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Hope and climate change: the importance of hope for environmental engagement among young people

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Although many young people think climate change is an important societal issue, studies indicate that pessimism is quite common. Finding ways to instill hope could therefore be seen as vital. However, is hope positively related to engagement or is it only a sign of illusory optimism? The aim of the study was to explore if hope concerning climate change has a significant relation to pro-environmental behavior as well as an impact on behavior when controlling for already well-known predictors such as values, social influence, knowledge, and gender. Two questionnaire studies were performed, one with a group of Swedish teenagers ($n=723$) and one with a group of Swedish young adults ($n=381$). ‘Constructive’ hope had a unique positive influence on pro-environmental behavior. Hope based on denial, however, was negatively correlated with pro-environmental behavior in the two samples and was a significant negative predictor in the teenage group. The conclusion is that hope is not only a pleasant feeling but could also work as a motivational force, if one controls for denial. Implications for education concerning sustainable development are discussed.

Keywords: hope; global climate change; pro-environmental behavior; education for sustainable development; climate skepticism

Introduction

Global climate change is one of the most serious threats that humanity is facing today. Since this problem is intertwined with the global pattern of production and consumption, besides technical and political progress, it is vital to get the public involved in the efforts to achieve an ecologically sustainable society. Because young people are those most likely to suffer the negative consequences of climate change, and since they are the future leaders of society, one could argue that this group is especially important to include in societal deliberations about this issue.

Unfortunately, studies have found that although many young people show an interest in global problems, feelings of hopelessness, pessimism, and helplessness, as well as inactivity are common (Bentley, Fien, and Neil 2004; Connell et al. 1999; Eckersley 1999; Fleer 2002; Hicks 1996, 2001; Tucci, Mitchell, and Goddard 2007). For example, an Australian study found that among a group of 10–14-year-olds about 27% believed that the world may end during their lifetime due to climate change and

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other global threats (Tucci, Mitchell, and Goddard 2007). In addition, a German study showed that although young people are optimistic about their own future, two-thirds think climate change threatens human existence (Albert, Hurrelmann, and Quenzel 2010). Pessimism seems to be particularly strong when it comes to environmental problems (Hicks and Holden 2007) and research has shown that education about global issues sometimes increases these negative feelings (Hicks and Bord 2001). Finding ways to instill hope could therefore be seen as vital.

Few empirical studies have explored how hope relates to engagement concerning global environmental problems. This is regrettable because it is not certain that all sources of hope have a positive effect on engagement since hope could also be based on denial (for reviews, see McGeer 2004; Snyder et al. 2002). The present study overcomes this gap in the literature by focusing on hope concerning climate change and its relation to private-sphere pro-environmental behavior¹ among two groups of young people: one of teenagers and one of young adults. The aim was to explore if hope has a significant impact on pro-environmental behaviors when controlling for already well-known predictors and when taking into account hope based on denial of the seriousness of climate change.

Previous studies about pro-environmental behavior

Research about private-sphere environmentally friendly behavior – such as recycling, buying ecological products, and saving energy – has mostly focused on adults. Some factors that seem to be important for explaining whether or not people will behave pro-environmentally are age and gender (Biswas et al. 2000; Diaz Menses and Beerli Placio 2005; Zelezny, Chua, and Aldrich 2000); knowledge (Barr 2004; Hornik and Cherian 1995; Meinhold and Malkus 2005; Young et al. 2010); social influence (Göckeritz et al. 2010; Hornik and Cherian 1995; Nolan et al. 2008); and habits (Biswas et al. 2000; Knussen et al. 2004). Altruistic concerns have also been investigated (for a review, see Kollmus and Agyeman 2002). Here, there has been a specific focus on other-oriented values of both an altruistic kind – for instance valuing justice and equality highly – and a biospheric kind – for instance valuing environmental protection and living in harmony with nature highly. Several studies have found these values to be positively associated with different kinds of pro-environmental behaviors (Nordlund and Garvill 2002; Pahl et al. 2005; Poortinga, Steg, and Vlek 2004; Stern and Dietz 1994). When it comes to young people and factors explaining environmental engagement and social engagement in general, social influence from parents and peers has been identified as especially important (Dostie-Goulet 2009; Grønhøj and Thøgersen 2009; Pancer et al. 2007; Smetana and Metzger 2005; Zaff, Malanchuk, and Eccles 2008). Thus, factors both external to the individual and residing within the individual seem to motivate pro-environmental behavior.

