Graduate thesis

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Norwegian University of Science and Technology
Faculty of Social and Educational Sciences
Department of Psychology

Jakob Saur

Certain Uncertainties

A Qualitative Study of Climate Change Risk Perception Among Norwegian University Students

Graduate thesis in Profesjonsstudiet i psykologi
Supervisor: Britt-Marie Drottz Sjöberg
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Forord

Klimaendringer er et tema som har interessert meg i lengre tid, både som privatperson og fra et faglig ståsted. Som snart ferdig utdannet psykolog er det uhyre spennende å utforske et tema som berører så mange sider av menneskets psykologi—alt fra hvordan vi samarbeider med hverandre, til hvordan vi opplever risiko eller motiveres til handling, og mye mer. Samtidig er det et fenomen som har fått en stadig større plass i mediedekningen og den offentlige samtalen, og som dermed har blitt en økende del av hva folk tenker på og bekymrer seg for, noe som gjenspeiles i fremveksten av begreper som 'klimaangst' og 'flyskam'. Derfor har det vært givende for meg å få muligheten til å utforske dette fenomenet nærmere gjennom arbeidet med denne oppgaven.

Denne oppgaven hadde ikke blitt til uten god hjelp fra verdifulle støttespillere. Tusen takk til min veileder, Britt-Marie Drottz Sjöberg, for dine grundige tilbakemeldinger, din tålmodighet, og gode diskusjoner underveis i prosjektet. Takk til min medstudent Jørgen Storli Værnes som hjalp til med kodingen av datamaterialet. Takk til gutta på datasalen for både gode diskusjoner og god avveksling. Hjertelig takk til min familie for støtten på veien. Sist, men ikke minst, en stor takk til alle deltakerne som deltok i prosjektet og delte sine erfaringer. Det hadde ikke blitt noen oppgave uten dere.

Jakob Saur

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Abstract

The aim of this study is to explore Norwegian students' perception of the risks associated with climate change. In recent years, the issue of climate change has received a lot of media attention and has become an increasing part of the public conversation, with several youth uprisings and protests having taken place across the globe in recent years. In light of this, this study wanted to explore how students in Norway perceive the risks of climate change and how they view their own ability to influence and mitigate the issue. The study was done within a qualitative research framework. Fifteen semi-structured interviews were carried out with university students, with six of the respondents being recruited from the Campus for Natural Sciences and Technology and nine respondents from the Campus for Social Sciences and Humanities. The interviews were consequently transcribed and analyzed using thematic analysis. The results showed that the findings could be categorized into the following main themes in the three parts of the interview. The main themes of part 1 were: 1) Risk aspects, 2) Salience, 3) Personal stance, 4) Social context and 5) Actions. The main themes of part 2 were: 1) Actions and 2) Social context. The main themes of part 3 were: 1) Media and 2) Social context. Various sub-themes belonging to these main themes were categorized. The results suggested that the respondents viewed climate change as a salient, important and urgent issue. However, many reported feeling personally safe and emphasized societal and global risks of climate change more than personal risks. The respondents reported feeling a lot of uncertainty about the issue, especially concerning how they could mitigate the issue and regarding the efficacy of mitigation behaviors.

Sammendrag

Formålet med denne studien var å undersøke norske studenters opplevelse av risiko forbundet med globale klimaendringer. Mediedekningen av klimaendringer har de siste årene vært omfattende og det har blitt en stadig større del av den offentlige samtalen. Mange steder rundt om i verden har det funnet sted ungdomsopprør og protester. I lys av dette ønsket denne studien å utforske hvordan studenter i Norge opplever risikoene ved klimaendringer og hvordan de vurderer sin egen evne til å påvirke og minke problemet. Studien ble gjennomført innen et kvalitativt rammeverk. Femten semistrukturerte intervjuer ble gjennomført med universitetsstudenter fra NTNU, hvorav seks av informantene ble rekruttert for campus for naturvitenskap og teknologi og ni av informantene fra campus for samfunnsvitenskap og humaniora. Intervjuene ble deretter transkribert og analysert ved hjelp av tematisk analyse. Resultatene viste at funnene kunne kategoriseres i følgende hovedtema for de tre delene av intervjuet. Hovedtemaene i del 1 var: 1) Risikoaspekter, 2) Fremtredenhet (Salience), 3) Personlig ståsted, 4) Sosial kontekst og 5) Handlinger. Hovedtemaene for del 2 var: 1) Handlinger og 2) Sosial kontekst. Hovedtemaene for del 3 var: 1) Media og 2) Sosial kontekst. Innenfor disse overordnede temaene ble ulike undertemaer kategorisert. Resultatene tyder på at informantene anså klimaendringer som et fremtredende, viktig og presserende fenomen. Likevel beskrev mange at de følte seg trygge på et personlig nivå, og vektla samfunnsmessig og global risiko knyttet til klimaendringer, fremfor personlige risiko. Informantene rapporterte at de opplevde mye usikkerhet forbundet med saken, særlig knyttet til hvordan de kunne bidra til å minke problemet og hvorvidt individuelle klimatiltak kunne ha en meningsfull effekt.

Introduction

The background for this study was a desire to learn more about how the issue of climate change is perceived by young people in Norway today. Over the previous years, the climate issue has received widespread media coverage, and young people have become important voices in the debate surrounding the issue. On 15 March 2019, tens of thousands of school students marched in more than 100 countries to protest governments' inaction, carrying signs with messages such as "Don't burn our future" (*News at a glance*, 2019). In Norway, 40,000 students participated in the March protests (Hagen & Staude, 2019). The protests were largely motivated by Greta Thunberg of Sweden, who led a series of weekly school strikes named FridaysforFuture since August 2018. These youth protests have been met with support from a number of adult scientists (Science, 2019). In Norway, the word "klimabrøl" (which directly translates to "climate roar" in English) was announced as the new word of the year in 2019 by the Language Council of Norway (Hagen & Staude, 2019). Similarly, "climate strike" was announced as 2019's word of the year by Collins Dictionary (Hanson, 2019). In light of this increased media focus and the widespread youth engagement, I wanted to explore how young people in Norway feel about the issue. How do they perceive the potential risks and consequences of climate change? How do they view their own ability to affect and mitigate the issue? How do they perceive the way climate change is discussed in the public conversation? Appreciating that climate change represents an urgent and growing threat to humanity, psychology has an important role to play in gaining insights about people's thoughts, behaviors and attitudes relating to the issue (Van Lange et al., 2018).

The Threat of Climate Change

Climate change has been described as a major threat to human flourishing and has received a lot of attention from researchers across a variety of fields (Montgomery, 2009). For some time, there has been a strong consensus in the scientific community that climate change is real, and that human behavior is causing it (Cook et al., 2016). According to the Intergovernmental Panel on Climate Change's (IPCC) 2018 report on the impacts of 1.5˚C global warming on natural and human systems, the consequences of human-driven climate change are wide-ranging and severe, both presently and in terms of future consequences (IPCC, 2018). Human activities are estimated to have already caused approximately 1.0˚C of warming, with a *likely* range of 0.8˚C to 1.2˚C. The IPCC concludes

that it has high confidence that these changes have already had impacts on organisms and ecosystems, as well as on human systems and well-being. The changes already observed include consequences such as:

> "[I]ncreases in both land and ocean temperatures, as well as more frequent heatwaves in most land regions (high confidence). There is also high confidence that global warming has resulted in an increase in the frequency and duration of marine heatwaves. Further, there is substantial evidence that human-induced global warming has led to an increase in the frequency, intensity and/or amount of heavy precipitation events at the global scale (medium confidence), as well as an increased risk of drought in the Mediterranean region (medium confidence)." (Hoegh-Guldberg et al., 2018, p. 177).

A report on the global impact of climate change, published by the Global Humanitarian Forum in 2009, concluded that climate change is responsible for 300,000 deaths annually and about $125 billion in economic losses per year. Poor and low-income communities around the world have a much higher vulnerability to these risks (Global Humanitarian Forum, 2009). As Montgomery (2009) argues, the health consequences of climate change would likely be severe. This includes increased deaths and injury due to heatwaves, floods, storms, fires, and droughts. Furthermore, the incidence of cardiorespiratory and vector-borne diseases is expected to increase. Water shortages have been predicted to affect 250 million people in Africa and in excess of 1 billion in Asia by 2050, and mass migration has also been predicted (Montgomery, 2009). Likewise, a Lancet/University College London Commission on the global health effects of climate change reported that "[e]ffects of climate change on health will affect most populations in the next decades and put the lives and wellbeing of billions of people at increased risk" (p. 1693), leading the authors to conclude that climate change is "is potentially the biggest global health threat in the 21st century" (p. 1728).

If temperatures continue to increase at the current rate, global warming is likely to reach 1.5˚C between 2030 and 2052. The official goal of the United Nations is to limit the global warming to below 1.5˚C. A warming above this threshold would entail increased risks and negative consequences within several domains, with the extent of the predicted consequences varying based on the extent of warming and other variables. These consequences include increased frequency of extreme weather, loss of biodiversity and

disruptions of both terrestrial and marine ecosystems, and large-scale human costs (IPCC, 2018).

However, despite these current negative consequences and future risks, scientists have argued that humans also possess the capacity to mitigate the problem. Most of the increase in global temperature has been attributed to human activities, especially greenhouse gas emissions from fossil fuel combustion and industrial processes (Blanco et al., 2014; Lundqvist & Biel, 2007), factors that are under human influence. Adaptation and mitigation are already occurring, and according to the IPCC, future climate-related risks would be reduced substantially by the implementation and acceleration of far-reaching, cross-sectoral climate mitigation and adaptation (IPCC, 2018). In this respect, psychology has a central role to play in terms of gaining and contributing knowledge concerning how human behavior and thought processes relate to climate change.

Climate Change and the Role of Psychology

The factors that drive humans' contribution to climate change are multifaceted and complex, and the same will necessarily be true of solutions to the problem. Per capita production and consumption growth are major drivers of increasing greenhouse gas emissions, and a lot depends on the energy intensities of nations' economies. Infrastructural choices and political decisions play central roles (Blanco et al., 2014). However, while many of the adaptations to climate change will have to be structural in nature, the IPCC also emphasizes that individual behavior, lifestyle and cultural changes are important tools for mitigation in some areas. Consumer choices with regard to food, mobility and housing and consumption patterns in general have substantial effects on greenhouse gas emissions. Such consumption patterns are not only determined by economic forces, but "also by technological, political, cultural, psychological, and environmental factors" (Blanco et al., 2014, p. 387–388). And beyond individual consumer choices, the political and infrastructural choices of a society are dependent upon the values and attitudes of a society. As such, the values and behaviors of people play instrumental roles in shaping political adaptation to the issue. As Lundqvist and Biel (2007) argue, environmental values are important in shaping people's willingness to accept climate change policy measures, and values and norms are necessary for creating climate policy support. Considering that human behavior is central to both the causes and solutions to climate change, an obvious question is whether psychological science can provide insights and solutions to climate change (Van Lange et al., 2018).

Climate Change as a Public Concern

Population surveys support the notion that climate change is a growing concern for the general population in Europe. In the European Commission's regular reports on public opinion in the European Union (EU), citizens are polled about their main concerns—concerns for their personal lives, national concerns and concerns facing the EU. In the short span between the autumn 2018 report and the spring 2019 report, climate change and environmental issues have seen a clear upswing in terms of the number of people who consider it their main concern—on a personal level, a national level and the level of the EU (European Commission, 2018, 2019). The biggest change has been in the ranking of the issues that Europeans consider the most important issues that the EU is currently facing. Climate change went from being ranked the fifth most mentioned issue in autumn 2018 to the second most mentioned issue in spring 2019: mentioned by 22 percent, an increase of 6 percent. This puts the issue of climate change ahead of the economic situation in the rankings and only behind immigration. When asked about national concerns, the environment, climate change and energy issues topped the agenda in five EU Member States in spring 2019 compared to just one in autumn 2018: Denmark (mentioned by 54% of respondents), the Netherlands (51%), Sweden (44%), Germany (36%) and Austria (26%). Norway, not being an EU member, is not among the surveyed countries. A broad increase has also been seen in the number of people who report climate change and environmental issues as a personal concern (European Commission, 2018, 2019).

The number of respondents mentioning climate change and the environment as a concern appears to be generally higher in northern and central Europe, with countries like Denmark, the Netherlands, Sweden and Germany ranking high across the various domains of concern. One possible explanation for this might be that it is easier for people in economically stable countries to list climate change as a main concern, whereas in countries facing greater economic difficulties, the issue of climate change might be overshadowed by issues that are perceived as more immediate. This correlation between environmental concern and national wealth has been supported in the literature (Franzen & Vogl, 2013). However, Lo and Chow (2015), who analyzed surveys from 33 countries to explore the relationship between perceptions of climate change and national wealth, found a more paradoxical relationship. Citizens of wealthy countries did indeed tend to see climate change as a more important issue. However, despite this, they were also less likely to rank it as a highly dangerous threat. This led the authors to conclude that adequate economic resources provide

people a sense of collective security, which may eventually lead to a lack of adaptation to climate change.

When it comes to opinion polling in Norway, findings similarly suggest that there is a widespread acceptance that climate change is happening and that it represents a concern for many people. A 2018 survey by the Center for International Climate and Environmental Research Oslo (CICERO) found that 80 percent of respondents think that climate change is happening, while 16 percent remain unsure and 4 percent believe it is not happening. Respondents in the age group 18–29 report being the most worried by climate change, further strengthening the assumption that climate change is an especially salient concern for younger people. Furthermore, young Norwegians are more inclined to report that they feel a personal responsibility for reducing greenhouse gas emissions and are more willing to support policies targeting climate change (Mørtvedt et al., 2019). Other international polling points in a similar direction. A 2015 Pew Research Center survey of 40 countries found that majorities in all the polled nations considered climate change to be a serious problem, with a global median of 54 percent considering it to be a *very* serious problem. Furthermore, a median of 78 percent support the idea of their country limiting greenhouse gas emissions to meet international agreements (Pew Research Center, 2015). Based on these studies, it seems fairly straightforward to conclude that young people are concerned about climate change.

Structure of the Thesis

In the upcoming section I will discuss the theoretical frameworks that have informed this study. Previous work on the subject of risk psychology and climate change will be discussed. Some social psychological models that have been developed to explain how people cope and make decisions when faced with risks will also be described. The method section will describe the methodological choices that were made during this study, including the design, data collection and method of analysis. The result section will provide the results of the analyses, and a description of these results. The discussion section will review the implications of the results, offer interpretations of the results and view them in light of relevant literature, and consider the methodological limitations of the study and recommendations for future research. The conclusion will summarize the results of the study.

