"Last week I was on a climate march in New York"

The discrepancy between environmental concern and pro-environmental behaviour within the millennial generation

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Abstract

Objectives: The objectives of this research are to uncover the perceptions and behaviours of young millennials regarding climate change.

Method: To realize these objectives 25 semi-structured individual interviews have been conducted delving deeper into the millennials' perceptions of climate change and their pro-environmental behaviour. These interviews included 25 millennial participants from different educational backgrounds in the Netherlands.

Results: The results of this research show that millennials are highly concerned about climate change. On the one hand, parts of the sample translated their environmental concern into active pro-environmental behaviour, due to the fact that they were aware of their individual contribution to climate change. On the other hand, the remaining sample hardly behaved pro-environmental, while emphasizing that their individual contribution to mitigate climate change is of little importance.

Conclusions: In conclusion, the awareness of millennials regarding their individual contribution to climate change and a high degree of knowledge about sustainable action could serve as an indicator for engaging in pro-environmental behaviour. Conversely, the unawareness of causing harm to the environment and restricted knowledge about environmentally-friendly actions results in little to no pro-environmental behaviour in members of the millennial generation.

Implications: Among another implication for the Dutch government, this study particularly emphasizes the urgency to engage millennials in more pro-environmental behaviour in their private space. For that purpose, information campaigns providing millennials with concrete examples of pro-environmental behaviour could make them aware of their individual contribution to climate change, which eventually could provoke them to engage in more pro-environmental behaviour.

Keywords: millennial generation, climate change perceptions, pro-environmental behaviour

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1. Introduction

During recent years, the effects of climate change on planet earth have become increasingly apparent. Through the overuse of the planet's resources, the earth is gradually warming up, which has far-reaching effects on the ecosystem, as for instance the extinction of multiple species (Ceballos et al., 2015). Furthermore, humankind is confronted with a multitude of other interrelated challenges connected to climate change. Therefore, in order to counteract global warming, the Paris Climate Agreements have been signed by 196 states in 2015. As a result, all countries that signed the agreement launched their individual climate goals in order to keep global warming below the threshold of 2 degrees Celsius. Nonetheless, the United States of America, as the major producer of carbon dioxide (Fitzgerald, Schor, & Jorgenson, 2018), already resigned from the Paris Climate Agreement and their political leader holds the point of view that climate change is a hoax. On the European continent, efforts to mitigate climate change have also been decelerated and climate goals are far away from being reached (Hölsgens, 2019; Müller et al., 2019). This also applies to the Netherlands.

The Netherlands is one of the countries that are most endangered by global warming. The reason for that is that the Netherlands is a low-lying country, with most of its area located below sea level. Since global warming results in melting polar caps, which, in turn, make the sea level rise (Nicholls, & Cazenave, 2010), parts the Netherlands are likely to be flooded in the future. This has also been supported by the Dutch Environmental Assessment Agency (2013) that warns of possible floods induced by climate change with associated risks, as for instance the loss of living area and contaminated drinking water.

Consequently, it appears likely that the Dutch population would be highly concerned about the climate. However, according to a study by Lorenzoni and Pidgeon (2006), investigating the public views on climate change in the US and Europe, the Dutch are the least climate concerned population in the EU. Nonetheless, considering that the research has been published 13 years ago this perception might have changed. Specifically, the young birth cohort of millennials, which has not been studied by Lorenzo and Pidgeon in 2006 might hold a different opinion about climate change.