There is, however, a shortage of studies focusing on emotions and environmental engagement. Hope, for example, could be a factor complementing values, knowledge, and social influence in predicting engagement concerning global environmental problems. Climate change can be seen as an existential issue closely connected with uncertainty about the future survival of our planet and therefore as evoking feelings of existential anxiety and hopelessness. Here, hope about a better, alternative, future could play an important part in motivating people to take action concerning global problems (see for instance Bentley, Fien, and Neil 2004; Hicks 2001).

Hope as a scientific concept

The hope concept is obviously complex; including for instance emotional, cognitive, existential, identity-related and social aspects. One way to make this concept manageable for scientific investigation is presented in the most well-known psychological theory about hope developed by Snyder (2000) and Snyder, Rand, and Sigmon (2001). This theory proposes that hope consists of three different components: goals – that which we want to happen; pathway thinking – an ability to come up with routes to get to where we want; and agency thinking – the motivation to use these pathways. Thus, hope arises when a positive goal is felt as being within reach (Snyder, Rand, and Sigmon 2001). Hope concerns ideas of the future and therefore includes strong cognitive dimensions, but it is also emotional. Hope is imbued with a positive feeling about the future; it is a kind of a conviction about the unproven (McGeer 2004). In this paper the focus will be on the cognitive and emotional components of hope.

How, then, does hope relate to motivation? In health psychology, researchers in empirical studies have found that people with high levels of hope take in more information about how to protect themselves from illnesses, and use this information in a more active way than those low on hope (Snyder, Rand, and Sigmon 2001). They have a capacity for constructive thinking about how to deal with the problems (Drach-Zahavy and Somech 2002). People feeling a high degree of hope take action, and have the ability to figure out ways to reach their desired goals (Snyder 2000). The emotional character of the hope concept is a strong motivational force which gives energy to act even in the absence of certainties (Courville and Piper 2004; McGeer 2004). Hence, does hope perhaps also motivate social engagement?

Hope and pro-environmental behavior

Researchers have argued that hope ought to be important for environmental engagement (Lueck 2007), however, few empirical studies have been performed in order to test this proposition. One exception is a study which explored the relation between hope and worry² concerning global environmental problems and pro-environmental behavior among 422 young adults in Sweden (Ojala 2008). This study found that hope – measured in a simple way by asking subjects to rate how much hope they felt about the environmental problems – had no relation to behavior. However, an interaction effect between worry and hope was identified, showing that for individuals highly worried about the global environmental problems, hope was positively related to behavior, while for individuals feeling a low degree of worry, hope was negatively related to behavior. Thus, hope combined with a low degree of worry seemed to make the young adults reluctant to behave in a pro-environmental fashion, perhaps because they denied the problems.

These results are in line with critical voices about the hope concept claiming that in some cases it could be related to unrealistic optimism³ and denial (see Snyder et al. [2002] for a review). Here, hope is perceived as shallow, unimportant, and in the worst case related to wishful thinking instead of agency (McGeer 2004). This could be particularly true when it comes to global environmental problems, since empirical studies have shown that people quite often use various cognitive strategies, such as denial or externalization of responsibility, to psychologically cope with the existence of climate change (Homburg, Stolberg, and Wagner 2007; Lorenzoni,

Nicholson-Cole, and Whitmarsh 2007; Stoll-Kleeman, O'Riordan, and Jaeger 2001). In light of these diverging opinions about the importance of hope for agency, it seems important to explore the underlying sources of hope concerning climate change because they can probably have both positive and negative effects on pro-environmental engagement.

Sources of 'constructive' hope concerning the global environment

In a study with 21 Swedish young people engaged in environmental organizations (Ojala 2007a, 2007b) and a study including 10 Swedish young people highly devoted to private-sphere environmental behavior (Ojala 2007b, 2008) semi-structured interviews were performed in order to explore sources of hope concerning global environmental problems, sources that due to the chosen sampling strategy most probably are positively related to engagement. In accordance with Snyder's hope theory (Snyder 2000; Snyder, Rand, and Sigmon 2001), the sources of hope that the young people in these two studies mentioned were perceived as abilities to come up with alternative pathways to reach desired goals, in this case, a future less burdened by global environmental problems.

Three main hope themes were identified (see Ojala 2007b, 105–7). The first theme was called *positive re-appraisal*.⁴ Here, the young persons, after describing their worries about the environmental problems, thought about them in a different way so to also activate hope. This theme included strategies such as putting things into a historical perspective by thinking that the awareness of climate change has increased during recent years and forcing oneself to focus on the positive aspects of the problem. Similar strategies used to cope with interpersonal stress have been found to be related to positive emotions and optimism (Folkman 2008). The second hope theme concerned *trust in sources outside oneself*. This covered, for instance, trust in technology and trust in environmental organizations. This result is in accordance with a study by Fleer (2002) showing that it is quite common among young people to put their trust in technological solutions of environmental problems. However, the question of whether this trust is actually beneficial for environmental engagement, or is instead used to escape personal responsibility, has not been investigated. Finally, the third hope theme concerned *trust in one's own ability to influence environmental problems in a positive direction*. For instance, the young people believed in the aggregated and long-term efficacy of everyday actions such as recycling. Although not directly mentioned in relation to hope, researchers have argued that it is vital to teach young people action competence in order to encourage empowerment and avoid cynicism (for a review, see Bentley, Fien, and Neil 2004).