Theory

Risk Perception and Barriers to Climate Change Mitigation

For some time scholars have noted that there has been a lack of public engagement around the issue of climate change, which is at odds with the seriousness of the issue (Gifford, 2011; Norgaard, 2011; Spence et al., 2012). While the recent years have seen notable youth uprisings, researchers have noted that large parts of the populations around the world remain disengaged or in a state of inaction. If there has been a wide public acceptance for some time that climate change is happening, in Norway and elsewhere, then some questions become apparent: why has this awareness not translated into social action sooner? Why has there not been more public pressure on politicians to tackle the issue? Why do some social and environmental problems result in popular uprisings when others do not? As Norgaard (2011) puts it, “[d]espite the extreme seriousness of this global environmental problem, the pattern of meager public response—in terms of social movement activity, behavioral changes, and public pressure on governments—exists worldwide” (p. Xviii).

One line of research has proposed that this absence of public response has been caused by a lack of information—people either do not know enough about the issue, the climate science is too complicated to understand for the wider public, or they have been misled by misinformation campaigns. The common thread is that information is the limiting factor for public engagement with climate change. This view has been called the *information deficit model*. As Bulkeley (2000) states, this model predicts that "the public needs to be given more knowledge about environmental issues in order to ensure that they take action" (p. 316).

However, the assumptions of the information deficit model have been challenged. One curious fact has been observed when it comes to the relationship between people's knowledge about climate change and their concern regarding the issue. A series of biannual surveys found a significant downward trend in Norwegians' environmental concerns and worry between 1989 and 2001 (Hellevik, 2002), despite the fact that knowledge concerning climate change grew substantially in this period. According to the author, this "decline from such a high level of anxiety is to be expected. There are limits to how long it is possible for individuals to live with the extremely pessimistic environmental perspectives" that were reflected in the earlier surveys (p. 13). Later findings from an American sample point in the

same direction: Kellstedt et al. (2008) found that respondents that were more informed about climate change felt *less* personal responsibility for the issue and were less concerned about it. Therefore, there is reason to doubt that a lack of public response to the issue of climate change can be explained by dearth of information. However, there is one caveat regarding the findings of Kellstedt et al. (2008), namely that they used self-report to measure how informed the respondents considered themselves. It is possible that objective measures of informedness would have yielded different results. Nevertheless, taken together, the findings of Hellevik (2002) and Kellstedt et al. (2008) do suggest that the information deficit model cannot fully explain the apparent gap between knowledge and engagement surrounding climate change. If it is not merely a lack of information that keeps people from responding to the risk of climate change, then an obvious question is what other factors hinder engagement or cause inaction.

Research on the risk perception of climate change has identified some potential psychological barriers that hinder adaptive behavior or limit how serious we consider the issue to be. One line of research has focused on what has been labeled the *psychological distance* of climate change. According to Spence et al. (2012), climate change tends to be perceived as a distant threat on a number of different dimensions, at least in Western countries. It is viewed as distant in terms of time, in the sense that people expect the negative effects to occur at some unknown time in the future. It is also viewed as distant in terms of its social impact, mostly harming dissimilar rather than similar others, such as people in poorer nations than our own. It is also often seen as geographically distant, mostly affecting people in faraway places. As some researchers have argued (Brügger et al., 2015; Gifford, 2011), this perception of climate change as a distant threat is problematic because it makes it appear to be an issue of little personal relevance, which in turn is problematic since the perception of being personally at risk can be an important motivation for taking action to reduce the risk in question. In the experiments of Spence et al. (2012), they found that a greater feeling of psychological distance was related to a lower degree of climate change concern and vice versa, suggesting that this phenomenon might be of importance when it comes to climate change communication and motivating adaptive behavior. However, studies of interventions aimed at reducing the psychological distance of climate change and making it appear more proximal have yielded mixed results (see e.g., Schuldt et al., 2018), in some cases bringing about positive effects (increased motivation for adaptive behavior), sometimes no visible effect, and in some cases backfiring (decreasing mitigation motivation). This has led some researchers to conclude that the effects of making climate change seem more proximal is "much more complex than is commonly assumed" (Brügge et al., 2015, p. 1031).

Spence et al. (2012) argue that uncertainty is another factor that may contribute to a sense of psychological distance from climate change. Gifford (2011) similarly points to uncertainty as a possible barrier to climate change mitigation. As he points out, real or perceived uncertainty tends to reduce the frequency of pro-environmental behavior, a phenomenon that has also been illustrated in experimental research on resource dilemmas (de Kwaadsteniet, 2007). When it comes to climate change, Gifford argues, uncertainty may function as a justification for inaction or postponed action. Uncertainty is also necessarily a central feature when it comes to climate change, such as concerning the precise nature of the potential impacts of climate change. As Spence et al. (2012) point out, "[c]limate systems, as well as the human and biological systems with which climate systems interact, are extremely complex and our understanding of how these systems operate is incomplete" (p. 960), and this makes uncertainty an inherent, central feature of the issue. Furthermore, uncertainty is also a central part of how climate change is communicated by scientists to the public. The IPCC has communicated uncertainty regarding the consequences of climate change by using a set of probability terms (such as 'likely' or 'very likely') accompanied by interpretation guidelines. Budescu et al., (2009) conducted an experiment in which subjects read sentences from the 2007 IPCC report and were asked to assign numerical values to the probability terms. They found that the respondents' judgment deviated significantly from the IPCC guidelines, and that this was the case even when they had access to these guidelines. This, according to the authors, leads many to interpret probabilities as less extreme than intended by scientists, "which may lead to underestimation of the problems being discussed" (p. 306). If there are significant psychological barriers that limit climate change mitigation, this raises the question of which factors may predict the willingness to engage in adaptive behavior. Below, some notable social psychology models of risk and behavior change will be described.

Social Psychological Theories of Risk and Behavior Change

As pointed out above, climate change is an increasingly pressing issue for societies and policymakers across the globe. Scientists have been warning us about the risks involved in climate change for some time (Cook et al., 2016; IPCC, 2018), and these risks have also been the focus of much media coverage (Stoknes, 2015). However, climate change is not a simple, straightforward risk, but has consequences that are stretched out across time and space, with a great amount of uncertainty involved. Pidgeon (2012) points out that in contrast to the “certainty of the core science message about climate change is the fact that this issue

also involves complex layers of risk and uncertainty" (p. 952). Given the complexity of the issue, some central questions for the field of psychology are: How do people deal with messages about the potential risks of climate change? How should we understand people's willingness or unwillingness to engage in protective and mitigating behaviors to try to reduce the risk of climate change? Several psychological models have been developed over the years to understand, or to predict, people's reactions to various risks, and these models have also been applied to environmental risks. In the context of bushfire safety research, Beatson and McLennan (2011) described four of the more notable models of risk perception and behavior change, namely theory of planned behavior (TPB), extended protection motivation theory (EPMT), extended parallel processing model (EPPM) and terror management health model (TMHM). These models were used as sources of inspiration in the development of the interview guide of my study, for the reason that they specify various factors that are thought to be important for predicting people's willingness to change behavior as a response to risk, which was an important aspect of what I wanted to explore in the interviews in this study. Because of this, these four models will be described briefly below.

Theory of planned behavior posits that the immediate determinants of behavior are behavioral intentions, and these intentions can according to the theory in turn "be predicted with high accuracy from attitudes toward the behavior, subjective norms, and perceived behavioral control" (Ajzen, 1991, p. 179). Attitudes, subjective norms and perceived behavioral control are in turn determined by underlying beliefs and other variables. Attitude here means the extent to which a person has a favorable or unfavorable appraisal of the behavior in question. Subjective norms refers to the extent to which the person perceives that there is a social pressure to perform or not perform the behavior in question. In the context of climate change mitigation, normative beliefs could concern the perceived social pressure to carry out various climate-friendly behaviors. Perceived behavioral control refers to how easy or difficult it is to perform the action in question, and this is thought to be shaped by past experience and anticipated obstacles (Ajzen, 1991). An important feature of TPB is that it predicts that perceived behavioral control influences behaviors directly, but also indirectly through intentions. Attitudes are shaped by behavioral beliefs, which are seen as the product of outcome beliefs and outcome evaluations, which refer to the perceived likelihood that a particular behavior will lead to a given outcome and whether that outcome is desirable (Betason & McLennan, 2011). When applied in the context of climate change, TPB would imply that attitudes favorable to climate change mitigation behaviors, social norms suggesting that important others desire these mitigation behaviors, and perceived behavioral

control over the climate change mitigation behaviors are the main predictors of intentions to engage in such mitigation behaviors.

Extended protection motivation theory (EPMT) is based on components from Becker's health belief model and Bandura's social learning theory (Rogers et al., 1983). The theory holds that both adaptive and maladaptive responses to a threat result from two processes: threat appraisal and coping appraisal. Threat appraisal refers to perceptions of the severity of the threat and personal vulnerability, whereas coping appraisal refers to the belief that the recommended behaviors are effective and the belief in your personal capacity to carry out these recommended behaviors. When both threat appraisal and coping appraisal are high, EPMT posits that adaptive behaviors should increase and maladaptive behaviors should decrease (Beatson & McLennan, 2011; Rogers et al., 1983). In other words, if we believe that a threat is serious and that we are personally vulnerable to the threat, and we also believe that we have the capacity to effectively mitigate the threat, then we ought to be likely to respond in an adaptive fashion. The theory also considers potential rewards of engaging in maladaptive behaviors, which can involve things such as social inclusion, or saving time or money. In the model, coping appraisal is made up of the costs of adaptive responses and two efficacy components: response efficacy and self-efficacy. Response efficacy refers to the extent a person believes that the recommended behaviors will be effective in reducing the threat. In the context of climate change, this can mean that a person believes that traveling less by plane or using their bike instead of driving a car will have a meaningful effect on the environment. Self-efficacy refers to one's belief that one has the ability to successfully carry out the recommended actions (Beatson & McLennan, 2011). An assumption of EPMT is that intentions precede behavior. The model sees these intentions as the protection motivation, and these intentions are decided by the coping and threat appraisal processes. According to Rogers et al. (1983), EPMT posits six conditions that are required for creating protection motivation and coping behavior:

> "An individual must believe that (1) the threat is severe (2) he or she is vulnerable (3) he or she can perform the coping response (4) the coping response is effective (5) the rewards associated with the maladaptive response are outweighed by the factors decreasing the probability of making the maladaptive response, and (6) the costs of the adaptive response are outweighed by the factors increasing the probability of making the adaptive response" (p. 171).

According to Witte (1992), EPMT fails to fully explain the fear control processes that lead people to reject behavior change messages. He argued that responses such as avoidance, denial, fatalism, wishful thinking and hopelessness can lead to this type of maladaptive fear control. Witte therefore used elements of EPMT to develop the extended parallel processing model (EPPM), which aims to explain how threat appraisal and coping appraisal processes interact to influence protective or defensive motivation. According to EPPM, when the threat is perceived to be high, this causes fear and motivates us to evaluate the efficacy of coping behavior. Conversely, if the threat is perceived to be low, there is no motivation to engage in this type of efficacy evaluation. If both the threat and efficacy are perceived to be high, then people will initiate danger-control processes, meaning coping behaviors. However, in cases where efficacy (the ability to deal with the problem) is perceived to be low, high perceived threat will exacerbate fear, which will increase defensive motivation and initiate the fear-control processes described above, such as avoidance, denial or fatalism (Beatson & McLennan, 2011). In other words, fear of a threat will only lead to adaptive behavior if the person also feels that they have the ability to successfully cope with the threat. As Witte (1992) puts it, "perceived threat determines the degree or intensity of the reaction to the message, while perceived efficacy determines the nature of the reaction" (p. 338). In the context of climate change, EPPM would predict that if a person perceives climate change to be a grave threat but does not feel they have a successful way of mitigating the issue, they might resort to maladaptive fear-control processes. The person might engage in hopelessness or fatalism, convincing themselves that the negative consequences of climate change are inevitable, no matter what we do; they might engage in avoidance, avoiding reading news stories concerning the issue and other reminders; or they might engage in denial, convincing themselves that climate change is perhaps not a serious threat after all. Both the EPMT model and the EPPM model have been criticized for failing to account for the possible role of social environmental factors (Beatson & McLennan, 2011).

Goldenberg and Arndt (2008) have argued that psychological health models have tended to focus on two broad categories of motivation, namely health-oriented motivations and self-oriented motivations. The traditional health models assume that people are motivated by the desire to protect their health. However, as Goldenberg and Arndt (2008) note, people often act according to other, self-oriented motives that can result in behaviors that are detrimental to your health, such as engaging in excessive tanning in order to pursue beauty ideals or smoking in order to pursue social inclusion. In developing the terror management health model (TMHM), they attempted to incorporate these conflicting health-oriented and

self-oriented motives into a unified framework based on terror management theory. According to this theory, people's awareness of the inevitability of death combined with an instinctive desire for self-preservation creates the potential for debilitating anxiety, or terror. To avoid experiencing maladaptive levels of this kind of terror or anxiety, the theory proposes that people engage in a variety of defense mechanisms. The theory proposes two sets of defense mechanisms, namely proximal and distal defenses. Proximal defenses are direct attempts to remove thoughts concerning death from current attention, for instance through attempting to suppress thoughts of death. Proximal defenses are engaged immediately when people are explicitly reminded of their own vulnerability to death. In contrast, distal defenses happen sometime after the reminder of death, when the thoughts of mortality are activated but not conscious. According to the theory, the two main psychological structures that serve terror management through distal defense mechanisms are the cultural worldview and self-esteem. Cultural worldview can mean identification with cultural beliefs and ideologies, which can afford a sense of symbolic immortality since these beliefs and ideologies extend through space and time beyond the physical death of the individual. Self-esteem refers to the extent to which a person lives up to the standards of value contained within the cultural worldview. The theory posits that when mortality reminders are activated but non-conscious, people are motivated to act in ways that defend the integrity of their worldview and self-esteem. According to TMHM, health-oriented motivations activate proximal defenses that remove conscious thoughts of death associated with the relevant threat, whereas self-oriented motivations simulate distal defenses, which leads to behaviors that protect the person's self-esteem and worldview, even if this comes at the expense of their health (Beatson & McLennan, 2011).

In the context of climate change, TMHM would predict that climate-change-related reminders of mortality can either lead people to deny their vulnerability to climate change, convincing themselves that they are not personally at risk, or it could increase intentions to engage in behaviors that mitigate perceived vulnerability, such as engaging in climate change mitigation behaviors. Safety-promoting behaviors are more likely to occur as a response to messages that explicitly warn of the potentially fatal consequences of maladaptive behavior, that presents compelling evidence for the efficacy of the recommended behaviors, and that promotes optimism about the outcomes of one's risk assessment (Beatson & McLennan, 2011).

Method

This part of the thesis will outline the thesis objective, study design and inclusion criteria, development of the interview guide, ethical considerations, data collection, and choices of methodology regarding data analysis.