This generational cohort, which is historically positioned in an exceptional time span, is the first generation that has grown up in a digitalized world, with vast amounts of information, also concerning climate change, just one-click away (Twenge, Campbell, Hoffman, & Lance, 2010). Over the course of their early lives and given the amount of information they have been exposed to, they have been confronted with the presence of climate change and the possible negative implications it could have on their future lives (Heo & Muralidharan, 2019). More specifically, when negative implications of climate change are expected to become more severe in the years to come, members of this generation will be asked to cope with the effects and consequently handle them as well (Gray, Raimi, Wilson, & Árvai, 2019). By that time, this generation, which has been identified to be more concerned with the climate than other age groups (Special Eurobarometer 372. Climate change. European Commission, 2011), will be the politicians and people of influence. Therefore, they are the generation that is most appropriate to

form current societal responses to climate change, which makes them particularly interesting as research subjects for this study. However, their voice in public discussion is least heard and valued compared to elder generations (Corner et al., 2015). Consequently, it appears reasonable to, in the scope of this research, thoroughly investigate the millennial generation's perceptions of climate change. Thereby, this research paper aims at giving voice to the millennial generation's perceptions of climate change in a scientific context.

Besides that, there are certain actions that millennials can undertake in the private space in order to benefit the environment. An example of these pro-environmental actions is the choice of an individual to for instance refrain from travelling by airplane and to instead journey by train in order to keep CO^2 emissions at a minimum. Performing these actions alone would offer comparably low benefits to the environment, whereas when performed by many people at the same time climate change could be mitigated (Stern, 2000). However, recent research suggests that despite their concerns about the climate, millennials fail to actively engage in behaviour that is beneficial to the environment (Heo & Muralidharan, 2019). This could potentially serve as an indicator of cognitive dissonance regarding climate change within the millennial generation. Therefore, and also considering the previous paragraph, the following research question has been established.

"What are the perceptions and behaviours of millennials regarding climate change?"

Findings from this research could serve as a starting point to make the millennial perceptions of climate change tangible, which, in turn, could be utilized by the Dutch government to understand the concerns of its young voters and incorporate them into their political decision making.

Lastly, given that insights of this study would reinforce that millennials are concerned about the climate but do not engage in pro-environmental behaviour (Heo & Muralidharan, 2019), communication professionals could utilize this research as a foundation for communication campaigns targeting the millennial generation. More specifically, these campaigns could aim at involving millennials into more pro-environmental behaviour in their private space in order to mitigate climate change.

2. Theoretical framework

Climate change is a topic that is increasingly troubling not only the academic community but everybody aware of it. It is a widely-discussed topic which has been disregarded and disagreed upon and has sparked various opinions along the years by different professionals. Even though various definitions of climate change have been given, it can be described as a gradual change in systematic weather phenomena, caused by negligent actions, such as the burn of fossil fuels, destroying rainforests and farming livestock (Weber, 2010). However, even though climate change is an extensively reviewed topic there is little research connecting it with younger people and looking into their perspectives towards it.

In the following sections, literature concerning the millennial generation will be introduced. Afterwards, an overview of pro-environmental behaviour, which can be performed in an individual's private space will be contextualized. Lastly, the millennial generation and their pro-environmental behaviour will be presented.

2.1. Millennial generation

There are various assumptions regarding the millennial generation, however, misconceptions arise to the chronological span they belong to. Scientific literature revolving around generational differences does not exactly define, who can be classified as a member of the millennial generation. According to Myers and Sadaghiani (2010), Millennials are defined as individuals born between 1979 and 1994, whereas other scientific publications allocate millennials to the birth cohorts of 1982 to 1999 (Twenge, Campbell, Hoffman, & Lance, 2010). Consequently, there is no clear scientific consensus on where the millennial birth cohort can be allocated and therefore, for this research, individuals born between 1994 and 2000 are considered as millennials.

Generally, the millennial generation is known for their technological savviness, their focus on individualism and their need for supervision (Twenge & Campbell, 2008). Millennials are the very first generation having grown with the internet providing them with unlimited access to an unlimited amount of information. Moreover, they are considered a highly dominant (Debevec, Schewe, Madden, & Diamond, 2013) and impressionable generation (Pomarici & Vecchio, 2014; Wray-Lake et al., 2010), which can seriously affect the way they view the information they read online and to a greater extent their views on the environment. Even though the internet can be a valuable tool to broaden one's knowledge, it can also produce false ideas as it is open for everyone to express their opinions (Xiong & Zuo, 2019). Although 90% of climate scientists agree upon the existence of climate change, there is still a striking 10% which shows a clear decrease in the recognition of those beliefs (Lewandowsky, Oberauer &Gignac, 2013). Additionally, internet blogs have become a source of denial and rejection of climate change which has seriously affected millennials perceptions of it (Lewandowsky, Oberauer & Gignac, 2013). Therefore, given that a great amount of information one can read online is a hoax, millennials trust towards online statements has increasingly dropped.