Aims and research questions

In this paper the different sources of hope identified in the qualitative studies mentioned above were measured quantitatively in two questionnaire studies aimed at a group of teenagers and a group of young adults, respectively. The aim was to explore whether an aggregated, measure of 'constructive' hope concerning climate change – based on positive re-appraisal, trust in different societal actors, and trust in the efficacy of individual action – has a significant relation to pro-environmental behavior, and whether it explains behavior when controlling for already known

predictors of environmental behavior such as values, social influence, knowledge, and gender, as well as hope based on denial. In other words, is hope an important explanatory factor concerning environmental engagement among young people or is it just a pleasant feeling?

Method

In this section, first the design of the study on the teenagers is described and, thereafter, the design of the study on the young adults is presented. The rationale behind choosing these two age-groups was to explore if hope has the same relation to environmental engagement both in a group of young people who still live together with their parents and among young people who have moved from their childhood homes.

It is important to mention that both studies were performed in Sweden, a country where environmental policies in recent decades have increasingly focused on proactive measures and where it is seen as vital to influence and change people's everyday behaviors (Gustavsson 2008). More so than many other countries, Sweden can be classified as a climate friendly country at all levels of society (Gustavsson 2008), although people's worries about climate change and environmental issues in general have decreased slightly in recent years (Holmberg, Weibull, and Oscarsson 2011).

The teenage sample

Participants and procedure

The data were taken from a questionnaire study conducted at six schools in one medium-sized community and two small communities in central Sweden. The sample consisted of 723 students, of which 208 were senior high-school students (29%) and 511 were junior high-school students (71%).⁵ The average age was 15.24 (SD = 1.61) and the sample included 366 girls (51%) and 354 boys (49%).⁶ To attain a representative distribution with respect to socioeconomic factors when it comes to the senior high-school students, both collegiate preparatory and vocational classes were included in the study. The participation rate was 83%. Parents of the junior high-school students were informed about the study ahead of time. The young people filled out the questionnaires during regular school hours, and were assured of anonymity. Participation was voluntary. Each class that participated was paid approximately 100 Euro for collective use independent of how many of their students that took part of the study.

Measures

Hope concerning climate change was measured with 10 items representing different sources of hope. Hope is not seen as an either-or phenomenon, but as a continuous emotional-cognitive concept ranging from very low levels of hope to very high levels of hope. Nine of the included items were developed from the results of two interview studies with young people who were both highly hopeful and actively engaged concerning the global environmental issue. The 10th item was developed to capture a more 'negative' source of hope, namely denial of the seriousness of climate change.⁷ The sources of hope were, 'I feel hope concerning climate change':

- (1) 'Because humanity has confronted complex and seemingly hopeless societal problems before and has been able to solve them eventually' (positive reappraisal).
- (2) 'Because I do not 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 research and technical solutions will contribute to the improvement of the climate change problem' (trust-others).
- (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 even though there is a risk that humanity will go under due to this problem, nature will survive' (positive reappraisal).
- (8) '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).
- (9) '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).
- (10) 'Because I try to focus on positive news about climate change in the media' (positive reappraisal).

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' to 'very well.'

Thereafter, an aggregated 'constructive' hope scale was constructed. First, a principle component analysis with a Varimax rotation was performed in order to create a consistent scale. In this process two items were removed (items 1 and 7). With these items excluded a two-factor structure was suggested by the Eigenvalue criterion. This factor solution accounted for 65% of the total variance and the factor loadings were also satisfactory ($\pm .50$ or greater) (see Table 1). One factor contained the item about not believing that climate change is a big problem and the other factor contained all the other items. By taking the mean of these seven items a constructive hope scale was developed. The Cronbach's alpha of the scale was .89.

Table 1. The two-factor solution of the hope scale with rotated factor loadings.

Factor labels and sub-scales	Principal component analysis	
	Hope (constructive)	Hope (denial)
Hope: denial	.02	.98
Hope: we can influence	.84	-.07
Hope: trust in technology	.74	.19
Hope: awareness has increased	.82	.07
Hope: trust in politicians	.81	.11
Hope: trust in environmental organization	.79	-.05
Hope: I can contribute	.77	-.12
Hope: focusing on positive news	.63	.02
Percent of variance explained	52.20	12.88

Note: Principal component analysis has been used as the extraction method, the rotation method is Varimax.