Thesis Objective and Approach

The main aim of this study is to elucidate the following main research question: how do students perceive the risks associated with climate change? It was also of interest to investigate how they perceive their own capability to ameliorate the problem, and how they experience the way the issue is communicated in the public conversation. To illuminate these questions it was decided to collect data about students' thoughts concerning the risks and consequences of climate change. This was done by carrying out interviews with students at the Norwegian University of Science and Technology. A qualitative approach was chosen to explore the central research question. Such a method was chosen with the aim of gaining detailed descriptions of the students' own experiences concerning the subject matter. This study is not meant to test hypotheses but is an exploratory approach with the aim of gaining further information concerning young adults' perceptions of climate change. A qualitative study design presents the opportunity to explore and get access to rich information concerning how the participants experience their life situation and collect their viewpoints and perspectives concerning the topic at hand (Thagaard, 2018), in this case climate change. Semi-structured interviews were chosen as the most suitable method for obtaining data, as this method allows the participants to freely formulate their own responses, while also providing the opportunity for follow-up questions and further elaboration of answers in cases where that is desirable. The condition that the participants will not be personally identifiable in the report also allows for the participants to provide honest and open answers without fear of being identified in the published material.

Design

The main inclusion criterion for selecting participants was that they should be students at NTNU. Students belong to the cohort that will live to experience the effects of climate change, and NTNU attracts students from many parts of Norway. It was also decided to recruit half of the participants from NTNU's campus for social sciences and humanities and the other half from the campus for natural science and technology, with a goal of recruiting 12 participants in total. Although the sample is small and non-random and the results cannot

be generalized, it is assumed that the expected richness of qualitative data will provide valuable information. Because of the small sample size, and because of the non-generalizable nature of qualitative methods, this study could not be expected to yield findings about generalizable differences between the two sets of participants. The design included participants from the two different campuses to ensure that a broader range of views would be collected, leading to richer information, which is a central goal of qualitative research (Thagaard, 2018).

Interview Guide

A semi-structured interview guide was developed in advance of the recruitment of participants. A series of questions were formulated based on the main aim of the study, namely to investigate the participants' perceptions regarding risks related to climate change. The interview guide was divided into three overarching sections, with each section containing a set of questions related to each other. The selection of questions and the three overarching topics of the interview guide were inspired and informed by the social psychological theories of health promotion and injury prevention described by Beatson and McLennan (2011), which is presented in the theory section. However, the structure of the interview guide did not follow any of these models in any strict fashion. Instead, the interview guide focused on three overarching sections: 1) *Climate change risk perception and consequences.* This section included questions about the participants' general perceptions and immediate associations surrounding climate change, their appraisal of the risks and consequences of climate change, and their thoughts about the potential consequences of climate change on society and their own futures. This section aimed to address the main question of the study, i.e., how students perceive the risks associated with climate change. 2) *Coping beliefs and barriers to behavior change.* This section included questions about the participants' thoughts about how they think climate change should be dealt with. This also included questions about how they dealt with the issue in their everyday lives, whether they were taking personal actions meant to mitigate climate change, and the extent to which the issue was talked about in their social circles. This section aimed to address the research question surrounding the respondents' perception of their own abilities to ameliorate the risk of climate change. 3) *Climate communication and public discourse.* This section concerned the participants' perception of the public discourse surrounding climate change, including how they perceived the media coverage, and where the participants themselves sought out information concerning climate change. See Appendix A for the interview guide.

Recruiting

Students from NTNU were recruited for this study. University students comprise a group that can be expected to experience consequences of climate change in their lifetimes, and by virtue of attaining higher education, they are part of a group that is likely to be politically influential in the coming decades. Furthermore, they already experience the media coverage and public focus on the phenomenon of climate change. Participants were recruited from both the campus for social sciences and humanities and the campus for natural sciences and technology. Recruiting was done through brief presentations at university lectures and through talking to students in the university cafés. In addition to this, one participant took contact and requested to participate in the study after having been tipped about the study by a previous participant. In total, there were 15 participants, thus exceeding the goal of 12.

Students that were interested in participating in the study received a printed letter with information concerning the study and the ethical rules, including the voluntariness of participation, anonymity and the right to withdraw participation at any time. They also got reassurance that no personally identifiable information concerning the participants would be stored or published (see Appendix B).

Interview Procedure

The interviews were carried out in various locations on the campuses of NTNU, based on the convenience of the participants. The interviews were recorded with a digital tape recorder that was borrowed from NTNU's Institute of Psychology. The tape recorder was tested in advance of the interviews to ensure its proper function. Participants were informed about the recording procedure ahead of the interviews, and verbally consented to the interviews being recorded. The recordings and data materials were stored securely locked up, and not connected to the names or other identifiable information concerning the participants.

At the start of the interviews, the information regarding participation, withdrawal and consent was also discussed with the participants to make sure that they were aware of the information and consented to the procedure. The consent was then collected verbally on tape to minimize the handling of confidential papers.

The interview guide was designed using a semi-structured format, where open-ended questions were meant to allow the participants to answer freely to go into further depth, and allow the interviewer to use follow up questions for additional information as well as follow up on possible new ideas that were elicited by the responses of the interviewee.

Transcription and Data Analysis

After the interviews had been completed, the recordings were transcribed using an orthographic method of transcription: that is to say, a verbatim record of what was actually said during the interviews in standard written language, without any addition of phonetic details. In more complex forms of transcriptions, e. g. utilizing analyses based on some form of phenomenological approach, it is common to include phonetic and non-verbal information so as to not only relay *what* was said but also *how* it was said. However, thematic analysis was chosen as the method of data analysis in this study, and orthographic methods of transcription are generally deemed adequate for such analysis, provided that the transcript retains the information that is needed in a way that is 'true' to the original meaning of the text (Braun & Clarke, 2006).

Thematic analysis was deemed suitable to the study's aim of exploring students' perceptions and experience of the risk of climate change. A representative quantitative sample would have been advantageous in terms of achieving generalizable results regarding the student population of NTNU, or indeed Norway, and to e. g. estimate effect sizes for different variables. However, such an approach lay outside of the economic possibilities and time constraints of this thesis project. Furthermore, thematic analysis meets the aim of this rather exploratory thesis project. The goal of thematic analysis is to identify themes in the data material, and is described by Braun and Clarke (2006) as being "a flexible and useful research tool, which can potentially provide a rich and detailed, yet complex, account of data" and can be applied across a range of theoretical and epistemological approaches (p. 78). It has been argued that thematic analysis is more of a tool than a method as such, and that organizing meaning into themes is something that is common across qualitative methodologies. Braun and Clarke (2006) argue that it should nevertheless be viewed as a method in its own right.

While thematic analysis has sometimes been described as a process where themes 'emerge' from the data, some researchers have highlighted the active role the researcher plays when it comes to identifying patterns in the data and selecting which patterns are of interest and worth reporting to the readers (Braun & Clarke, 2006). Similarly, the analytic choices in this study will be shaped by my own conscious choices and theoretical positions. As Clarke et al. (2015) argue, within a qualitative paradigm, researcher subjectivity is unavoidable and something that should be embraced rather than viewed as a problem to be managed. Nevertheless, the work with the actual interview responses was guided by the goal of

producing an analysis that is data-driven, where the codes and themes should reflect the actual statements of the participants and the contexts in which the statements appeared. To further strengthen the reliability of the thematic analysis, an inter-rater test was performed. See description of that work further below.

One criticism that has been leveled against theme-centered methods of analysis is that they may fail to retain a holistic perspective of the text. When comparing text excerpts from different informants with each other, the text excerpt is divorced from its original context. Thaagard (2018) points out that to counteract this pitfall, it is important that the information from each informant is seen in relation to the context of the text that the excerpt is part of. As such, the researcher should not just compare the textual excerpts against other excerpts from other informants, but also analyze the excerpts in relation to the interview as a whole. The following description of the analytic process tries to meet these considerations.

The Steps of the Analytic Process

Braun and Clarke (2006) describe the following six-step outline of how thematic analysis can be applied: 1) Familiarizing yourself with your data, 2) generating initial codes, 3) searching for themes, 4) reviewing themes, 5) defining and naming themes, and 6) producing the report (p. 87–93). However, as the authors note, "analysis is not a *linear* process of simply moving from one phase to the next. Instead, it is more *recursive* process, where movement is back and forth as needed, throughout the phases" (p. 86). This outline has guided my work in the process of analyzing the data, i.e. steps 1–5. Similar to what the authors describe, I have found it necessary and useful to not work through these steps in a linear fashion, but to move back and forth between the steps along the way, making revisions to previous steps when needed, before considering the parts in relation to each full interview.

It was decided to not analyze whole interviews before moving on to the next interview. Instead, it was decided to analyze one part of an interview, before analyzing the same part of the next interview. This way, it was judged that it would be easier to get a sense of thematic similarities and differences in the same main sections or parts across the different interviews. The interview guide consisted of three overarching parts (see description of interview guide), and the order of the analysis was based on this organization. First, part 1 was analyzed in interviews 1–15; then part 2 in interviews 1–15; and finally part 3 in interviews 1–15. After this, each interview was considered in its entirety, so that each part of the interview could be checked against the whole interview.

The analytic process began already during the interviews by writing down initial thoughts and reflections related to the responses. After some of the interviews were completed, I began transcribing the completed interviews word for word. It was decided to not postpone the transcribing until all the interviews were completed to save time. During the transcription process, ideas and initial thoughts about the data material were written down separately.

After all the interviews had been transcribed, the second step of the process began, and initial codes were generated. This was done systematically through the entire data set by splitting the transcribed interviews into text segments and generating appropriate codes for these text segments of unique meaning. During this process, notes were written about possible themes that were identified in the material.

In the third phase of the analysis, the data (i.e. divided into the specific interview guide parts) and the initial codes were reviewed with the goal of generating themes. The codes were compared within interviews and across different interviews to see if common ideas and themes could be identified. Sub-themes that didn't fit immediately into the initial main themes were put in a miscellaneous category, and were considered again to see if they fitted under already existing themes or gave rise to new possible themes. Table 1 shows an example of the analytic process during phase 3.

Table 1
Example of results from the analytic process in phase 3.

Text excerpt	**Code**	**Sub-theme**	**Main theme**
Q: What do you think a person can to in order to mitigate climate change? A: … if I'm going to give advice, then it would be to think a bit about it in everyday life and try to do some research on which food items are … environmentally friendly, produced in a sustainable fashion.	1. Gathering information can help. 2. You can eat more sustainable food.	Individual actions	Actions

During the fourth phase, the main themes and sub-themes were revised and adjusted. This was done by looking closer at the text excerpts of the different codes of each theme, to ensure that the themes were appropriately related to the actual interviews. During the fifth phase, the themes were named and defined. Since the interview guide consisted of three different sections that dealt with somewhat distinct topics, and because the data material was coded by looking at one section of the interviews at a time, it was decided to create separate sets of themes for each section of the interview guide. Furthermore, by creating a separate set of themes for each section of the interviews, it was deemed that it would provide a more precise overview of how the three sections of the interview were distinct or similar in terms of the themes that could be categorized. If one set of themes had been created for the entire interview, this would have resulted in one set of unique themes across the entire interview material, but such a procedure and unique set would mask the specific category content within each interview part. In this project it was of interest to provide overall results as well as present results specifically related to the parts of the interview. However, since a separate set of themes was created for each of the three sections of the interview, the results show a degree of thematic overlap between the three sections. The results section will therefore also provide an overall thematic structure of the results, and the discussion section will reflect on how to interpret the unique as well as the repeated themes from the interviews. The last step was to report the results. Those will be presented in the results section below. When writing the report, quotes were selected from the interviews in order to illustrate the themes. The aim was to select quotes that were representative of tendencies among several of the participants, that were considered to illustrate the relevant themes particularly well, or that showcased the range and difference of opinion between the respondents. It was also attempted to select quotes from all of the participants and to use quotes from respondents from both campuses as often as possible. The interviews were carried out in Norwegian, since this was the first language of the respondents and would allow them to express themselves most freely. However, since this thesis is written in English, the author has translated the quotes used in the report into English. The translation aimed to be as true to the wording as possible, while allowing the original meaning to be as clear as possible.

Evaluating Inter-Rater Reliability

After the second phase of the analysis by the author, when all of the data material had been analyzed for initial codes, parts of the data material were also coded by a fellow student.

This was done with the purpose of comparing the similarities and differences in the generated codes in order to estimate the inter-rater reliability. This second coder coded part 1 from one interview, part 2 from a second interview, and part 3 from a third interview. It was ensured that these interview excerpts would not contain personally identifiable information regarding the participants, to ensure their anonymity. The fellow student was provided with the interview guide and asked to code the selected parts by putting labels on meaningful bits or excerpts of the interviews and to organize these into codes, but got no other information about how to perform the work. After this was done, we compared our codes for similarities and differences and discussed our thought process. We also discussed and compared the sub-themes that we had constructed. Based on this, a subjective assessment of the inter-rater reliability was made. The inter-rater agreement was judged to be high overall, with much overlap in terms of which parts of the text excerpts were coded and how they were interpreted. Nevertheless, there were some differences such as in the number of codes generated for some of the text excerpts. The discussion about these differences in coding formed the basis of some revision of my initial codes.

Ethical Considerations

The study project was reported to the Norwegian Center for Research Data (NSD) for approval, with an application describing the research project and the intended usage of personal information from the study participants. The application (reference number: 532807) was approved under the condition that the interview guide should be revised to match the template provided by NSD. These revisions were made, and the project was subsequently approved.

One important step was to ensure that the participants could give an informed consent before participating in the study. To achieve this, information about the aims and design of the study was given during recruiting, and interested participants received a letter of information concerning the study, outlining also the right to withdraw participation, and anonymity. Ahead of the interviews, the participants were asked to read through the letter of information (see appendix B) and then give a verbal consent that was taped at the start of the interview. The study wished to ensure the anonymity of the participants, and did not collect, reveal or publish any personally identifiable information about the participants. The only information published concerns which campus the student belongs to, which in itself does not lead to risk of personal identification. Participants were furthermore informed that they are allowed to withdraw their participation in the study, for any reason, up until the publication

date. Any quotes used in the study have also been anonymized so that they protect personal integrity and privacy.

Results

The results section will present descriptions of the main themes and sub-themes that were generated from the data material. Because the interview guide was divided into three sections that were each concerned with its own overarching topic, and because the data material was coded by analyzing one section at a time, this result section will present the results from each of the three interview guide sections in turn. This will illustrate which themes and sub-themes appeared in the different sections of the interview and how the different interview sections overlapped and differed in terms of the themes that were identified. For each interview guide section, each main theme and their sub-themes will be described briefly and illustrated with relevant quotes from the interviews. At the end of the results section, the overall results from the three interview sections will be summarized. In the following section participants will be referred to by gender-neutral pronouns (they, them, their) to protect their anonymity in the text. However, since the participating students were deliberately recruited from two different campuses—the campus for social and humanistic sciences ("SSH" in the following text) and the campus for natural sciences and technology ("NST" in the following text)—information about which campus the participants belonged to will be added to the quotes.

