factor solution accounted for 60.6 % of the total variance and the factor loadings were satisfactory (.50 or greater) (see Table 1). Thus, two hope-scales were created: (1) *Constructive hope* (α=.85), (2) *Hope based on denial* (α=.86).

Insert Table 1 about here

How do the two hope sub-scales relate to environmental engagement?

First, Pearson correlation analyses were performed. As can be seen in Table 2 the more constructive hope the students possess, the more probable it is that they will behave pro-environmentally in everyday life and plan to vote for a political party that works for a sustainable future. When it comes to hope based on denial, the correlations are also significant, but the opposite pattern is visible: those young persons who score high on this scale are also less prone either to behave pro-environmentally or to plan to vote for a party that works for a sustainable future.

Insert Table 2 about here

How do self-efficacy and perceived approaches to EE/ESD relate to the two hope

dimensions?

Table 2 shows that the more constructive hope the students experience, the more probable
it is that they feel that they can influence their own life situation to a high degree, that they
perceive their teachers as accepting their negative emotions in relation to societal issues and
as having more positive and solution-oriented styles when it comes to these issues, and that
the students have the view that pathways to SD and future dimensions are discussed a lot in
school. There is also a significant positive, though weak, correlation with the perception that
their teachers have a gloom-and-doom style when talking about these issues.

In order to find out the relative importance of these aspects in explaining constructive
hope, they were included in a hierarchical regression analysis, where gender and self-efficacy
were inserted as control variables in the first step. As can be seen in Table 3, self-efficacy is a
significant positive predictor in step one, while gender is not significant. In step two, we can
see that self-efficacy loses its unique influence, while teachers' acceptability of negative
emotions and teachers' positive and solution-oriented outlook concerning societal problems
have unique positive impacts on constructive hope. The other variables have no unique
influence on constructive hope. This model explains 17 % of the variance in constructive
hope, $F (7, 532) = 15.12; p < .001$.

Insert Table 3 about here

In Table 2 we can also see that the more the students feel hope based on denial, the more likely it is that they will experience a low degree of self-efficacy in general, perceive their teachers as dismissive of their negative feelings concerning societal problems and as having a negative outlook concerning these issues, and to think that there is not much talk about paths to SD in school. The variables that had significant relations with hope based on denial, were then included in a regression analysis with gender and self-efficacy as control variables. In Table 4 it can be seen that boys are more inclined than girls to base their hope on denial, and that self-efficacy also is a significant negative predictor. However, in step two only the three school aspects are unique significant predictors, out of which perceiving that your teachers have a dismissive attitude toward your negative feelings is the most important predictor. This model explains 36 % of the variance in hope based on denial, $F (5, 544) = 60.18; p < .001$.

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Insert Table 4 about here

Explaining the gender difference in hope based on denial

Since gender lost its influence on hope based on denial when the school-oriented variables were inserted into the model, one interesting question is if one or several of these variables can explain why boys utilize hope based on denial more than girls. Thus, mediation analyses were performed (see Baron & Kenny, 1986). First, the three school variables were regressed on gender in separate analyses. Only when it comes to perceiving your teachers as having a dismissive attitude toward negative emotions was there a significant effect of gender, $\beta = .17; p < .001$. Hence, only this aspect was included in further analyses. First, gender was inserted into the model and was found to have a significant effect on hope based on denial, $\beta = .12; p < .01$. Thereafter, the possible mediator was inserted into the model. After

introducing "perceiving one's teachers as having a dismissive attitude toward negative emotions" as a predictor, the explanatory effect of gender became non-significant, $\beta = .03$; $p = .324$. Thus, teacher's dismissive emotion norm completely mediated the effect of gender on hope based on denial. A Sobel test supports this result, $z = 3.80$; $p < .001$. This result can be interpreted in the following way: The boys perceive that their teachers are dismissive of their negative emotions to a higher degree than the girls, which explains why they feel hope based on denial to a higher extent.