Altruistic values was measured with four items based on the well-validated Schwartz (1994) value survey and the 'Portrait value scale' version of this scale used in the European Social Survey:⁸ 'I think it is important that every person in the world should be treated equally'; 'It is important to me to listen and try to understand people who are different from me'; 'I want everyone to be treated justly, even people I don't know'; and 'I wish that all the world's people could live in peace and harmony.' Each item was followed by a 5-point scale ranging from 'does not apply at all' to 'applies exactly.' The Cronbach's alpha was .85.

Biospheric values was measured with four items based on the biospheric value scale created by de Groot and Steg (2008):⁹ 'I strongly believe that people should care for the environment'; 'It is important to me to adapt to and try to fit into nature'; 'I believe that it is important to respect nature'; and 'I believe that it is important to stop the pollution of our environment.' Each item was followed by a 5-point scale ranging from 'does not apply at all' to 'applies exactly.' The Cronbach's alpha was .86.

Social influence from parents was captured by two items (YeS 2009): 'Do your parents try to encourage you to become more aware of environmental issues?', and 'Have your parents tried to make you do more for the environment (recycling, saving energy, and so on)?' Answering the question 'How often does this happen?' the students rated each item on a 4-point scale (very seldom, sometimes, rather often, very often). The Cronbach's alpha was .80.

Social influence from peers was captured by two items (YeS 2009): 'Do your friends try to encourage you to become more aware of environmental issues?' and 'Have your friends tried to make you do more for the environment (recycling, saving energy, and so on)?' Answering the question 'How often does this happen?' the students rated each item on a 4-point scale (very seldom, sometimes, rather often, very often). The Cronbach's alpha was .77.

Reported pro-environmental behavior, the scale was developed from a pilot study where teenagers were asked to write what they themselves can do to help when it comes to climate change. In the present study the participants were asked to rate how often they do the following things out of environmental concern:¹⁰ 'help my parents to recycle packages,' 'buy environmentally friendly products,' 'bicycle or walk instead of being driven by car,' 'choose to take public transportation instead of being driven by car,' 'save water in the household (such as by not showering so long, not letting the tap run),' 'think about not buying unnecessary things that I do not really need,' 'turn off the light when leaving an empty room,' and 'turn off the TV and other home electronics with the circuit breaker not only the stand-by button.' Each item was assessed on a 5-point scale (almost never, seldom, sometimes, often, almost always). An aggregated measure of pro-environmental behavior was constructed from the mean of the eight ratings. The Cronbach's alpha of the scale was .81.

Subjective knowledge and interest about societal issues. Knowledge about global environmental problems was not measured directly in the questionnaire, however, knowledge/interest about societal issues in general was captured by three items about how often the young searched for information about societal issues. These items are revised questions from Livingstone and Markham (2008): 'You could describe me as a person who tries to keep myself informed about what is happening in the world'; 'It is my duty to know what is happening in the world'; and 'I try to keep myself informed about what is going on in the world by following the news.' Each item was followed by a 5-point scale ranging from 'does not apply at all' to 'applies exactly' and the Cronbach's alpha of the aggregated scale was .80.

The young adult sample

Participants and procedure

The purpose was to reach young adults between the ages of 20 and 30 years, who had moved from their childhood homes, to explore one specific form of pro-environmental behavior: household energy conservation. Since children are separated from their parents at the age of 16 in all official records in Sweden, the best sampling frame available was the registry of landline telephone accounts. The target group was restricted to young people who live in the Gothenburg area of Sweden.

A questionnaire was mailed to 772 persons. After two reminders, the first by telephone and the second by mail, 386 persons had answered the questionnaire giving a response rate of 50%. Five persons were excluded from the analysis: two because they still lived at home, three because they had not answered the survey in a serious manner. Thus, the following analyses are performed on 381 persons. The mean age of the respondents was 26.5 years ($SD = 2.5$). The sample contained 54.6% ($n = 208$) women, 45.1% ($n = 172$) men.¹¹ Of the respondents, 60.4% had some form of university education, 35.7% had a high-school degree, and finally 3.4% had their highest degree from nine-year compulsory school. Compared to the education level of this age group in the area as a whole, the respondents consisted of more people with a university education and fewer with only nine years of compulsory school.