Interview Guide Part 1

The first section of the interview guide contained questions that were meant to explore the participants' general stance concerning the issue of climate change and their risk perception regarding the issue. The participants were asked about their first associations concerning the topic, what effects they thought climate change might have and about the influence of climate change in their personal lives. The main themes and sub-themes of section 1 will be presented in Table 2 below. In the following text, a general description will be given for the main themes and sub-themes of the section, and relevant quotes from the interviews will be used to illustrate the themes.

Table 2

Overview of main themes and sub-themes for the first section of the interview guide.

Main themes (5)	***Sub-themes (20)***
Risk aspects	General consequences Personal consequences Personal safety and distance Nature and wildlife Uncertainty
Salience	Urgency Thinking and worrying about it Media / public discourse
Personal stance	Pessimism Optimism Ambivalence Responsibility Politics
Social context	Public awareness Social norms Social influence
Actions	Systemic solutions Personal actions and habits Barriers Response efficacy

Risk Aspects

The topic of risk aspects, as perceived consequences, was a central theme in the first part of the interview, both with regard to the interview questions and the answers given by the participants. The participants frequently described what they expected to be the consequences of climate change, on a global level, on society, on a personal level, and with respect to the rest of nature. As an extension of this, the participants also discussed the extent to which they felt that climate change was an urgent risk to them personally. Several of the participants expressed how one might feel both a sense of physical and mental distance to the issue due to living in Norway, due to being relatively sheltered from the most severe consequences of climate change.

General Consequences. The first interview section specifically asked about the participants' perception of the potential risks and effects of climate change. Therefore, a prominent theme across the interviews was that the participants reflected on the consequences they thought climate change would have for the world and society in general. However, already from the first question, which asked the participants to freely associate about the issue of climate change, several of the participants mentioned the various potential consequences that they associated with the issue. This suggests that potential risks and future consequences of climate change were salient features of the participants' associations to the issue. When asked to freely associate, one participant quickly focused on the general consequences of climate change in this way:

> "The immediate associations are that the poles are melting, that's what it is. Then there is the global warming, which is what leads to it … and then there's that coming refugee crisis which, what is it, climate refugees and stuff like that. Which will be major, which I think will be a major issue, like, later. So yeah, those are the immediate things that I can think of now" [SSH]

Another participant stressed how the potential consequences of climate change had made an impact on them already as a child:

> "The first associations are probably rising sea levels. Sea levels and extreme weather, that's like—I have been hearing about that since I was little. That is, I do still remember when I was maybe seven, eight years old, right, and began to become aware of a bit of talk about climate change for the first time. And then there was a lot about this regarding rising sea levels … and yeah, more extreme weather, precipitation, more powerful storms. It's first and foremost those things that I think about. Sea levels, and areas becoming unlivable." [NST]

Personal Consequences. A related but distinct theme was reflections regarding the future consequence that climate change might have on the participants' own personal lives.

Here, the participants expressed differing views. Some participants felt that climate change would not have a dramatic effect on their own lives or their future prospects:

> "I don't think, at least from what I have in a way learned so far, that climate change will affect me to such an incredible degree. Except for the measures, right, that society and I personally should carry out to potentially be a part of improving the climate. So I don't think that I will be feeling it, like, physically or notice it to such an incredible degree concerning the environmental and the weather and the climate aspects in that sense. But I do absolutely believe that we'll be noticing it in terms of new solutions, new, more environmentally friendly solutions, more focus on electric energy, transportation based on electric energy, and less emissions in the industry in general." [NST]

In contrast, a couple of participants admitted that the threat of future consequences from climate change had made them doubt whether they wanted to have children, indicating that the issue of climate change was having a major influence on how they viewed the prospects of their future lives and future generations:

> "I don't think that I will have a very awful life. But I am feeling a bit that—I have been kind of thinking a bit about the idea of giving birth to something into this world, it is honestly not so tempting anymore. Because I don't think it will be—that is, the amount of climate refugees, and then closed borders and the disruption that I think climate change will cause, that's kind of not something that I want to put someone through." [SSH]

Personal Safety and Distance. Closely related to the theme of personal consequences, many of the participants also reflected on the degree of safety that they felt from negative consequences of climate change. Some of them also noted that this safety might lead to a feeling of distance from the issue, both physically and mentally, in the sense that the issue might feel urgent because it did not feel like a personal threat to them specifically. Moreover, several participants highlighted the fact that Norway as a country is

quite shielded from the worst consequences, adding to the sense of safety or distance with regard to the issue:

> "But I feel that we are pretty secure, right. In a way I don't feel very scared about it." [SSH]

Another participant described how the feeling of safety from living in Norway could make it harder to fully appreciate the seriousness of climate change:

> "And then it's a bit distant for us here in the Nordic countries, in comparison to other countries that are more at risk, where a tiny swing in the climate has much greater consequences than here. Here it's just a bit extra cold or warm in the winter or summer, which is maybe a bit uncomfortable or even a bit comfortable for us. While other places it's life or death, right, with floods and droughts … so then it's difficult for us to properly appreciate it as well." [NST]

Nature and Wildlife. Several of the participants also revealed that they were particularly concerned about the effects that climate change would have on the rest of nature, such as ecosystems and other animal species. Some of them also discussed the relationship that humans have to the rest of nature and stressed that humans have a particular responsibility when it comes to taking care of the rest of the natural world. For one participant, thoughts about the loss of species was the first association that came to mind when thinking about the issue of climate change:

> "Yeah, immediately I think about the loss of species and stuff like that … That's at least the topic within climate change that I feel that I, uhm, react to the most or think the most about … Species that disappear and species that are displaced and—yeah. So that's perhaps what I think about, at least takes up most of my attention." [NST]

Another participant felt that these negative consequences on the rest of nature would also have negative repercussions for humans:

> "That's probably what I think about the most, and especially the animal populations on the poles get less space to live on, right. There's a lot concerning that … if you mess with the ecosystems, that's not good either. You get consequences for animals and ecosystems on land as well … it becomes like a butterfly effect." [SSH]

Uncertainty. Several of the participants also stressed the fact that there is inherently a lot of uncertainty involved when it comes to the consequences of climate change. Many of the consequences are far removed in time or space, and several of the participants noted that this led to a feeling of uncertainty about the consequences that the issue would have. One participant stressed the remoteness in time:

> "Because it's so far ahead, right. We won't—it's so far ahead that we don't know exactly what will happen, even if we are pretty certain like roughly what will happen. So then maybe people won't make changes." [SSH]

Salience

This main theme concerns the ways in which the participants described whether they experienced climate change as a salient issue. Several of the participants made references to the media focus on climate change. Many described spending a lot of time thinking about the issue in their daily lives. Several participants also stressed the urgency that they felt with regard to the importance of tackling climate change.

Urgency. One particularly frequent sub-theme across the interviews was the sentiment that climate change is a particularly urgent threat. Many participants stressed the fact that they feel that time is running out when it comes to mitigating or stopping the progression of global warming, and highlighted that they felt that drastic global changes would have to be made in the near future if the threats posed by climate change are going to be minimized. One participant immediately stressed this sense of urgency when asked to freely associate about the issue of climate change:

> "Uhm, I think a bit like: crisis [laughs] … so it's beginning to be a bit urgent, I think. So I think a lot about it, I'm trying to do my part…" [SSH]

Another participant pointed out that it feels like the issue is not being dealt with quickly enough considering the urgency of the issue:

> "It does seem like it has big consequences. And that it's really too late to do a whole lot. But it's not, you can always do something. But it's going too slow." [NST]

Thinking and Worrying About It. Many participants admitted that they think about climate change a lot, and several of them also described that the issue was something that they might worry a lot or have negative thoughts about. One participant described how thinking about the issue of climate change affected them:

> "Yeah, it does affect me a lot, I notice that. Now, in a way, now I know that I am going to talk a lot about it, but if I get into a discussion with someone about climate change, then I quickly get very down and sad because I think about how badly it is going. So that's something that really affects me, yeah. A bit like, mentally, then … but it's a bit like that, yeah, I guess it's mostly mentally that it affects me and will end up affecting me." [NST]

Another participant described thinking about the issue on a daily basis, sometimes several times a day, suggesting that the issue was particularly intrusive. The participant similarly pointed to the negative feeling associated with thinking about the issue:

> "I think I actually think about it daily. You get constantly reminded about it … so it's daily … sometimes up to several times a day. And, yeah, it's very hopeless, then. But it comes, a bit too often, thoughts about it, yeah … But so I think a lot about it, and it's usually like negative thoughts about it. Like, yeah, we have to change this and so on, and then I think like, yeah, okay, is there something I can do?" [SSH]

Media / Public Discourse. Several participants also made references to how the issue of climate change might be salient through the media's coverage of the issue or through the public conversation more generally. As one participant put it:

> "Now that it's kind of been so much in the media, then of course it's something you think about." [SSH]

Another participant pointed out how it is important to be critical of the various media sources that are covering the issue, highlighting the fact that influential people on social media could have a big impact on how the issue is perceived by people:

> "It's hard to discriminate between – it's very important to be critical to what you read today … And then there are a lot of people today who get their news through Facebook and Instagram. And then if it's, in a way, someone with several million followers on Instagram, then, who shares it, "Yeah, now everyone needs to help," then it has an insanely big impact." [NST]

Personal Stance

This main theme describes the various ways that the participants expressed their own personal stance when it comes to the issue of climate change. Many of the participants conveyed their own values, attitudes or opinions toward various aspects of the issue. Furthermore, many of them also described how they reacted to the phenomenon on a more emotional level, such as whether they felt scared, worried or optimistic concerning the potential consequences of climate change or the potential for successfully mitigating the issue.

Pessimism. Several of the participants expressed that they felt pessimistic concerning the chances of preventing or successfully mitigating negative effects of climate change. Some of the participants expressed their pessimism regarding the issue as early as the first question, where they were asked to freely associate concerning the issue of climate change. A subsequent question in this section of the interview guide asked how the participants viewed

the likelihood of meeting the UN's climate goal of limiting global warming to below two degrees Celsius. In response to this, many of the participants explicitly stated that they were pessimistic about the prospects for achieving the goals of international climate agreements:

> "Yeah, that's perhaps a bit optimistic. Yeah, no, I don't know. I am a bit skeptical. Was it the USA that pulled out of the Paris Agreement not so long ago? So it is—yeah, I don't know. It's probably not quite evenly distributed a bit like which nations are motivated for working towards it … It's, what should I say, it's better to be ambitious than to be apathetic in a way. So. But yeah, I don't know if I have, like, a lot of faith that we are going to achieve it." [NST]

Another participant felt that the negative effects of climate change are already well on their way, and that the best we can hope for is to limit them rather than reverse them:

> "Like, climate change, that's well on its way. It's more about mitigating the changes rather than to reverse them completely. It's possible that that's not realistic." [SSH]

Optimism. In contrast to the above theme, some participants also expressed optimistic or hopeful sentiments related to the issue. Probably the most frequent area of optimism was that of technology, where several of the participants described being hopeful about the prospect of positive technological developments that could help mitigate the threat of climate change:

> "Uhm… I don't go around worrying, I don't really think that much about it. But that's a bit because of the fact that I see it as a more broader question, the fact that I think we will be able to come up with new technologies that can contribute to reducing emissions significantly."
> [NST]

Some participants also expressed optimism concerning the changes in public attitudes that they felt were happening and with regard to rising activism among young people. Some also

expressed optimism about the prospect of successfully mitigating the issue of climate change or felt that the consequences might not turn out so dramatic. Similarly, some felt that people might find it easier than some people fear to adapt to challenges presented by climate change. One participant expressed optimism about the positive mitigating actions that were already taking place:

> "I do feel in a way that we are already heading a bit in that direction, and I think it seems logical that it will continue and that people will see the potential in that. And I have a lot of belief in that potential myself, too." [SSH]

Ambivalence. In many ways, ambivalence was a theme that was also relevant within many of the other themes in this section. Nevertheless, ambivalence also appeared to be salient enough to warrant a sub-theme of its own. Several of the participants expressed a tension between wanting to make personal or societal sacrifices for the environment on the one hand and wanting to have comfortable lives or maintain their current lifestyle on the other hand:

> "But I also think it will be difficult, I feel that it will be difficult, but I also strongly believe that there needs to be less meat production, and milk too for that matter, even if that hurts a lot for me because I love cheese and butter [laughs]." [SSH]

One participant described having felt ambivalent about the issue due to having family members in the oil industry. Several participants spoke of the necessity to balance concern for the environment with other concerns, or to not let the concern for the issue of climate change take over one's life. One participant described an ambivalence stemming from the fact that they held optimistic and pessimistic views about the issue at the same time, leading them to feel conflicting emotions all at once concerning the issue:

> "But I think about the fact that there are many opportunities because of the changes that are happening, and that we are beginning to understand that we need to change ourselves along with these changes in order to make those changes go in the direction

that we want. At the same time as I perceive a lot of, in a way, fear and resistance, and sort of some negative attitudes related to that. So I feel that I want to be optimistic, but also that I get scared. And that I occasionally can feel very strongly that it is serious and that not enough is being done and that you – yeah, that I feel small and that I am faced with something which I absolutely cannot do anything about on my own." [SSH]

Responsibility. Several participants expressed the view that we all need to do our share in order to combat the issue of climate change, and that we have a responsibility to do so:

> "So I think we have an incredibly big responsibility to make sure that this doesn't go out of control. Because there are a lot of facts on the table that say we cannot keep going the way we have been going. But there is so much more than it was in earlier times, when we first started to get the modern society that we are now benefiting from." [NST]

Some underlined the special responsibility of politicians and people in power, suggesting that they should be doing more to mitigate the issue. Some also stressed that the general population has a responsibility to put pressure on politicians. Furthermore, several participants focused on the responsibilities of different generations. For some, they felt it was unfair that so much of the responsibility for tackling climate change is being put on the younger generations in general or on particular young individuals such as Greta Thunberg. According to some of the participants, older generations were the most to blame for causing climate change and therefore had the greatest responsibility when it comes to addressing the issue:

> "… and then I think that it's in a way not their task to be thinking about it. Adults should actually be there and take care of it. And it's really not right that a 16-year-old girl is being fronted, either, as the voice for the climate crisis, I think that's a wrong

start already. It really shouldn't be that generation who should take care of it, it should be the generation before us who should fix it." [SSH]

Politics. Responses concerning politics were also widespread in the interviews. Some participants stressed the role that voters play in shaping the political system, other participants spoke about the need for political leaders to make changes and implement policies that are helpful for the environment or expressed frustration that politicians are not doing enough. One participant described in the following way that the issue of climate change could become overly political, which could alienate some people from being engaged with the issue:

> "… the fact that it becomes political, that can perhaps be a bit polarizing. Today it can be difficult—like, in a way you have the right-wing, they have a focus on climate change and climate measures, but not as much as the left-wing, the Green Party and so on. But those on the right are in turn more critical of immigration, for instance. So in a way you cannot be critical of immigration while being simultaneously very concerned with the environment in a way. You sort of don't have any parties that fit that. So you have to choose what you are most concerned with, then." [NST]

Many of the participants also discussed the topic of international politics, especially the necessity of international cooperation when it comes to dealing with the issue of climate change, and the challenges in succeeding with this type of international cooperation:

> "I think that there needs to be better cooperation between the big powers. And that everyone shows a willingness to make changes, and to do what is needed … that for instance all of America abstains because Trump doesn't believe in climate change." [NST]

Social Context

This main theme describes the various ways in which the participants talked about their social context. Some made comments about the public's attitudes on climate change. Many discussed the values of their social group or the ways in which they were influenced by their social circle.