Discussion

This is the second study indicating that the debate about whether hope concerning climate change is something beneficial for environmental engagement or whether it is rather related to unrealistic optimism and disengagement is simplified. Hope can be both positively and negatively related to engagement depending on the characteristics of the more specific sources of hope, or pathways to hope. The study supports the results from Ojala's (2012a) study in which hope based on positive reappraisal and trust in laypeople's and other societal actors' capability was a motivational force, while hope based on denial of the seriousness of climate change had a negative association with environmental engagement. The present study also extends these results to the political sphere by demonstrating that young people who experience a high degree of constructive hope are also more inclined to indicate that they will vote for a party that works for SD, while the opposite pattern is true for those young people who use hope based on denial to a large extent. Thus, the view that trust in technological development and science as well as other societal actors is a way to escape assuming responsibility concerning environmental issues (see for instance Gifford, 2011; Lorenzoni, Nicholson-Cole, & Whitmarsh, 2007) is refuted by this study, since trust is an important aspect of the constructive hope concept. It is probably necessary to have faith that other more

powerful actors will do their part concerning climate change in order to feel that it is worthwhile being engaged (see Ojala, 2012a, 2012b).

This study is the first to explore the relation between EE/ESD in school and the two hope dimensions, and it supports the arguments put forward by different researchers that it is vital to discuss our common future and pathways to SD in schools in order to promote constructive hope concerning global problems (Hicks, 2002; Mogensen & Schnack, 2010, Torbjörnsson & Molin, 2014). The study also shows that if students perceive that discussing pathways to SD is rare in school, they experience hope based on denial to a higher degree. This result could perhaps be explained by theories and studies showing that if people do not know of any ways of solving a problem, i.e. feel less in control, they are also more inclined to cope with the problem in defensive ways (Ojala, 2013b; Folkman & Lazarus, 1980; Stern, 2012).

The perhaps most interesting result in this study is that how students' perceive that their teachers communicate about emotions in relation to societal problems is an important aspect explaining whether the students feel constructive hope or not, but also if they will base their hope on denial or not. Thus, if teachers want to promote constructive hope concerning climate change, it is wise to take into account negative emotions evoked by information about this problem among the students, to take these emotions seriously, and to use them as "teachable moments" (see Ojala, 2013a; Pacifici & Garrison, 2004). This approach has been found to be important for constructive emotion regulation among children when it comes to more mundane everyday emotions (Eisenberg et al., 1998; Gottman et al., 1996; McElwain et al., 2007). However, the present study indicates that this is perhaps also true concerning larger societal issues. The results of the study also suggest that teachers should communicate about these problems in a more solution-oriented and positive way, since this seems to go together with students' feeling a great deal of constructive hope. This is in line with how parents and

teachers influence young people's emotion regulation about more mundane issues by how they themselves act and communicate (see Eisenberg et al., 1998; Ceikate, 2013).

In addition, this study shows that young people who feel hope to a high degree because they deny the seriousness of climate change feel they have less influence over their own life compared to young people who do not base their hope on denial. Hence, this study extends the results from earlier studies that have found that de-emphasizing the seriousness of climate change goes together with a low degree of environmental efficacy (Ojala, 2012, 2013b) to concern a more general feeling of low self-efficacy. This further emphasizes the importance of applying an "action competence approach" when educating about these issues, in order to help these young people to feel empowered (Jensen & Schnack, 1997; Mogensen & Schnack, 2010). In this way, the need to use hope based on denial could perhaps be reduced.

Moreover, if students' perceive that their teachers talk about societal problems in a gloom-and-doom way, they are more inclined to use hope based on denial, giving further support to arguments that this kind of hope is an emotion-focused coping strategy aimed foremost at getting rid of negative emotions (Ojala, 2012b). Surprisingly, this gloom-and-doom way of teacher communication style also had a weak positive correlation to constructive hope. Perhaps young people who have the capability of coping in this more constructive way are more inclined to use this coping strategy if they perceive that their teachers emphasize the more worrying parts of climate change and other societal problems to a large extent.

The most important factor that explained the use of hope based on denial was whether students perceived that their teachers do not take their negative emotions concerning societal problems seriously. This was also the factor that explained why boys felt hope based on denial to a higher degree than girls did. Hence, it is important for teachers to be aware of how they react to negative emotions in the classroom and to think about whether they might be treating different groups, such as boy and girls, differently when it comes to taking negative

emotions seriously. This is important in order for all voices to be heard and for the ideal of a participatory and democratic approach to EE to be realized (see Ojala, 2013a, Öhman & Öhman, 2013).