Measures

Reported pro-environmental behavior: household energy conservation. The participants were asked how often they 'turn off the light when leaving an empty room,' 'think about not showering too long or too often,' 'save energy when preparing a hot meal,' 'turn off the TV and other home electronics with the circuit breaker not only the stand-by button,' 'pull out the mobile-phone charger from the wall socket,' 'buy and use energy saving light bulbs,' 'wash the laundry in lower temperatures (for instance 40 instead of 60 degrees centigrade),' 'lower the indoor temperature when you are on vacation.' Each item was assessed on a 5-point scale (almost never, seldom, sometimes, often, and almost always). A global measure of household energy conservation was derived from the mean of the eight ratings, and the Cronbach's alpha of the scale was .67, which is a bit low but still acceptable.

Hope concerning climate change was, for comparative purposes, assessed with the same items as when it comes to the teenage sample and the aggregated scale also consisted of the same seven items. The Cronbach's alpha of the scale was .77.

Altruistic values was in this case measured with three items concerning justice (social justice, correcting injustice, and care for the weak), equality (equality, equal opportunity for all), and peace (a world at peace, free of war and conflict) taken from Stern, Dietz, and Guagnano's (1998) brief inventory of values. In response to the question: 'How important are these values as guiding principles in your life?' respondents rated each value on a 5-point scale ranging from 'not important' to 'very important.' The Cronbach's alpha of the scale was .70.

Biospheric values was in this case measured with three items about living in unity with nature (unity with nature and fitting into nature), respecting nature (respecting the earth, living in harmony with other species), and protecting our environment (protecting the environment and preserving nature), taken from Stern, Dietz, and Guagnano's (1998) brief inventory of values. In response to the question:

'How important are these values as guiding principles in your life?' respondents rated each value on a 5-point scale ranging from 'not important' to 'very important.' The Cronbach's alpha of the scale was .77.

Social influence was measured with one item: 'Many people who are important to me think I ought to save energy in the household.' The item was followed by a 7-point scale ranging from 'does not apply at all' to 'applies very well.'

Subjective knowledge was measured with one item: 'I have good knowledge about how the energy I use in my household relates to different environmental problems.' The item was followed by a 7-point scale ranging from 'does not apply at all' to 'applies very well.'

Energy conservation in the childhood home was assessed by one item: 'In my childhood home one always thought about saving energy.' The item was followed by a 7-point scale ranging from 'does not apply at all' to 'applies very well.'

Results

Hope and reported pro-environmental behavior among the teenage sample

Correlation analyses were first conducted between, on the one hand, pro-environmental behavior and, on the other hand, the constructive hope measure, hope based on denial, biospheric values, altruistic values, social influence from friends, social influence from parents, knowledge/interest about societal issues, and age (see Table 2). All factors besides age had a significant relation to pro-environmental behavior. Hope based on denial had a negative relation to behavior while all the other factors were, as expected, positively correlated with pro-environmental behavior. That is, the more constructive hope, biospheric values and so on the young people possess, the more likely it is that they will behave environmentally friendly, while the opposite is true for hope based on denial. To determine what proportion of pro-environmental behavior that can be explained by each of these factors, independently of the others, they were then included in a multiple regression analysis with gender as a control variable.

As can be seen in Table 3, taken alone gender was a significant negative predictor; that is, girls were more likely to behave pro-environmentally than boys. However, this gender effect disappeared almost entirely when the other factors were included in the model. In step two of the model, the other control variables were entered and finally

Table 2. Pearson correlations in the teenage sample between, on the one hand, reported pro-environmental behavior, and, on the other hand, age, biospheric values, altruistic values, hope based on denial, constructive hope, knowledge, friends' influence, and parents' influence.

	Reported pro-environmental behavior
Age	.06 (n = 715)
Biospheric values	.51*** (n = 711)
Altruistic values	.41*** (n = 714)
Hope based on denial	-.11** (n = 711)
Constructive hope	.49*** (n = 704)
Knowledge/interest in societal issues	.39*** (n = 701)
Friends' influence	.35*** (n = 713)
Parents' influence	.45*** (n = 711)

*p ≤ .05; **p ≤ .01; ***p ≤ .001.

Table 3. Hierarchical multiple regression models predicting reported pro-environmental behavior among the teenagers.