Public Awareness. Several participants commented on how they perceived the public's awareness of the issue of climate change. One participant expressed frustration concerning the perceived attitudes of a lot of adults regarding the issue:

> "And I also get insanely dejected when I see how many horrible people there are on Facebook and stuff like that … And there are a lot of people who have strong opinions about the environment and stuff like that, but then the actions say something different, and become a bit like: 'OK, how much do you really care?' … Then I really start to doubt whether it will be fine, when I see that there are so many adults who just – oh! – don't have a clue. Annoying." [SSH]

Another participant had a different focus on the issue, arguing that the public awareness of the issue seemed to be increasing compared to earlier times:

> "So it's something you are conscious of all the time. And to a much greater extent than perhaps five, six years ago. There has been a much greater focus both on climate change and on pollution of the oceans and all of that … Before it was perhaps a bit reserved for the specially interested." [NST]

Social Norms. A related theme was the participants' discussions about the perceived social norms concerning climate change. Several participants pointed out how there can be a clear social expectation that people should be environmentally conscious, especially among young people. One participant put it this way:

> "Yeah, then you are in a way a bit socially—I was about to say retarded, but that was a bit strong a word. To be socially conscious today, at least when you are a young person, then I think that you have at least thought about it, and probably thought that you are going to do something in order to do some mitigating actions in your life." [SSH]

Another participant described how social norms were starting to change so that environmental actions are starting to be seen as more hip and more of a norm:

> "Yeah, I do hope that the social norm will be that people do more environmentally friendly things. And it is starting to become a bit, starting to become a bit, like, cool. 'Oh, you have the environmental app or this chatbot' which has the environmental challenge of the week and stuff like that. It's become more commonplace in my social circle." [SSH]

Social Influence. Several of the participants also discussed the role of social influence when it comes to shaping attitudes. This included both reflections about how others had influenced their own attitudes concerning climate change. One participant described how the environmental values of friends had been inspiring:

> "… maybe just because I have changed my attitudes a bit in the last year. But I do feel that, at least my circle of friends is making some changes. It's very like, people are flying little, people have almost stopped flying … there won't be any more foreign travels for me without going by train. Now it's full stop. So I do feel in a way, I do feel that I get inspired by those around me. I kind of hope that can help." [SSH]

And also thoughts concerning how they could potentially influence the attitudes of other people:

> "But without knowing how it will look, I at least know that I want to do as well as I can to create habits that make it easier for me to live in a climate-friendly way, and which can perhaps help others to see that it can be fun and engaging and fine to live in a climate-friendly way." [SSH]

Actions

This main theme concerned the participants' reflections regarding actions that could be taken to help mitigate climate change.

Systemic Solutions. Several of the participants expressed the view that it would be necessary with systemic solutions in order to meaningfully tackle the threat of climate change. One participant argued in the following way that individual actions would not be sufficient in order to mitigate climate change, with systemic measures directed at industry being more important:

> "We talk very much about the duty of the individual or something—you shouldn't use too much plastic, you shouldn't do stuff like this. But we also have to look at what's the largest share of the emissions: these large mega-corporations … like, the meat industry is gigantic. I don't know, I read some statistic about how it is food production in itself—meaning the industry behind it—is 20 or 30 percent of all the emissions … so it's more about, for me it's more about sanctioning those who are really big, rather than—so, we should all pitch in our share, but that's where the real problems lie." [SSH]

Some of the participants focused especially on the need for technological solutions:

> "I think, in a way it should … if we're going to succeed in a way, to make it better, then we have to invest an extreme amount of money on expanding clean energy, or renewable energy as it's called. Solar power, hydropower, uhm – I'm also a … I also support nuclear power." [NST]

Personal Actions and Habits. In addition to focusing on systemic solutions, several of the participants also discussed the role that individual mitigating behaviors played in their own life. Several participants mentioned that they tried to do conscious actions meant to tackle climate change. One participant highlighted meat consumption as an example of such actions:

> "But there are a lot of—I think it's becoming more and more common to eat less meat, but it has to be facilitated, the opportunities for it aren't always in place. Like, personally I try to limit it a bit with red meat, but it's not the easiest, I notice that." [NST]

Some participants also described doing environmentally conscious actions even if it is sometimes not the most practical or easy choice:

> "Yeah, yeah, absolutely. I make a lot of conscious choices in my everyday life. And it's not because it is easier for me. Like, in most cases it is more stressful to be more climate-friendly, right, so if there had been no use and function behind those little things that I do, then I wouldn't bother. Like for instance to recycle, of course that's more stressful than to just throw everything into one trash can and not think about it." [SSH]

Barriers. Several of the participants also discussed the various barriers that could make it harder or less desirable to adopt climate-friendly actions. Several participants argued that climate mitigation would also require us to give up certain other goods, which could act as a barrier to mitigation:

> "And then I don't think that we can quit the oil industry and maintain the income levels and the welfare at the same time, because there's so much income from there." [NST]

Some other participants highlighted the fact that climate change might compete with other issues that will also be necessary to solve if we are going to successfully tackle climate change:

> "… but then there's constantly an increasing number of people, and that demands a lot of energy, and everyone should have a good standard of living. So I feel that there are a lot of such small problems that have to be solved before we can tackle the really big ones. There is a lot of hunger and poverty in the world, so these UN climate goals are that we need to solve that part before we can tackle the big climate problems." [NST]

Response Efficacy. Some of the participants also discussed whether they felt that their personal actions had any meaningful effect when it comes to mitigating the negative effects of climate change. Some took a more pessimistic view about the effect of individual actions, suggesting that the effect is negligible:

> "… okay, is there anything I can do? Then it is difficult to think that you are just a drop in the sea and stuff like that." [SSH]

Some other participants maintained that the individual actions did have a meaningful effect which made them worth doing:

> "So if there hadn't been any use or function behind those little things I do, then I wouldn't have bothered … It's always something I have in the back of my mind, that I am doing this because I want to help a little bit at least and make a little difference." [SSH]

Interview Guide Part 2

The second section of the interview guide was concerned with questions about mitigating actions and solutions and about the social norms that the participants experienced. The participants were asked about the things they thought people could do in order to mitigate climate change. The questions also explored the role that such mitigating behaviors played in their own lives. The participants also reflected on the norms of their social group. Lastly, they were asked whether they thought that climate-friendly actions have any meaningful effect. See Table 3 for a summary of the main themes and sub-themes from this section of the interview guide.

Actions

The most central main theme of this section was the topic of actions. This included more general, abstract answers concerning which actions a person could do if they wanted to mitigate climate change, but also contained reflections on the environmentally focused actions that the participants were carrying out in their own life, if any. The participants also discussed the perceived efficacy of carrying out actions aimed at climate mitigation. The

participants also mentioned a range of different barriers that could make climate-friendly actions difficult or undesirable to carry out and various benefits that could be gained from acting in an environmentally friendly manner.

Table 3

Overview of main themes and sub-themes for the second section of the interview guide.

Main themes (2)	***Sub-themes (10)***
Actions	Systemic solutions Individual actions Personal actions and habits Response efficacy Response knowledge and uncertainty Barriers Benefits Politics
Social context	Social norms Social influence

Systemic Solutions. The theme of systemic solutions was central both in the first and second sections of the interview. However, since the second section of the interview guide was specifically concerned with actions and solutions, the topic of systemic solutions featured even more prominently in this section of the interview. Several of the participants made reflections concerning the relative importance of individual actions and systemic solutions, and numerous participants pointed out that they felt systemic solutions were more necessary than individual actions when it comes to tackling climate change:

> "Uhm, I probably think that it's much more, uhm, it would be much better if you get top–down-regulated measures against climate change rather than being dependent upon individual persons figuring out that they want to be environmentally friendly, and then that adds up to limiting climate change." [NST]

Another participants echoed these sentiments:

> "But again, I would rather mention that there has to be more of a kind of sanctioning of big companies. In that respect, I don't know if you have seen the pictures of how the sky in Beijing looks, because they have these huge factories, right. And that's the type of pollution that we have to cut down on, and not necessarily on the level of the individual." [SSH]

Individual Actions. However, the participants also frequently mentioned and suggested various individual actions that they felt a person could do in order to mitigate climate change:

> "It's to cut down on driving, meat, consumption, uhm, things that demand a whole lot of energy which then comes from fossil fuels. Or, yeah. Eating more local food I think is very important." [SSH]

Others also highlighted how larger life decisions, such as career choices, could have important effects in terms of the environment:

> "And especially – I'm entering the job market quite soon, and then it's important to think about where you want to contribute and what you want to contribute with and to what extent you want to let it control your life as well." [NST]

Personal Actions and Habits. In addition to making general suggestions about which individual actions people could do, many of the participants also described the place that such actions occupied in their own lives. One of the most common things that the participants reported doing was to try to reduce consumption and waste, and to repair things instead of buying new products:

> "But I also try to think about fixing clothes instead of just buying new ones. And then I like to sew and to knit and stuff like that. But then there are some of those textiles … I have no idea whether they have been made in a climate-friendly way … but I try to at least choose organic cotton, like, if something is certified or something … I try to

do some research and choose something that is better than the other. If it's not perfect, it might perhaps make a little difference." [NST]

Response Efficacy. This sub-theme concerns the reflections the participants made about whether individual mitigation behaviors have any meaningful effect. Here, the participants expressed differing views. Many of the participants described a strong conviction that individual actions do not have any meaningful effect on the climate:

> "I don't think that an individual person's choices matter much in the big picture … Yes, I think that those small things from the individual do not make much of a difference in the big picture." [SSH]

Several of the participants stressed a certain ambivalence, noting that a single person cannot make much of a difference by himself, but that if enough people think their own choices matter, then it will add up and make a meaningful difference:

> "Uhm, one person, then it doesn't make any difference. But if everyone—say, all the one-persons [laughs] do something, then it would be a lot people who are doing something. So I think that as long as you are aware of that and don't think, yeah … that's the scary mentality, that, 'yeah, yeah, if I do this just one time, it's not a big deal.' If everyone does it one time, then it's suddenly a big deal. So you have to avoid that mentality, in my opinion … But I think it's important to think that if you and I and they make an effort, then it's incredibly much better than if only one does it [laughs]." [NST]

Response Knowledge and Uncertainty. A common theme among the participants was that it is often very hard to tell which actions are genuinely helpful for the environment and which actions do not have any meaningful effect. Several participants pointed out that actions that appear to be beneficial for the environment are not always beneficial:

> "And then there's the fact that even if you take those so-called environmentally conscious measures, it's not certain that they are environmentally conscious measures either. It could be that, since everything is so complicated and interconnected, then it could be that one of those things that you think that 'this is good for the environment',

> isn't good anyway. Then it's … yeah, those things they had with plastic bags and paper bags. Plastic bags demand less energy than paper bags, so therefore they weren't the best choice for the environment." [SSH]

Another participant expressed frustration about the often-conflicting advice regarding environmental actions, pointing out that it would be easier to get motivated for actions if you felt certain that they had a positive effect:

> "So it would have been easier if you knew that something worked, that there wasn't such contradictory advice. If it were clearer whether it made any difference at all." [NST]

Barriers. Similar to the first section of the interview, the participants once again expressed ways in which certain barriers could make it more difficult to act in environmentally friendly ways. Most of the participants noted various ways in which environmentally friendly choices are often inconvenient or can be costly in terms of time or money. One participant highlighted the impractical nature of many mitigating actions and noted that it might take a lot of willpower to carry out such actions because of the barriers:

> "There are many—so, it's difficult then. It can be more inconvenient if you choose to take the bus instead of driving your car for instance, and it can be inconvenient—you can struggle with willpower if you're going to stop eating meat for instance, I do that myself. Uhm, so it can be difficult and inconvenient if you're trying to carry out these changes, then, because there's always this underlying thought: 'oh, it would have been so much easier to just travel by plane,' right? So it can lead to a—it can make it difficult, then. Because the society around is sort of organized so that we are supposed to live like that. Yes. And the thought that it is an easier solution but maybe not as environmentally friendly." [SSH]

Another participant also highlighted the fact that climate-related changes might pose challenges for industries or have negative effects on productivity:

> "So it's in a way very much the practical things that you lose. And in terms of industry—it can quickly become a lot less productivity, then. And yeah, more

> expensive in some cases too. That's one of the reasons why plastic became so popular, it's because it is such an amazing thing, right. A very good material—it's strong, it's waterproof, it can withstand anything in a way. And it's in a way a bit unfortunate, that you cannot use it in the same way. You can still use it, but in a more controlled manner, in my opinion." [NST]

Benefits. In addition to discussing the barriers to climate mitigation, many of the participants also mentioned potential benefits that could result from doing environmentally conscious actions. One of the most frequently mentioned benefits were the potential health benefits that the participants associated with a climate-friendly lifestyle:

> "In terms of health, you can feel better, you will perhaps get in better shape from biking and walking, instead of driving everywhere. Health foods, and there's the part about lifestyle. Try to eat less, it has been shown that you typically improve your health from that, as long as you get what you need. If you actually go that way and read up and get the information you need to eat more vegetarian, then you will often experience better mental health and feel lighter. Sleep—better sleep. So it's about the mental and psychosocial and physical changes that you have." [SSH]

Several participants also underlined the fact that a potential benefit of a climate-friendly lifestyle is that it might lead to a good conscience:

> "It does help the conscience too, in a way. That you are contributing and yes, in that way perhaps you can get an increased quality of life." [NST]

Social Context

Like in the first section of the interview, the participants provided several reflections concerning their social context. Unlike the first section of the interview guide, the second section of the interview also included direct questions meant to explore the social context, which allowed the participants to go into further depth regarding these topics.

Social Norms. As in the first section of the interview, the participants frequently reflected on the social norms that they perceived in their social circles or in other social groups. They expressed differing views about the social norms of their respective social

groups. For some of the participants, they described being part of a social circle where environmental values were common and central, sometimes leading to a sense of social pressure. For others, they described being part of social groups that were not that concerned with the issue of climate change.