With a view on the millennial generation's relationship with the internet, as well the fact that they constitute future politicians and people of influence, there is little to no research connecting millennials to climate change. Millennials are the generation whose lives converge most closely with future policies regarding global warming (Corner et al., 2015). As such they are the best placed to define societal responses to mitigate climate change (Gray, Raimi, Wilson, & Árvai, 2019). However, they are equally vulnerable to and affected by the choices made by previous generations (Corner et al., 2015). Even though millennials will be the most affected by climate change they are also the ones that are the least heard and valued in public debate and political scenes (Corner et al., 2015). Surveys suggest that millennials are equally, if not more, concerned about climate change as previous generations, however, it does not constitute a top-rated priority among young people (Special Eurobarometer 372. Climate change. European Commission, 2011). The millennial perceptions of climate change depend on two factors, first their distrust in political figures and estrangement from mainstream politics (Harris, Wyn, & Younes, 2010) and second, their knowledge around global warming (Corner et al., 2015). Millennials are aware of climate change but lack significant information and there is ambivalence around core scientific concepts (Schreiner, Henriksen, & Kirkeby Hansen, 2005). In other words, millennials know that climate change exists but have wrong perceptions about factors that cause global warming.

In conclusion, millennials are a tech-savvy generation, which is well positioned to form societal responses towards climate change. Nonetheless, public discussion about global warming pays little attention to their generational climate concerns. Moreover, regardless of their access to an unlimited amount of information through the internet and their awareness of climate change, millennials still lack information about which factors cause global warming.

2.2. Pro-environmental behaviour

Environmental behaviour has been defined as actions that are performed by an individual with the objective of changing the environment (Stern, 2000). Pro-environmental behaviour can, therefore, be regarded as actions undertaken by an individual with the objective to benefit the environment. In other words, a behaviour that aims at leaving a small ecological footprint on planet earth (Steg & Vlek, 2009).

Since this research scopes at investigating the pro-environmental behaviours of members of the millennial generation, it appears reasonable to discuss in this chapter which pro-environmental behaviour can be exerted in the private space of an individual. That is also particularly interesting because sustainable behaviour exerted in day to day life has direct implications on the environment (Stern, 2000).

Even though these implications are comparably small, they can sum up to considerably high beneficial impacts on the environment given that pro-environmental behaviour is exerted by vast amounts of individuals in the private space (Stern, 2000). As an example, a single individual that decides to refrain from using the airplane as a means of transportation and instead uses the train would cause a thoroughly small benefit to the environment. Whereas, if the majority of people would decide to do the

same, the environment would benefit to a great extent, since fewer resources would be needed to be withdrawn from earth (Hüttel, Ziesemer, Peyer, & Balderjahn, 2018).

2.2.1. Categories of pro-environmental behaviour.

Nonetheless, pro-environmental behaviour cannot solely be identified in an individual's selection of transportation means but also incorporates six other categories of environmentally friendly behaviour, which have been conceptualized by Derckx in 2015. Besides transportation, she identified the use of water, electricity, food, materials, waste and biodiversity as the building blocks of pro-environmental behaviour in the private space (Derckx, 2015). These seven categories of environmentally friendly behaviour can easily be performed by an individual on a daily basis and will be briefly explained in the following.