	Reported pro-environmental behavior		
	Step 1 β	Step 2 β	Step 3 β
Gender (girl = 0; boy = 1)	-.22***	-.09**	-.07*
Biospheric values		.26***	.20***
Altruistic values		.14***	.12***
Friends' influence		.10**	.09**
Parents' influence		.24***	.21***
Knowledge		.16***	.14***
Hope based on denial		-.07*	-.08**
Constructive hope			.21***
R^2	.05***	.43***	.46***
ΔR^2		.38***	.03***

* $p \leq .05$; ** $p \leq .01$; *** $p \leq .001$.

in step three, constructive hope was inserted. In this final step all the included variables were independent significant predictors of pro-environmental behavior. Feeling a high degree of constructive hope does explain pro-environmental behavior when controlling for the more well-known factors. Hope was the strongest predictor together with parental influence. In addition, hope based on denial was a weak significant negative predictor. Biospheric values and altruistic values independently had an impact on environmentally friendly behavior, with biospheric values being the more important explanatory factor of the two. The proportion of variance accounted for by the full model was 46%, $F(8, 630) = 65.64$; $p < .001$.

Hope and reported energy conservation among the young adult sample

First, correlation analyses were conducted between, on the one hand, reported energy conservation and, on the other hand, the constructive hope measure, hope based on denial, biospheric values, altruistic values, energy saving in the childhood home, social influence, knowledge, age, and income¹² (see Table 4). All the factors besides age, income, and, surprisingly, social influence were significantly correlated

Table 4. Pearson correlations in the young adult sample between, on the one hand, energy saving, and, on the other hand, income, age, biospheric values, altruistic values, hope based on denial, constructive hope, knowledge, social influence, and habits in the childhood home.

	Reported energy conservation
Income	-.07 ($n = 363$)
Age	.01 ($n = 380$)
Biospheric values	.28*** ($n = 380$)
Altruistic values	.23*** ($n = 380$)
Hope based on denial	-.19*** ($n = 379$)
Constructive hope	.23*** ($n = 380$)
Subjective knowledge/interest	.25*** ($n = 378$)
Social influence	.08 ($n = 377$)
Habits in the childhood home	.16** ($n = 380$)

* $p \leq .05$; ** $p \leq .01$; *** $p \leq .001$.

Table 5. Hierarchical multiple regression models predicting reported energy conservation among the young adults.

	Reported energy conservation		
	Step 1 β	Step 2 β	Step 3 β
Gender (women = 0; men = 1)	-.22***	-.17***	-.16**
Biospheric values		.13*	.12*
Altruistic values		.09	.07
Knowledge		.22***	.21***
Habits childhood home		.12*	.12*
Hope based on denial		-.07	-.06
Constructive hope			.12*
R^2	.05***	.18***	.19***
ΔR^2		.13***	.01*

* $p \leq .05$; ** $p \leq .01$; *** $p \leq .001$.

to energy conservation. All these significant correlations, besides the one between energy conservation and hope based on denial, were positive. Hence, the more constructive hope, altruistic values and so on the young people possess the more likely it is that they will behave pro-environmentally.

In order to find out their independent contributions, these factors were then included in a hierarchical multiple regression analysis with gender as a control variable (see Table 5). In this case we can see that gender was an important predictor both alone and when the other variables were held constant. The young women were more inclined to save energy than the men. In the second step all the other variables except constructive hope were entered into the model. In this step feeling that you have a good understanding of how saving energy in the household is related to different environmental problems was the most potent explanatory factor followed by gender and biospheric values. In contrast to the results in the teenage sample, hope based on denial had no independent impact on energy saving. Finally, in the third step constructive hope was entered into the model. We can see that hope contributed uniquely to explaining pro-environmental behavior. Thus, hope had an effect on energy saving when controlling for more distal factors such as values, more proximal factors directly associated with the specific behavior, and hope based on denial. Constructive hope was the third most important predictor, together with biospheric values and energy habits in the childhood home. The final model accounted for 19% of the variance, $F(7, 350) = 12.06$; $p < .001$.

Discussion

The main questions addressed in this study were whether constructive hope concerning climate change – based on trust in other actors, trust in laypeople's effort, and positive re-appraisal – has a significant relation to pro-environmental behavior and has an impact on pro-environmental behavior when controlling for already well-known explanatory factors such as values, social influence, gender, and knowledge. These questions were investigated in two groups of young people: one of teenagers and one of young adults. The results show that hope is indeed more than just a feel-good emotion since it also seems to be important for environmental engagement among young people. It has a unique influence on pro-environmental

behavior and, therefore, a focus on, for instance, values in environmental education cannot replace a focus on hope.

This study, however, also indicates that it is important to distinguish between hope based on denial of climate change and hope based on more constructive forms of coping with this threat. When hope is based on denial it is not a positive phenomenon from the point of view of engagement, quite the contrary. Nevertheless, the study clearly shows that to automatically judge positive emotions, such as hope, as delusional and trivial, and as hindering people from taking climate change seriously is simply not correct. Instead, one could argue that positive emotions can facilitate engagement concerning climate change, i.e. problem-focused coping, by providing momentary respite from the harsh reality and giving people the strength needed to face the threat at hand and search for solutions (see Folkman 2008).