> "I feel it's both yes and no. It is—people often make conscious choices about it, in my experience, but of course you are not always able to be so consistent with the choices you make. I have friends who have stopped shopping for two years and stuff like that, and then I have some who try not to eat so much meat, and then I have those who—yeah, there are very many who use public transportation, but that could be due to other reasons than just the climate, you know … But I do feel that there's some degree of consciousness about it, yeah." [SSH]

> "Some of the people I know are a bit conscious about it. Like, vegetarians for instance. Partly because of emissions tied to meat production. But otherwise I wouldn't say that there are many in my social circle who are very, very environmentally conscious in how they live." [NST]

Social Influence. The participants also made further remarks about the ways in which they had been influenced by other members of their social groups and about their wish to have a positive influence on others. One participant described actively trying to influence others by talking about the issue:

> "So yeah, no, maybe that I discuss it with people, that's perhaps one thing that I do, that I talk a lot about it with people … But I feel I get inspired by others, and I hope that people think, 'yeah, yeah, then I can manage to travel by train as well' … But like, I feel that's where psychology comes into it. Yeah, at least I feel myself that I have been so—it spreads a bit. I can just look at how my mum and dad have completely changed their attitudes completely compared to, say, ten years ago. And it started with my sister dating someone who cared about these issues. And then it has just continued, because we have kind of been influenced by each other." [SSH]

Another participant pointed out that social influence could happen not just through inspiring others, but also through a form social pressure to conform:

> "And then I also feel that there's often a bit of social pressure to behave well. But I feel that that's a human thing in general, that when you are with others you behave differently than when you are alone. So when people are alone and with people they don't know as well, then they aren't always as conscious of the environment and of behaving correctly in that sense … So in that sense it helps to for instance live in a shared apartment and that everyone keeps an eye on everyone and that you recycle things correctly and things like that." [NST]

Interview Guide Part 3

The third and final section of the interview guide was concerned with questions about the participants' relationship to the media and the public conversation. Here, the participants were asked about where they searched for information regarding the issue of climate change, how they perceived the way that the issue is covered in the media and how the issue could be best communicated. See Table 4 for a summary of the main themes and sub-themes from this section of the interview guide.

Table 4

Overview of main themes and sub-themes for the third section of the interview guide.

Main themes (2)	***Sub-themes (7)***
Media	Personal media habits Media focus Negative framing Media quality Want information
Social context	Social norms and public attitudes Social influence

Media

This main theme consists of the various ways in which the participants described their relationship to the media. This included their descriptions of their own media habits and their thoughts about the framing and focus of the media when it comes to covering the issue of climate change. It also captured the participants' thoughts about how the issue of climate

change could best be communicated to a general audience and the types of information that they felt were lacking in the public discourse surrounding climate change.

Personal Media Habits. This sub-theme is concerned with the media habits described by the participants. The participants described differing levels of engagement with the media coverage of climate change. Most of the participants admitted that they frequently searched out information concerning the issue, whereas some of the participants revealed that they did not spend much time reading about the issue. The most common source of information mentioned by the participants was online newspapers. However, some of the participants mentioned other sources where they got most of their information, such as social media:

> "It varies a bit, but right now I must admit that it happens a lot through Instagram. A little bit online newspapers, but there hasn't been so much of that lately … That is, if I follow NRK News, or organizations, UNICEF, those that post, or Greta Thunberg or things like that. And then if something pops up that I'm wondering about, I will search for it, in a way. So right now I think that is the most relevant." [SSH]

Whereas many of the participants described frequently searching out information related to the issue, some also described partly avoiding the media due to finding the news depressing:

> "Round about. People, documentaries … in the media. But then I don't follow the news a whole lot, because it is so depressing. But I do catch things every now and then." [NST]

Media Focus. The participants frequently commented on the nature of the media's focus with regard to the issue of climate change. These answers could concern whether they thought climate change was a salient topic in the media's coverage compared to other topics. They also reflected on the particular features of climate change that they thought the media focused on. The participants held differing views concerning whether the media's focus on climate change is increasing or decreasing. For some, they felt that the topic was getting increasingly more attention in the coverage. Several of them also mentioned that the media might be concerned that people would get tired of the coverage of climate change:

> "There's been an upswing these last months, with the climate strike and so on. But I think that the media write according to—like, they don't want to write about the climate issue if people get tired of it. So—and people can get very tired of it. So then I think they write a lot less about it than perhaps they should, but I don't know how, completely how they consider it." [SSH]

Some participants discussed the specific features of the climate issue that are focused on in the media coverage, with some feeling that the media might focus on the wrong aspects of the issue:

> "I do think that it receives a decent enough coverage. But perhaps a bit more nuanced, not just the biggest and hottest issues. But that every side of it gets debated and discussed publicly. I feel that often the things that get the most attention are the things that are the most obvious. But I feel that there are so many aspects of the whole issue that should receive a bit more attention—that the whole crisis, the whole portrayal of it should be more nuanced in the news coverage." [SSH]

Negative Framing. Most of the participants expressed the view that the media could often have a negative framing in their coverage of the climate issue. This negative framing could include a focus on catastrophes, negative projections, and a focus on negative developments at the expense of describing positive developments. Many of the participants were critical of this perceived negative framing of the issue:

> "Yeah, I do feel that they go quite far. Or, some—it does look bleak, and I do understand that something has to be done about it. But I also feel that they are gaining some advantage from it, to kind of get the clicks, so they take it pretty far. And often—or not often—but I have seen earlier that, 'oh right, it wasn't so bad after all' … and that's, yeah, it's something you have to take seriously, but we aren't going to die tomorrow either." [SSH]

Some participants also questioned the effectiveness of the perceived negative framing of the issue in the media. One participant reflected on whether a too negative coverage might cause people to not take the media coverage seriously:

> "It can sort of have a good effect to a certain extent, I would imagine. But if it becomes too much, then I think—so, then I think it can become too much. Then I think you just get sick of the whole business, really … So it becomes a bit like, if no one is feeling scared, then you can kind of get the impression that the whole thing is a bit exaggerated, maybe. That therefore, then you think, 'yeah, it's exaggerated,' and that can have an effect, it can be like crying wolf. So that—I don't think it's so good, really, to exaggerate. You have to be kind of realistic. And it may be that people should really be afraid. But when no one is feeling afraid, then maybe it's a bit wrong." [NST]

Media Quality. The participants often made reflections and judgments regarding how they perceived the quality of the media's coverage of the climate issue. The views of the participants were somewhat varying here, but a common thread was that many of the participants found the media coverage somewhat lacking or poor in certain ways. One participant described the media coverage as unserious:

> "But I do think in general that it's characterized by—uhm, what should I say? A lot of nonsense [laughs]? Very many leaders who do not seem as though they take it very seriously. And then it seems like it's a kind of fad, or just another thing that is trendy right now. And therefore it's something one should take into consideration or say something about. And yeah, I think it's pretty sad, that it's like that." [SSH]

Some participants highlighted particular media sites as examples of good quality of coverage:

> "But now I only read NRK, which I feel is the most—at least the media I like the best … there there's coverage every day, really." [SSH]

Want Information. Participants frequently expressed that they missed seeing more constructive, useful information in the media coverage of the issue. This could be more facts concerning the causes or consequences, or more information about the concrete measures that a person can do to mitigate the issue. A desire for more information concerning concrete personal mitigation measures was especially widespread across the interviews:

> "… more concrete measures perhaps, more positively loaded … I'm a fan of lists, so perhaps if there had been a kind of list of, these are the most environmentally friendly things that you can do. It does probably exist, but, like, more available." [SSH]

Another participant further highlighted that they would like to see information from better sources, with more research-based information about which actions have a positive effect for the environment:

> "But they could have in a way, for example, taken these kinds of research reports from, say, a credible source that says that if you do these and these things, then it helps; or if you do this thing, then it's very bad … I think that's also a kind of very bad change in the media, that in a way they don't gather the facts from the right place." [NST]

Several participants also lamented the difficulty of finding credible information and being able to discern which information is credible or not:

> "I wish that there was more information from some or other credible source concerning what you can do yourself, and what effect it actually has. That it's not just—I would love to have some numbers … that would be nice, because I don't know where I should begin to check it myself, and I don't know what I should believe once I start to read on the internet." [NST]

Social Context

Similar to the two first sections of the interview, it was still a common theme for the participants to discuss the role of their social context in the third interview section. This included both reflections about the attitudes of society more broadly, the social norms of their social circles, and thoughts concerning how the participants were influenced by other people or might influence them in turn.

Social Norms and Public Attitudes. Several of the participants made comments or reflections concerning the attitudes and beliefs that they perceived among other people or in

society more generally. For some of the participants, they commented on what they perceived as negative public attitudes concerning the climate issue:

> "… and then I spend a whole lot of time in comments sections—only reading though, don't write that much myself—and there I do see, there are very many negative comments concerning the climate issue. So then I get a pretty negative impression of how people really view the climate issue, maybe more than it is in reality. And I think a bit about that, how many people there are who actually support versus oppose the climate movement and believe in climate change." [SSH]

Some of the participants also reflected on the social norms and attitudes of their own immediate social context:

> "But here in my programme of study I don't think I have met anyone who doesn't believe in global warming or man-made … I feel that here at NTNU there is a pretty good awareness around it." [NST]

Another participant highlighted the difference in social norms between different cultures:

> "But so I also feel that we Norwegians have a very good standard of living and have the opportunity to take the choices we want, and that it's easy to fall a bit over onto the comfort zone then, and that it's easy to want to live one's life the way one wants to live it. So I feel that's typically Norwegian, then. When I was away on foreign exchange, then I met a lot of people of other nationalities. I feel that other places in Europe, perhaps especially Germany, they are a lot more concerned with the environment, also the young people, and that they take more action based on that than we do in Norway." [NST]

Social Influence. The topic of social influence also appeared in this section of the interview. Several of the participants mentioned that their friends were a significant source of information concerning the issue of climate change, or that they learned about the issue from discussing the issue with their friends:

> “Yeah, conversations with friends, conversations with people from the place where I’m from who are concerned about it.” [SSH]

> “Yeah, I do a bit of—like, we exchange articles and those kinds of things that we stumble upon. And yeah. So I guess it’s online news and that kind of article exchange, and Instagram. And discussions in a way.” [SSH

Summary of the Results

In summary, the three parts of the interview yielded sets of themes that contained unique as well as common aspects (see Table 5 for an overview). The first part of the interview asked questions about perceived risks and consequences related to climate change. Table 5 shows the three unique main themes of “risk aspects”, “salience” and “personal stance”. The theme of “social context” appeared in all parts of the interview but note that the subtheme of “public awareness” was unique to the first interview part. The main theme of “actions” appeared in both the first and second parts of the interview. The second interview part focused on belief in mastery and barriers to behavioral change. The table shows six communal subthemes and four unique themes in the second part of the interview. Under the main theme of "social context", the sub-theme "social norms" was communal with the first section, and "social influence" was communal for all sections. Under the main theme of "actions", the sub-themes "systemic solutions", "personal actions and habits", "response efficacy" and "barriers" were communal with the first section. The unique sub-themes under the main theme “action” were “individual action”, “response knowledge and uncertainty”, “benefits” and “politics”. The third interview part, denoted climate change and public discourse, include the five unique themes of “personal media habits”, “media focus”, “negative framing”, “media quality” and “want information”. It should be noted, however, that “media and public discourse” appeared as a subtheme already in the first part of the interview.

Thematically, section one of the interview was the most diverse and open section. As a result, this section ended up containing the greatest number and most varied set of themes. The overarching purpose of this section was to explore the participants’ general thoughts and attitudes regarding the issue of climate change and to explore their perceptions of the risks associated with climate change. At the start of this section, the participants were asked to freely associate regarding climate change, which allowed for a wide range of different and open-ended answers. The following questions of the first interview section explored the

perceived consequences of climate change and how the participants viewed the risks of climate change and how the issue might affect them personally.

Table 5

Overview of main themes and sub-themes across the three parts of the interview.

Part 1		Part 2		Part 3	
Risk aspects	General consequences				
	Personal consequences				
	Personal safety and distance				
	Nature and wildlife				
	Uncertainty				
Salience	Urgency				
	Thinking and worrying about it				
	Media/ public discourse				
Personal stance	Pessimism				
	Optimism				
	Ambivalence				
	Responsibility				
	Politics				
Social context	Public awareness	**Social context**		**Social context**	
	Social norms		Social norms		Social norms and public attitudes
	Social influence		Social influence		Social influence
Actions	Systemic solutions	**Actions**	Systemic solutions		
	Personal actions and habits		Personal actions and habits		
	Barriers		Barriers		
	Response efficacy/ helplessness		Response efficacy		
			Individual actions		
			Response knowledge and uncertainty		
			Benefits		
			Politics		
				Media	Personal media habits
					Media focus
					Negative framing
					Media quality
					Want information

As the main theme of "risk aspects" illustrated, there was a tendency among the participants to be more worried about more general, global consequences of climate change rather than consequences that might affect the participants personally. For several participants, there appeared to be a certain ambivalence in the sense that they viewed climate change as a very serious and threatening phenomenon in general, but nevertheless felt personally sheltered from it, as highlighted under the sub-theme of "personal safety and distance". Numerous participants also specifically highlighted the consequences that climate change might have for non-human parts of nature, such as other animal species and ecosystems. Even though most of them expressed feeling personally sheltered from the worst consequences, they still revealed that they thought and worried a lot about the issue of climate change, suggesting that they experienced the issue as salient and important. Several of the participants expressed a feeling of urgency regarding the need to tackle the issue of climate change immediately. There was also a notable expression of pessimism among most of the participants when it came to answers regarding how the global community will meet international climate goals.

The second section of the interview guide was thematically more specific and less open-ended compared to the first section. Consequently, it ended up having a smaller and less varied set of themes compared to the first section. The main focus of the second interview section was to explore the participants' thoughts concerning climate mitigation behaviors and solutions, and to examine the views they experienced in their social circles. One feature that emerged in the second section across several interviews (main theme "actions") was the view that systemic solutions would be necessary in order to successfully tackle climate change. Many participants argued that individual actions would not be enough or a very successful way to combat climate change, though a minority of the participants still expressed that they thought that individual lifestyle changes were important and effective. Furthermore, another prominent feature among the participants was the feeling of frustration that it was difficult to know which actions are effective when it comes to mitigating climate change, as was captured under the sub-theme of "response knowledge and uncertainty".

The third section was the briefest and most specific of the three interview sections. This section asked the participants about where they get information concerning climate change and their perceptions of how the issue is covered in the media and talked about in the public conversation. Here it should be noted that "media" seemed to mean occasional glimpses of online news and social media content to many of the respondents, not the vast

coverage of news or information usually indicated by the term. The participants experienced the media coverage of the issue somewhat differently, with some of the participants holding a more positive view of the way the issue is covered whereas others were more critical. However, there was a common theme which showed that many of the participants felt there was an overly negative framing in the way the issue is covered in the media, with many of the participants describing that the media often focuses on dramatic aspects of the issue or presents doomsday scenarios.

Discussion

The main aim of this study was to elucidate the following research question: how do students perceive the risks associated with climate change? In addition to this, it was also of interest to investigate how they perceived their own capability to ameliorate the problem, and the consequences climate change will have for their futures. The study also wanted to explore how the participants experienced the way that the issue of climate change is discussed publicly, such as in the media, in order to gain potential insights into how the issue of climate change can be communicated effectively. The following section will discuss the most central findings of this study and how they may be interpreted. The commonalities and differences in themes between the different parts of the interview will also be considered, as well as possible reasons for the overlap and differences. Implications and limitations of the study will also be discussed.