(1) Water relates to the careful use of water in everyday life (Derckx, 2015). Examples of pro-environmental behaviour in this regard include using less water for showering and making the laundry less frequently. (2) Transportation refers to the selection of environmentally friendly means of transportation (Derckx, 2015). Examples of pro-environmental behaviour in that context include choosing the bike and public transportation over the car. (3) Electricity includes the careful use of electricity in the household (Derckx, 2015). Examples of pro-environmental behaviour in the use of electricity are the use of energy-saving lamps or the decision to wear an extra sweater over using the heater when it is cold outside. (4) Food incorporates an individual's decision for sustainable nutrition (Derckx, 2015). Examples of pro-environmental behaviour in that regard are eating less meat or no meat at all and buying local groceries over imported products. (5) Materials include the use of renewable materials over non-renewable materials (Derckx, 2015). Examples of pro-environmental behaviour in that regard are the use of cotton bags over plastic bags and the use of wooden straws over plastic straws. (6) Waste refers to the avoidance of trash and the reutilisation of these materials (Derckx, 2015). Examples of pro-environmental behaviour in that regard are purchasing products without packaging as well as recycling. (7) Biodiversity comprises taking care of natural ecosystems and supporting their continued existence (Derckx, 2015). Examples of pro-environmental behaviour in that regard are planting trees and feeding animals in winter.

Behaving environmentally friendly in these seven categories would lower the demand for new products, which in turn would save resources to be withdrawn from the earth. As a result, that would avoid combustion gasses to be released into the atmosphere, which could decrease the progress of climate change (Vieux, Darmon, Touazi, & Soler, 2012). Conversely, showing no pro-environmental behaviour in none of the seven categories would increase the demand of resources and production of new goods, which in turn would increase emissions and thus accelerate climate change (Hüttel, Ziesemer, Peyer, & Balderjahn, 2018). Therefore, these factors of pro-environmental behaviour by Derckx (2015) can be utilized in the context of this research in order to explain to what extent pro-environmental behaviour is being exerted by the research subjects. Performing behaviour in all

categories would consequently signalise very high pro-environmental behaviour by an individual, whereas performing behaviour in no categories would signalise no pro-environmental behaviour.

2.2.2. Barriers to pro-environmental behaviour.

Even though it might seem relatively easy to exert pro-environmental behaviour in the above-mentioned categories, many people fail to do so since the emissions caused by private households are continuously increasing (Hafner, Elmes, & Read, 2019). That could be attributed to certain factors hindering individuals to behave pro-environmentally in the private space. These factors will be elaborated in the following.

In an early study by Kollmuss and Agyeman (2002) barriers to pro-environmental behaviour have been studied. Among others, four important factors inhibiting pro-environmental behaviour have been identified by the two researchers. First, a lack of knowledge of environmentally friendly actions has been proven to be a barrier to pro-environmental behaviour (Kollmuss & Agyeman, 2002). More specifically, a person that does not know what he or she can do in terms of sustainability is very likely to show little to no pro-environmental behaviour. Second, missing internal incentives have been identified to inhibit environmental behaviour as well (Kollmuss & Agyeman, 2002). In other words, people that do not perceive pro-environmental behaviour as a necessity to for instance improve their quality of life are less inclined to behave environmentally friendly. Third, insufficient feedback about environmental behaviour has shown to be another barrier to pro-environmentalism (Kollmuss & Agyeman, 2002). So, people that do not receive feedback on their sufficiency of pro-environmental behaviour, are less likely to perform sustainable action. Lastly, old behavioural patterns have also been found to compromise the pro-environmental behaviour of individuals (Kollmuss & Agyeman, 2002). That means people that caused harm to the environment in the past are more inclined to show similar behaviour in the future.

The latter factor, namely old behavioural patterns, has also been included in a more recent study by Hafner, Elemes and Read (2019), who also conducted research on barriers to pro-environmentalism. In their research, old behavioural patterns are summarized under the term habit. Additionally, they found five other aspects that could both encourage as well as decline pro-environmental behaviour. These aspects are action inertia, social norms, emotion, perceived behavioural control and delay discounting (Hafner, Elmes, & Read, 2019). In the context of this research, the barriers to pro-environmental behaviour by Kollmuss and Agyeman (2002) as well as Hafner, Elmes and Read (2019) could be utilized to explain, why certain forms of pro-environmental behaviour are not being exerted by the research subjects.