One positive way to evoke hope about climate change that was measured in this study is positive re-appraisal, containing the more specific sources of hope about focusing on positive news and a view that the awareness about climate change has increased. Studies about stress at a micro level have found that these forms of coping are not the same as denial, but are rather necessary and constructive forms of coping when the stressor, such as an illness, cannot be removed and solved at once (Folkman 2008; Folkman and Moskowitz 2000), as is also the case when it comes to global environmental problems (see Ojala 2007b). Positive re-appraisal is about perceiving the threat but being able to reverse one's perspective and also activate positive emotions that can help one to face the difficult situation and deal with worry constructively. The results of this study indicate that positive re-appraisal is also beneficial when it comes to coping with climate change, promoting an active stance toward the problems.

Another constructive source of hope is trust in other actors. This kind of hope is necessary since climate change cannot be solved by one person alone, but only at a collective level. This source of hope also seems to work as a motivational force, and, thus does not imply that one places all the responsibility for solving the problem on other actors. Hence, in the context of climate change, but also when it comes to other societal problems, it is important to extend the individualistic focus of Snyder's hope theory (Snyder 2000; Snyder, Rand, and Sigmon 2001) to also include collective dimensions (Courville and Piper 2004; McGeer 2004). Finally, that hope based on a belief that laypeople together can make a difference is positively related to pro-environmental behavior is perhaps not so surprising, but is still a novel finding.

Some limitations of this study should be mentioned. The cross-sectional design precludes any in-depth causal analyses. Hope can cause pro-environmental behavior, but earlier studies also indicate that pro-environmental behavior can strengthen feelings of hope concerning global environmental problems (Ojala 2007a; see also Gough 2002). To be able to explore which comes first, future studies should be of longitudinal or experimental designs. Thus, this is an explorative study and the results need to be replicated and extended in studies to come.

In the second study in this article social influence, knowledge, and energy conservation in the childhood home were captured with single-item measures. This is also the case when it comes to hope based on denial in both studies. Single-item measures are often seen as less reliable than scales containing multiple items. Therefore, for instance, the modest relations that were found between hope based on denial and pro-environmental behavior could perhaps be due to the use of only

one item to capture denial. However, for practical reasons (lack of space, response rate), single-item measures are sometimes used in published studies based on postal surveys (see, e.g. Göckeritz et al. 2010; Nolan et al. 2008), and research shows that they can be as accurate as multi-item scales (Wanous and Hudy 2001; Wanous, Reichers, and Hudy 1997). Nevertheless, in future studies it is important to include a multi-item scale measuring more facets of 'hope based on denial of the seriousness of climate change' since recent research has shown that 'climate skepticism' is a complex and multi-dimensional world-view (see for instance Poortinga et al. 2011).

Furthermore, the focus in this study is only on private-sphere pro-environmental engagement and in studies to come it would be interesting to look also at the relations between hope and more collective and political forms of environmental engagement (see Courtenay-Hall and Rogers 2002). Although, private-sphere environmental engagement does reflect social engagement, some researchers argue that it to a certain extent depoliticizes environmental problems and also preserve traditional gender roles, since women are often the ones responsible for buying ecological products and recycling (see Sandilands 1993).

The present study also has a number of strengths. The sample sizes in the two partial studies are quite large and the response rate in the teenage sample was good. But above all, this is the first study to show that hope about climate change, when controlling for hope based on denial, is positively related to pro-environmental engagement. Furthermore, this was found in two separate age-groups and with two different forms of pro-environmental behaviors, which increases the validity and generalizability of the results considerably. This study also complements earlier studies on how people deal psychologically with climate change by focusing on the promotion of a positive emotion (hope) instead of only concentrating on the regulation of negative emotions (see for instance Homburg, Stolberg, and Wagner 2007).

Finally, the study, together with the two qualitative studies mentioned in the introduction section (Ojala 2007a, 2008), have implications for education about sustainable development. The article started by describing how young people often experience a high degree of helplessness or even hopelessness when it comes to global problems such as climate change. Many young people seem to lack a 'good story' about the global future and are instead trapped in a discourse of threat and gloom (Reid, Payne, and Cutter-Mackenzie 2010). Education about sustainable development could be seen as a collective process where teachers and pupils/students together create a story about the future. What the present study indicates is that in this process concentrating on hope is one important aspect. This is not only in order to make young people feel good, but also to help them use their knowledge in a constructive manner and take an active stance concerning climate change.