Overall, the interviews provided useful insights into how the participants perceived the issue and the role that it played in their lives. One obvious limitation of the study is its small sample size (15 respondents), and it is neither possible nor an aim of the study to be able to generalize the results by the statistical standards used in large quantitative studies. Instead, the aim has been to gather rich, detailed information from this particular group of participants about how they perceived the risks of climate change. Qualitative studies are not about generalization, but aim at in-depth, situated knowledge where characteristics of both participants and context matters and influence the analyze and discussion of the empiric material. As Johannessen, Tufte and Christoffersen (2010) state, qualitative studies are about meaning-making, understanding the participants interpretations of specific phenomena and topics. In this respect, the study may identify factors that were relevant for this particular group. The sample, consisting of university students from NTNU, is a rather homogenous group that is not representative for the general population as a whole. Furthermore, the participants of the study were recruited voluntarily from lectures and university cafes. It is possible that people who have a greater interest and personal engagement with the issue of climate change are more likely to volunteer for such a study. As Malterud (2017) argues, it is important to take into account the factors that characterize the sample and how this affects the transferability—that is, the extent to which findings may be transferred to other contexts or settings. The findings of this study will likely be most valid for the student population of Norway, especially those that take some interest in the issue of climate change.

There were also strengths to the design that add to the transferability and reliability. There was an almost even balance of both genders included in this study, which makes the results more robust, even though the purpose of the study was not to make comparisons between the genders. Likewise, as described in the method chapter, participants were recruited from both the Campus for Natural Sciences and Technology and the Campus for Social Sciences and Humanities in order to ensure a wider range of perspectives. While the sample size of the study does not allow for making generalizable comparisons of the two groups, recruiting from the two campuses and different study backgrounds did provide a greater breadth in the perspectives of the respondents. For example, students from technology disciplines appeared to contribute more answers related to the technological aspects of climate mitigation, natural science students brought unique perspectives related to the intersection between climate change and biology or physics, and psychology students provided insights related to how psychology and behavior affect the issue. Since the respondents contributed unique perspectives depending on their backgrounds, a potentially interesting follow-up study would have been to carry out the interviews of this study in a group setting, such as with focus groups. This would have made it possible to see how these themes play out in a social context and would potentially have made it possible to explore potential group differences between the two campuses in greater detail.

Parts of the material were coded along with a second coder in order to compare the codes and themes that were generated, to assess inter-rater reliability. There was a substantial overlap in the codes and themes generated by the two coders, and the inter-rater reliability was therefore subjectively judged to be high, suggesting that similar analyses might have been generated if they were carried out by another researcher. Throughout the coding of the material, I have revisited the data material multiple times in order to assess whether the themes that were generated accurately reflected the actual statements of the participants to make sure that the analysis was grounded in the data.

As outlined in the Method and Result sections, the interviews of this study were analyzed according to the three different parts of the interview, which resulted in a separate set of themes for each of the parts of the interviews. The resulting themes for the three interview parts ended up containing some communal and some unique themes. These similarities and differences, as well as possible explanations for them, will be discussed in the following. The differences in themes between the sets were largely a reflection of the different topics that the interview questions of each part were meant to explore. But despite the different overarching themes of each section of the interview, the participants often

contributed long and complex answers which touched on different topics and moved from one theme to another within the same answer, and as a result of this, there ended up being several similarities in terms of the themes of the different parts of the interview. In many instances participants would anticipate topics that were asked about in later sections of the interview, which contributed to the degree of overlap between the different parts of the interview. As an example, when asked to freely associate about climate change in the first interview section, several of the participants reflected around personal actions that they were doing or commented on the role of the media, which were topics that would later be explored by the interview questions in part two and three, respectively. Similarly, in the first part of the interview, many spontaneously described the actions that they personally carry out to mitigate climate change or talked more generally about measures they thought could or should be done to combat the issue. These were topics that were asked more specifically about in the second part of the interview, and consequently there ended up being a fair bit of overlap between the first and second parts of the interview in the themes related to "actions" as well. However, there were some nuances in the way the topics were talked about as well. In the second part of the interview, some of the questions specifically concerned actions, and consequently the topic was talked about in a wider range of ways compared to the first part of the interview, where the participants brought up this topic more spontaneously. This is seen through the number of sub-themes, which reflects how the theme of "actions" was talked about in a wider range of ways in the second part of the interview. As an example, in the second part of the interview, the participants talked more about the individual actions they thought that people in general can do in order to combat climate change, which is reflected in the sub-theme of "individual actions". They also talked more about the topic of knowledge and uncertainty concerning mitigation behaviors in the second part of the interview compared to the first part, which is reflected in the sub-theme of "response knowledge and uncertainty". In some other cases there were also some thematic similarities between different parts of the interview that nevertheless ended up being represented through different themes for the different sections. As an example, in the first section of the interview the main theme of "salience" included answers related to the media coverage of the issue, which was captured under the sub-theme "media / public discourse". In contrast, in the third part of the interview the topic of "media" was a main theme of its own. The reason for this is that the topic of media coverage was discussed in somewhat different ways in the two parts of the interviews. In the first part of the interview, many participants mentioned how they thought a lot about the issue or felt that the issue of climate change was particularly salient due to how much the

issue is covered in the media or how prominent it is in the public conversation. Because the topic was talked about in this particular context, it was decided that it would be an appropriate sub-theme of the main theme "salience", as there seemed to be a relationship between the two topics in the first part of the interview. In the third part of the interview the questions specifically concerned the media, and consequently the participants ended up talking about the media in a wider range of ways compared to the first part of the interview. As a result, "media" ended up being a main theme of its own in this part of the interview, with a set of sub-themes to illustrate the more varied ways in which the topic was talked about in this part of the interview.

As outlined in the result section, some of the key findings of this study was the perceived salience of the issue; the uncertainty that many felt with respect to the consequences of climate change, information concerning the issue and the effects of mitigating behaviors; and the ambivalence that many described between their concern for the risks of climate change in contrast with the sense of safety or (geographical or temporal) distance that many simultaneously experienced. These findings will here be discussed in light of previous research. As mentioned in the summary of the results, most of the respondents who participated in this study described that the issue of climate change was a salient topic for them. While a few of them answered that they did not think that much about the topic, the majority of respondents described thinking about the issue a lot, and many of them suggested that they often worried about it and viewed the issue as important. Several of them also described a consciousness or awareness of the issue in their social groups. Overall, this would suggest that climate change was a very salient topic for the participants. In this respect, the respondents in this study would appear to be in line with general trends in society, where the issue of climate change has received a lot of attention in the public discourse. As described previously in the thesis, recent years have seen notable climate protests and uprisings among young people, both in Norway and abroad. In 2019, students marched in more than 100 countries to protest governments' inaction with regard to climate change (*News at a glance*, 2019). As the European Commission's regular reports on public opinion in the European Union show, climate change is one of the most frequently mentioned concerns among citizens in Europe, being ranked as the most mentioned national concern in several Northern European countries such as Sweden, Denmark, Germany and the Netherlands (European Commission, 2019). Similarly, opinion polling in Norway has indicated that climate change is a common concern, with the age group 18–29 being the most likely to be worried about the issue (Mørtvedt et al. , 2019). Since this present study relied on the voluntary participation of

interested subjects, it is possible that the study attracted respondents who are particularly concerned about the climate change issue. However, as the previously described opinion polls illustrate, climate change is a widespread concern, both in Europe as a whole and in Norway, suggesting that the issue is salient for the general population as well. In this respect, the experiences of the participants when it comes to the salience of climate change may well be common among young people in Norway today. Indeed, for many of the participants, one of the reasons that climate change was such a salient issue for them was precisely because it holds such a prominent place in the public conversation, the media coverage and among their social peers, suggesting that the experience of the respondents was influenced by the salience of the issue within the culture as a whole.

Another prominent, related feature in the interviews was the particular aspects of the climate issue that the respondents tended to find salient. As noted, most of them did not describe feeling personally vulnerable to a great extent or very concerned about the personal consequences of the issue. Instead, they more frequently mentioned more global consequences, such as negative consequences for people in other parts of the world or negative consequences for non-human species and ecosystems. In this respect, their concern regarding the issue often appeared to be of a more intellectual kind rather than viewing it as an immediate threat to themselves. This phenomenon of viewing climate change more as a distant threat has also been noted by previous research, as outlined in the theory section, with some researchers referring to the phenomenon as the *psychological distance* of climate change (Spence et al., 2012). According to Spence et al. (2012), there is a tendency for people, at least in the Western world, to see climate change as distant both in terms of time (with negative effects occurring some unknown time in the future), in terms its social impact (with the greatest impacts for people who are unlike ourselves, such as people in poorer nations), and in terms of its geographical impact (mostly affecting people in geographically distant places). When people see a threat as being future or distant, there is a tendency for them to undervalue the associated risks (Gifford, 2011). Moreover, people tend to clearly distinguish between personal and societal impacts of climate change, where the personal risks of climate change are judged to be lower than societal risks. This phenomenon has been found in studies with respondents from Britain and the United States (Spence et al., 2012). This tendency to highlight the societal risks of climate more than the personal risks appeared to be a very central feature also in this present study, which may suggest that this phenomenon might also be relevant when it comes to how young people in Norway perceive the risks of climate change. In the experiments of Spence et al. (2012), they found that a

greater feeling of psychological distance was related to a lower degree of climate change concern and vice versa, suggesting that this phenomenon might be of importance when it comes to climate change communication and motivating adaptive behavior. However, interventions aimed at increasing the perceived proximity of climate change have yielded mixed results (Brügge, 2015; Schuldt, 2018), suggesting that the effects of perceived distance and proximity of climate change are complex. In this present study, many of the respondents did express great concern about the issue even if they did not feel very personally vulnerable to the risks of climate change. This would suggest that other aspects than personal risk were salient enough to elicit substantial concern and engagement among them, leading them to view the issue as important and urgent.

In the interviews, some potential factors were identified that appeared to motivate the respondents to be concerned about climate change. Many mentioned the consequences for wildlife and other species as one of the things that they thought about the most or were most worried about, and many also mentioned such topics when they were asked to freely associate concerning the issue of climate change, suggesting that these topics were especially salient and vivid for many of them. As Roeser (2012) has argued, one reason that many people in the Western world do not feel a strong sense of urgency with respect to climate change is because most people lack vivid, concrete and personally relevant affective images of climate change. Instead, people tend to look at the issue in abstract terms, which prevents them from becoming emotionally engaged with the issue. Indeed, few or none of the respondents in the interviews described personally relevant affective images of climate change in the sense of having experienced effects of climate change first-hand. This may be part of the reason why few of them described being very concerned about the potential personal consequences of climate change. However, while they did not tend to mention personal first-hand experiences with the effects of climate change, several of them mentioned watching nature documentaries which showcased the effects of climate change on other animal species. As an example, one participant mentioned that images of ice bears were an immediate, vivid association when thinking about climate change. Several others similarly mentioned being moved or affected by nature documentaries or news about the consequences for animals. In this respect, this may represent an example of how concrete, vivid affective images may motivate people to be concerned about climate change. This may allow people to see the issue in less abstract, more emotionally salient terms. This type of emotional engagement may in turn be important for motivating a sense of urgency and will to action (Roeser, 2012).

With respect to the salience of the issue of climate change, it is important to note that some time has passed since the interviews were carried out. The interviews were done throughout 2019. Throughout 2020, both the media coverage and public consciousness has been dominated by the coronavirus. In contrast, a significant decline in the amount of media coverage of climate change was observed during this period (Nacu-Schmidt et al., 2020). Hence, it is possible that the results would have been different if the interviews had been carried out today. In a media environment where most of the focus has been on the pandemic, it is possible that the issue of climate change would not have been equally salient today. Moreover, the coronavirus itself represents a significant risk on a societal and personal level, a threat with a more immediate time frame compared to climate change. Therefore, it is possible that the current situation might affect how people regard the risks of climate change, acting as a point of comparison.

One of the other key themes of the interviews was the sense of uncertainty that the respondents described in different areas. Many expressed uncertainty concerning the nature of the consequences of climate change, and many were also uncertain about which actions they could take in order to effectively mitigate the problem or the extent to which such mitigating behaviors have any real effect. Furthermore, many of them also felt that it was difficult to know how to find reliable and constructive information regarding the things that a person can do to mitigate climate change or to know which information to trust. Sometimes this combined sense of uncertainty about how to get information and whether their actions had a positive effect appeared to result in a sense of helplessness. Such a feeling of helplessness may potentially act as a barrier keeping people from engaging in mitigating behaviors. According to Gifford (2011), "[u]ncertainty about climate change also quite likely functions as a justification for inaction or postponed action related to climate change" (p. 292). Moreover, experimental research on resource dilemmas has demonstrated that both perceived and real uncertainty reduce the frequency of pro-environmental behavior (de Kwaadsteniet, 2007). For instance, uncertainty about the size of a resource pool or the rate at which a resource regenerates may be interpreted by people as a sufficient reason to harvest at a rate that favors self-interest rather than the environment (Gifford, 2011). This type of uncertainty is especially relevant when it comes to climate change, because uncertainty will necessarily be a major feature of the issue. Climate change involves an uncertain set of consequences that are projected to arrive at an uncertain point in the future, involving a complex set of causal mechanisms that are hard to account for in any exact manner. As Budescu et al. (2009) found in an experimental study, when people read the statements of the

Intergovernmental Panel on Climate Change (IPCC), their understanding and judgment of probability terms often deviate significantly from the scientists, "which may lead to underestimation of the problems being discussed" (p. 306). This illustrates the challenges that scientists face when it comes to communicating uncertainty. The interviews in this study add further support to the role of the challenges posed by uncertainty in climate change communication, as the sense of uncertainty concerning content as well the reliability of climate change information was a common feature among the respondents. Some of the participants also mentioned the confusion elicited by the sometimes mixed messages in the media coverage of the issue, something that has been noted by previous research as a possible contributor to people's feeling of uncertainty regarding the issue (Gifford, 2011).