In conclusion, there are seven categories of pro-environmental behaviour that can be relatively easy performed in the private sphere of individuals. These forms of pro-environmental behaviour contribute to fewer emissions being ejected into the atmosphere and, therefore, counteract global warming and climate change, specifically when performed by multiple individuals at the same time

(Stern, 200). Nonetheless, certain barriers to this particular behaviour remain, which could inhibit individuals to behave pro-environmentally and thus harm the environment.

2.3. Millennials and pro-environmental behaviour

As outlined in the previous paragraph, there is a multitude of pro-environmental actions, which are relatively easy to undertake in the private space of an individual. Nonetheless, since emissions caused by private households are gradually increasing during recent years (Hafner, Elmes, & Read, 2019), it is clear that certain individuals fail to behave pro-environmentally. This also includes parts of the millennial generation.

Millennial individuals that are worried about the planet's future actively engage in behaviour that is beneficial to the climate, whereas generational members not worried about the well-being of the earth miss out to do so (Hanks, Odom, Roedl, & Blevis, 2008). However, the aforementioned study dates back 11 years in time and new insights regarding the millennials and their pro-environmental behaviour have been acquired during the last decade. Smith and Brower, in their study conducted in 2012, found that millennials actively engage in searching for sustainable goods, when they intend to purchase a new product. Furthermore, an increasing number of members of the millennial generation is currently adopting pro-environmental behaviour in food consumption (Bollani, Bonadonna, & Peira, 2019). Bollani, Bonadonna and Peira (2019) identified proportions of the millennial generation to actively eat less meat and buy locally produced food. Hence, even though millennials were quite inactive regarding sustainability and climate change they are gradually starting to show signs of interest.

Parts of the millennial generation, despite their concern about the climate, see little to no importance in adapting their personal consumption behaviour for the sake of the environment (Bollani, Bonadonna, & Peira, 2019). According to Schoolman, Shriberg, Schwimmer and Tysman (2014) millennial individuals primarily engage in recycling waste. Nevertheless, millennials are blind for other forms of pro-environmental behaviour, particularly in the use of materials, transportation means and the consumption of food (Schoolman et al., 2014). As the cause for this unawareness Schoolman et al. (2014) suggest a lacking environmental education at schools and universities. Corresponding to that are the findings of Fox et al. (2018), which also suggest that millennials are thoroughly worried about the climate and overuse of resources but do not acknowledge their own contribution in enhancing the phenomenon. Moreover, they demand action to mitigate climate change from politics and companies but lack the appropriate knowledge of how to behave pro-environmentally themselves and, thus, miss out to do so (Hill & Lee, 2013). Resulting from environmental concern and little pro-environmental behaviour Heo and Muralidharan (2019) suggest that within the millennial generation cognitive dissonance is inevitable. Cognitive dissonance has been defined by Festinger (1962) as a state of conflicting attitudes and behaviours, which is unpleasant to the affected individual and raises the desire to reduce that dissonance. According to Dickerson et al. (1992), the desire to reduce cognitive dissonance can be utilized to engage an individual into more pro-environmental behaviour. More

specifically, they argue that by providing students with practical examples of how to behave sustainably, it encourages them to behave more pro-environmentally friendly and, thereby, cognitive dissonance could be reduced. Therefore, Sogari, Pucci, Aquilani and Zanni (2017), as well as Allen and Spialek (2017), suggest that social media, as a source of information frequently used by millennials, could be utilized as a tool to provide this generation with knowledge on how to behave more sustainably.

In conclusion, parts of the millennial generation are currently moving towards behaving more sustainably. However, other members of that generational cohort fail to engage in adequate pro-environmental behaviour due to missing knowledge, which could result in an unpleasant state of cognitive dissonance. This cognitive dissonance could be reduced by means of providing millennials with concrete examples of pro-environmental behaviour by means of social media.