In trying to co-create stories of hope concerning climate change, teachers could take as a starting-point the three main 'constructive' hope themes identified as important. Trust in one's own ability to make a difference shows the importance that one's own actions have for hope. In accordance with Snyder's (2000) hope theory it here becomes vital to identify optimistic but still realistic sub-goals concerning one's own engagement, and to identify and discuss pathways, i.e. different individual and collective pro-environmental behaviors that are effective in trying to reach the sub-goals. It is also important to encourage a feeling of agency – that everyone's effort is worth something – and to help the young to take satisfaction in small successes. When people start to do something concrete it seems as if hope is evoked by the actions themselves. Hope, in a sense, becomes embodied.

However, since the climate threat will not be solved directly just because a small group of people do something, to not only encourage critical thinking but also positive thinking, such as positive re-appraisal, could create a feeling of hope that can help the young to maintain their engagement. This process can be started by discussing young people's view of the global future. If it is very pessimistic, are there different ways of looking at it? Are there any positive trends to focus on? How has humanity solved large and seemingly uncontrollable problems historically? In moving beyond the popular media's apocalyptic images, one can also encourage young people to search for alternative stories about the future in, for instance, art and literature, stories that could be used as a base for critical and creative discussions (see Reid, Payne, and Cutter-Mackenzie 2010). Teachers should also be aware of hope based on denial-like patterns of thinking. It is important to encourage young people to put words to them so that these ideas can be discussed critically in the classroom. Otherwise, it will be very hard to reach out to the young people who hold them with facts and ethical arguments.

Finally, having trust in different societal actors also seems to be an important part of feeling hopeful concerning climate change and here teachers can help their students in different ways. One can of course argue that teachers should not encourage naïve and uncritical trust; however, it is important to try to avoid extreme cynicism concerning, for example, politicians, and scientists, since this often leads to feelings of helplessness (see Colby et al. 2007, 153). Colby and colleagues emphasize that it is important to help young people in their late teens and early adulthood to develop a more nuanced understanding of the complexity and dilemmas that these actors face; that it is difficult to achieve change, but that many are doing their best. To connect the young with societal actors that have worked with the climate issue for a long time and who have shown persistence in the face of challenge could also be a strategy (see Colby et al. 2007, 154).

It is important to help young people to face the climate problem and bear the negative emotions related to it. In this article it has, however, been emphasized that in this process one also needs to encourage young people to see positive aspects that can activate hope, a feeling that can transform worry into a constructive motivational force (see Ojala 2007b). Thus, hope about climate change is more than an illusion or a solace; it could also be an important path to engagement.

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Notes

1. In this article the word 'behavior' is used more or less synonymously with 'action' and 'engagement', i.e. the word 'behavior' does not imply action without thinking in a behaviorist sense. Rather, it serves to describe the many different things that people do

- in their everyday life to try to help in climate change issues. The aim is to explore whether certain ways of thinking and understanding (sources of hope) co-vary with engagement concerning climate change. For critical comments about emphasizing behavior over thinking see Courtenay-Hall and Rogers (2002) and Gough (2002).
2. In this study worry was defined as cognitive ruminations about uncertain future negative events, accompanied by an anxiety-like negative affect.
 3. There are researchers who emphasize that hope in a theoretical sense is not the same as optimism, which is a concept much more related to uncritical certainty, and also sometimes to unrealistic goal setting (McGreer 2004; Snyder et al. 2001, 2002). A study performed in different countries has shown that optimism about the future among teenagers is actually negatively related to their school performance in environmental science (OECD 2009). For a study on unrealistic optimism in an environmental context, see Pahl et al. (2005).
 4. Or cognitive restructuring.
 5. Four persons did not answer the question about school-level.
 6. Three persons did not answer the question about gender.
 7. Pilot studies where young people of different age-groups have been asked about what give them hope concerning climate change indicate that denial of the seriousness of the problem is one way to activate hope.
 8. For more information about the theoretical structure, validity, and reliability of this scale, see Schwartz (2003).
 9. This scale is partly based on items from Stern, Dietz, and Guagnano (1998) and Schwartz (1994). In this study it has been transformed into 'I' form to fit with the wording of the altruistic values scale and the age-group in focus. For the original scale see pages 16–7 in this article.
 10. Even though most published studies about pro-environmental behavior use self-report measures and although some studies show that self-reported pro-environmental behavior have a satisfactory correspondence with actual behavior (Gamba & Oskamp 1994; Warriner, McDougall, & Claxton 1984), one should be aware that social-desirability could cause self-reported behavior to be slightly overrated compared to actual behavior.
 11. One person classified himself/herself as both male and female.
 12. Reported income of the household was included here since this factor could possibly be related to energy use.

Notes on contributor

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