This study has some limitations that should be mentioned. Since it is exploring a new area of research, some of the scales were created specifically for this study. Thus, although the reliability of the scales was satisfactory[v], in future studies they should be further validated, not least the communication scales. Also, the association between constructive hope and environmental engagement was weaker than in the study by Ojala (2012a), which could be due to the use of a different engagement scale measured in a more attitude-like style. In addition, since this study is cross-sectional, in an empirical sense it cannot show in which direction the influence goes, only point to significant correlations between different variables. Thus, longitudinal and/or experimental studies should be performed in the future to further support the theoretical arguments. It would also be interesting to conduct classroom studies in order to investigate how socialization processes around these issues take place in vivo. Since newer theories emphasize the bidirectional character of socialization (Gottman et al., 1996; Magnusson & Stattin, 1998), this would make it possible to study in more detail how students react to teacher-induced emotion norms and also whether and how they are influencing their teachers' communication of emotion.

Finally, what implications does this research have for teacher education? Ojala (2013b) argued that education for "emotional awareness" should be seen as one important part of ESD. In addition, one could maintain that a focus on emotions should be a specific part of teacher education. This includes educating future teachers about different ways that young people deal with emotions in relation to societal problems and how these strategies could influence the learning process. Another important aspect is to make the teacher students aware of their own emotions and emotion regulating strategies about problems such as climate

change. This is important since Lombardi and Sinatra (2013) have shown that teachers'
emotions concerning topics such as climate change have an impact on their communication
with their students. Thus, in order to promote competences that are important for students to
become active democratic citizen "emotional awareness" is important at all levels of
education.

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Table 1

The two-factor solution of the hope scale

Factor labels and sub-scales	Principal axis factoring	
	Hope (contructive)	Hope (denial)
Hope- trust in technology	**.58**	.01
Hope- not a big problem	-.01	**.85**
Hope- we can influence	**.75**	-.03
Hope- the problem is natural	-.03	**.85**
Hope- awareness has increased	**.78**	-.08
Hope- trust in politicians	**.63**	.15
Hope- eventually	**.65**	-.09
Hope– doubt there is a problem	-.04	**.78**
Hope- trust in env. org.	**.67**	.10
Hope- I can contribute	**.68**	-.02
Hope – summers get warmer	.07	**.67**
Percent of variance explained	36.25	24.32

Note. Principal factor analysis has been used as the extraction method, the rotation method is OBLIMIN.

Table 2

Pearson correlations between the two hope scales, on the one hand, and environmental

engagement, self-efficacy and perceptions of EE/ESD in school, on the other

	Pearson correlation coefficients (r)	
	Constructive hope	Hope based on denial
Accepting emotion norm	.34***	-.04 (n.s.)
Dismissive emotion norm	.03 (n.s.)	.59***
Teachers' positive outlook	.42***	-.02 (n.s.)
Teachers' negative outlook	.09*	.43***
Future orientation in school	.22***	.03 (n.s.)
Discussing pathways to SD	.26***	-.13***
Environmental engagement – private sphere	.22***	-.16***
Environmental engagement – voting intention	.16***	-.36***
Self-efficacy	.14***	-.14***

Note. *p<=.05; **p<=.01; ***p<=.001

Table 3

Multiple regression analysis - constructive hope

	Step 1	Step
	β	β
Gender (girl = 0; boy = 1)	.03	.01
Self-efficacy	.13**	.08
Accepting emotion norm		.14**
Teachers' positive outlook		.24***
Teachers' negative outlook		.02
Future orientation in school		-.01
Discussing pathways to SD		.09
R²	**.02****	**.17*****

Note. *p<=.05; **p<=.01; ***p<=.001

Table 4

Multiple regression analysis - hope based on denial

	Step 1	Step
	β	β
Gender (girl = 0; boy = 1)	.12**	.03
Self-efficacy	-.14***	-.04
Dismissing emotion norm		.48***
Teachers' negative outlook		.14***
Discussing pathways to SD		-.09*
R^2	**.03***	**.36***

Note. *p<=.05; **p<=.01; ***p<=.001

[i] The arithmetic mean of the items in the scales for every person was used to create aggregated measures.

[ii] The positive and the negative items were mixed in the questionnaire

[iii] In the questionnaire the items were presented in the same order as in this paper

[iv] The reason for using PAF instead of PCA was that PAF can be used as a form of confirmative factor analysis, confirming the two factor solution found in Ojala (2012a)

[v] Although it is often said that the lower limit for an acceptable Cronbach's alpha is .70, in explorative research over .60 is deemed to be acceptable (Hair et al., 1998, 118).