There are reasons to believe that the type of uncertainty that the respondents expressed may be relevant as a predictor of whether people are willing to engage in mitigating behaviors. Uncertainty is relevant to several of the applied psychology theories of health promotion and injury prevention described by Beatson and McLennan (2011), which were outlined in the theory section. As an example, within theory of planned behavior (TPB), outcome beliefs are conceptualized as having a direct influence on your intentions to carry out given behaviors. Outcome beliefs concern "the perceived likelihood of a given outcome resulting from a particular behavior" (Beatson & McLennan, 2011, p. 174). Furthermore, the extended parallel process model (EPPM) predicts that when in cases where people perceive a threat to be great but are uncertain or pessimistic about their own capability to effectively mitigate the threat, this may lead to maladaptive fear-control reactions, such as avoidance, denial, hopelessness, wishful thinking or fatalism (Witte, 1992). Likewise, the terror management health model (TMHM) suggests that reminders of a threat can both elicit adaptive and maladaptive behavioral responses, and that adaptive responses are more likely to occur when people feel that they have been presented with compelling and clear evidence of the likely effectiveness of the recommended behaviors, meaning that the perceived *response efficacy* is high (Beatson & McLennan, 2011). In the interviews of this study, it appeared as though many experienced a feeling of uncertainty precisely concerning the likelihood of a given outcome resulting from various pro-environmental behaviors, in other words suggesting that their sense of response efficacy was low. It appeared as if even many of the respondents who expressed a great concern about the climate issue and a desire to contribute positively to mitigating the issue still felt a sense of uncertainty with respect to the efficacy of mitigating behaviors. In this light, it is possible that interventions aimed at increasing people's sense of response efficacy—i.e., their beliefs concerning the efficacy of

mitigation behaviors—might be an effective way of increasing the motivation to engage in mitigation behaviors, but more research is needed in this area. There has, however, been some recent research that has shown promising signs in this respect. In an experimental study, Salomon et al. (2017) found that beliefs and messages about the efficacy of climate change mitigation behaviors affects whether people see personal energy conservation as a moral issue, which in turn mediated intentions and actions. Participants who read messages stating that their behavior made no impact reported a higher energy consumption one week later compared to participants who had read messages suggesting that their individual behaviors made an impact. The findings of this thesis support the notion that efficacy beliefs concerning climate mitigation may be an especially important area to target when it comes to encouraging individual climate change adaptation.

Conclusion

The aim of this study has been to shed light on how students in Norway perceive the risks of climate change and their own capacity to ameliorate the problem. The results suggest that climate change was a salient issue for the respondents, and many of them thought about the issue a lot and considered it to be an important global threat. At the same time, there was a tendency to be more concerned about the global or societal risks of climate change rather than potential personal risks of climate change, and many described feeling sheltered from the negative consequences of the issue or feeling a sense of distance in space and time from the negative effects. Feelings of uncertainty were also common among the respondents: uncertainty concerning the potential consequences of climate change, uncertainty concerning how to get reliable information about the issue, and uncertainty concerning the effects of mitigation behaviors. It is notable that even many of the respondents who described themselves as concerned about and engaged with the issue still expressed pessimism regarding the usefulness and efficacy of individual climate change mitigation behaviors. This finding has implications for further research and for public awareness campaigns or interventions that want to encourage individual climate change mitigation and lifestyle changes. Previous research (Gifford 2011; Salomon et al., 2017) has suggested that people's beliefs about the impact or efficacy of mitigation behaviors may be an important barrier to individual climate change adaptation, and this thesis adds supports to this suggestion. The findings of this study suggest that messages targeting people's beliefs concerning the impact of mitigation behaviors may be an especially important area for public awareness campaigns

aimed at encouraging individual climate change adaptation. Increasing people's sense of proximity or personal susceptibility to the consequences of climate change may similarly be an especially important area of focus.

The respondents of this study were well-informed people who, by virtue of being university students, have access to a lot of knowledge and information. Even so, many of them felt unsure whether their actions really matter in the big picture when it comes to climate change. As described in the theory section of this thesis, some previous research (Kellstedt, 2008) has suggested that people who are more informed about climate change tend to be less concerned about the issue and feel less responsible for it. While most of the respondents in this thesis did appear to be concerned about the issue and felt a sense of personal responsibility and motivation to mitigate the issue, they also tended to feel a sense of personal safety from the consequences and uncertainty concerning their own capacity to mitigate the issue. This suggests that the relationship between knowledge and concern when it comes to climate change is complex and that even well-informed people can experience a fundamental sense of uncertainty in the face an issue as large and complex as climate change.

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Appendix

Appendix A: Interview guide

Appendix B: Letter concerning study information and consent

Appendix A: Interview guide

Intervjuguide

Tema	Spørsmål	Oppfølginger
Introduksjon	(Gjennomgang av info-skriv, med informasjon om frivillighet, anonymitet, og at deltagere kan trekke seg når som helst.) Jeg tenkte vi kunne begynne med å snakke litt generelt om klimaforandringer.	
DEL 1 Risikoopplevelse/konsekvenser ved klima	Kan du fortelle meg litt om hva du tenker når du hører begrepet klimaforandringer? Hva tenker du om fremtidige endringer i samfunnet knyttet til klimaforandringer? Hvordan ser du på klimaforandringene sin betydning for din egen fremtid?	Forklar hva du forbinder med det, hvordan du forstår det, klargjøre holdninger til fenomenet.
	Er det noen konsekvenser du er spesielt bekymret for? Kan du fortelle litt om disse?	Er det noe du frykter vil påvirke fremtiden din? Tenker du at det utgjør en risiko for deg personlig, eller først og fremst andre?
	Er potensiell risiko eller negative konsekvenser fra klimaforandringer noe du tenker på til daglig?	Hvor ofte? Evt. sammenlignet med andre potensielle trusler?
	FN har som klimamål at verden skal begrense temperaturøkningen til to grader. Hva tenker du om muligheten for at verden når dette målet?	Hvordan/hvorfor ikke? Hva skal til? Hva kan hindre det? (Teknologioptimisme? Politisk endring?)

DEL 2 Mestringstro/barrierer for adferdsendring	Nå tenkte jeg at vi kan snakke litt om dine tanker om hva man kan gjøre for å hindre eller redusere klimaendringer.	
	Hva tenker du folk kan gjøre for å motvirke klimaendringer?	Muligheter inkluderer: Engasjere seg politisk, resirkulering, kollektivtransport, sykle, minske strømforbruk, forbrukervalg.
	Gjør du selv noe for å motvirke klimaendringer?	Hvilke? Hvorfor?
	I hvilken grad opplever du at folk i din omgangskrets (også) er opptatt å gjøre klima/miljøbevisste valg?	Noe som snakkes om? Viktig å signalisere, eller holde for seg selv? Sosialt press?
	(Hvis de forteller at de er opptatt av å gjøre miljøvennlige adferder...) Hvorfor tenker du at folk burde gjøre ting for å motvirke klimaendringer?	Muligheter inkluderer: Bekymring? Hjelpe andre? Pliktfølelse? Sosiale normer?
	Kan du komme på noen ulemper ved å ta miljøvennlige valg eller ting som gjør det mindre attraktivt?	Muligheter: Tid, penger, upraktisk, sosiale normer.
	Hva med fordeler eller positive sider ved å ta miljøvennlige valg?	
	I hvilken grad føler du at det hjelper å gjøre noe for klima? Det vil si, at valgene dine har noe å si eller har noen effekt?	Påvirker disse vurderingene hvilke valg du tar?
DEL 3 Klimakommunikasjon	I den siste delen av intervjuet tenkte jeg at vi kunne snakke litt om hvordan klimasaken kommuniseres og diskuteres.	
	Kan du fortelle litt om hvor du oftest får informasjon om klimaendringer?	Muligheter: Media, venner, internett, skole/utdanning. Hvor ofte møter du slik informasjon?

	Kan du fortelle litt om hvordan du opplever (medie)dekningen av klimasaken? Har du noen tanker om hvordan klimasaken kan kommuniseres mer effektivt? Er det noen informasjon du savner eller skulle ønske det var mer av?	Informativ? For mye fokus på den ene eller andre siden? Katastrofepreg? Forskjell på ulike kilder? Gjøres mer aktuell/relevant?
Konklusjon	Takk for at du tok deg tid til å være med i undersøkelsen min i dag. Det har hjulpet meg med å få et innblikk i hvordan du opplever klimasaken. For å oppsummere, så har du fortalt at (gi kort oppsummering), er det noe mer du ønsker å tilføye?	

Appendix B: Letter concerning study information and consent

NTNU
Fakultet for samfunns- og utdanningsvitenskap
Institutt for psykologi

Trondheim, 29.04.2019

Vil du delta i forskningsprosjektet

" Alvorlige klimaendringer – opplevd risiko og konsekvenser for egen fremtid"?

Prosjektets formål:

Hensikten med studien er å få kunnskap om studenter sine opplevelser av risiko ved klimaforandringer, konsekvenser for egen fremtid, og opplevelse av egen evne til å påvirke klimasituasjonen.

Hvem er ansvarlig for forskningsprosjektet?

NTNU er ansvarlig for prosjektet.

Forskningsmetode:

Intervju av ca. 12 studenter med ca. lik kjønnsbalanse.

Intervjuet vil ta omlag 45 minutter til 1 time.

Det er frivillig å delta
Det er frivillig å delta i prosjektet. Hvis du velger å delta, kan du når som helst trekke samtykke tilbake uten å oppgi noen grunn. Alle opplysninger om deg vil da bli anonymisert. Det vil ikke ha noen negative konsekvenser for deg hvis du ikke vil delta eller senere velger å trekke deg.

Behandling av data og personvern:

Vi vil bare bruke opplysningene om deg til formålene vi har fortalt om i dette skrivet. Vi behandler opplysningene konfidensielt og i samsvar med personvernregelverket. Forskningsdataene vil bare bli behandlet av meg og min veileder som forskningsansvarlig. Personopplysninger: **kun informasjon om kjønn og campus-tilhørighet vil bli etterspurt.** Deltakere vil ikke kunne gjenkjennes i publikasjon.

Bruk av data:
Forskningsprosjektet vil bli dokumentert og publisert i min hovedoppgave, og vil kunne være tilgjengelig for informanter etter prosjektets slutt/hovedoppgavens godkjennelse.

Dine rettigheter
Hvis du kan identifiseres i datamaterialet, har du rett til:

- innsyn i hvilke personopplysninger som er registrert om deg,
- å få rettet personopplysninger om deg,
- få slettet personopplysninger om deg,
- få utlevert en kopi av dine personopplysninger (dataportabilitet), og
- å sende klage til personvernombudet eller Datatilsynet om behandlingen av dine personopplysninger.
- Kontaktinformasjon til personvernombud ved NTNU: thomas.helgesen@ntnu.no

Hva gir oss rett til å behandle personopplysninger om deg?
Vi behandler opplysninger om deg basert på ditt samtykke.

På oppdrag fra NTNU har NSD – Norsk senter for forskningsdata AS vurdert at behandlingen av personopplysninger i dette prosjektet er i samsvar med personvernregelverket.

Med hilsen

Jakob Saur

Psykologistudent

Institutt for psykologi

NTNU, 7491 Trondheim

jakobsau@ntnu.no

Telefon: 41 65 70 88

Informasjon om samtykke til å delta i intervjuet

Jeg har mottatt informasjon om studien "Alvorlige klimaendringer – opplevd risiko og konsekvenser for egen fremtid" og ønsker å stille til intervju. Jeg er kjent med studiens formål, og at jeg når som helst kan trekke meg i prosessen frem til hovedoppgavens godkjennelse. Jeg vet at opplysningene jeg gir vil bli behandlet uten kobling til meg som person i publisering av forskningsresultater. Jeg er klar over at det er frivillig å delta og jeg kan trekke meg så lenge studien pågår uten at jeg må oppgi grunn.

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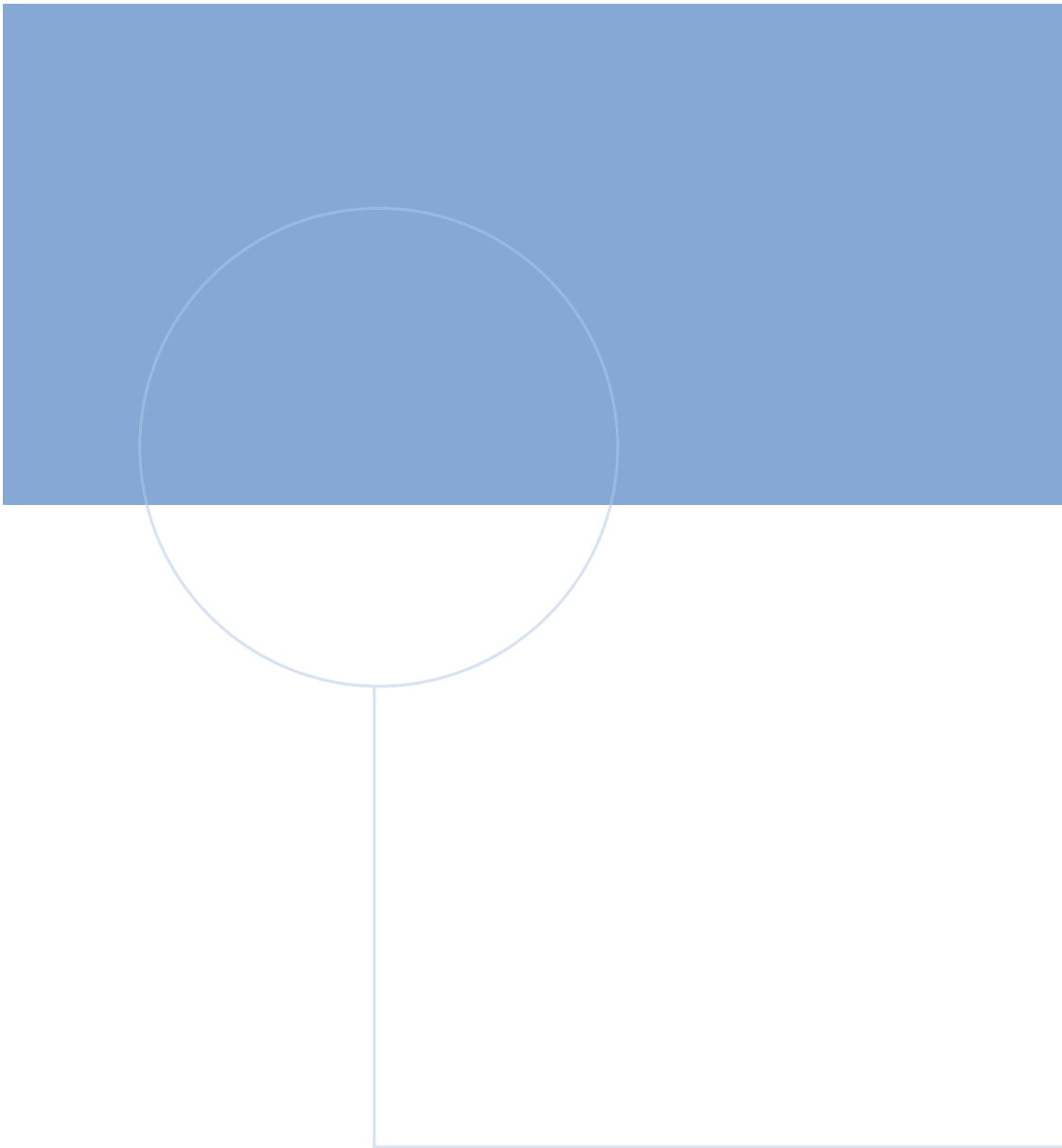

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