3. Method

In order to investigate the perceptions and behaviours of the millennial generation regarding climate change, semi-structured individual interviews with members of this particular age group were conducted. Even though a quantitative approach might have been suitable to measure perceptions and behaviours as well, qualitative interviews allowed the researcher to grasp the context of the millennials' perceptions of climate change and according behaviour. Thereby, it enabled the researcher to make sense of why certain perceptions have formed and why certain millennials engage in or refrain from pro-environmental behaviour.

3.1. *Participants*

For this study, 25 participants were individually interviewed, from which 12 (48%) were male and 13 (52%) were female. The mean year of birth of the participants was 1997, ranging from the eldest participant having been born in 1994 and the youngest participants having been born in 2000. All participants were native Dutch speakers, had the Dutch nationality and lived in the Enschede region of the Netherlands. In addition to that, participants from different educational backgrounds were sampled. More specifically, eight participants followed university education (WO), nine participants attended higher vocational education (HBO) and eight participants followed intermediate vocational education (MBO).

The participant recruitment in this research was executed in a two-way approach. First, Dutch citizens from the researcher's personal network recruited eight participants out of their own personal networks. Second, the remaining 17 participants were sampled at the University of Twente, the Saxion Hogeschool and the ROC van Twente, all located in Enschede. Here the researcher approached individuals studying in the public spaces of the respective educational facilities in order to ask for their participation. In both approaches, purposive sampling has been applied solely including native-Dutch speaking, millennial participants with the willingness to share their perceptions of climate change. The

compliance of the participants to the inclusion criteria of this research was ensured by asking for their year of birth, their nationality as well as their willingness to share their perceptions of climate change. Given that the prospect participant's characteristics complied with the inclusion criteria and participation in the research was agreed upon, the interviews were conducted in a quiet setting free from external bias at the respective educational facilities and in an office building in Enschede.

3.1.1. Demographics

Table 1: Gender composition of the sample

Gender	Frequency	Percent
Male	12	48
Female	13	52
Total	25	100

Table 2: Age composition of the sample

Year of Birth	Frequency	Percent
1994	1	4
1995	3	12
1996	3	12
1997	4	16
1998	5	20
1999	5	20
2000	4	16
Total	25	100

Table 3: Educational background of the participants

Level of Education	Frequency	Percent
WO	8	32
HBO	9	36
MBO	8	32
Total	25	100

3.2. Interview protocol

The questions that were asked during the individual interviews were established based on the literature review regarding the millennial perceptions of climate change and their pro-environmental behaviour. In total, the interview protocol consisted of a set of 16 questions, which were discussed in each of the 25 sessions. However, since these 16 questions were open-ended, follow up questions were asked to the participants in order to make them elaborate their statements more in detail or to discuss other topics that emerged over the course of the interview.

Moreover, the interview protocol was directed at systematically exploring the research question. First, the participants' perceptions of climate change were assessed by a set of ten questions. These questions revolved around the participants' view on climate change and climate change neglecters, their view on climate activism, their future expectations with regard to climate change, their opinion about having children in times of climate change, their perceived responsibility for climate change and participation in public debate as well as whether or not they expect climate change to have implications on their daily lives. The questions can be found in Appendix B. Second, the participants' environmental behaviours were assessed by a set of six questions. These questions delved into the current environmental behaviours of the participants, their planned environmental behaviours as well as their knowledge about environmental behaviour. The questions can be found in Appendix C.

3.3. Procedure

Prior to the data collection, the researcher read out the informed consent form to the participant and questions that occurred were clarified. It was explained to the participant that he or she can withdraw from the interview at any given time without any consequences, that his or her responses will be fully anonymized and that there are no right or wrong answers. Despite that, for sustainability reasons a printed version of the consent form was renounced and, therefore, consent from the participant was gathered orally. Afterwards, the actual interview began.

Each interview was conducted in Dutch and started with general and open-ended questions on how the particular participant perceives climate change. As an example, the first questions of the interview protocol comprised: *"Recently it is written and spoken a lot about climate change. How do you view that?"* and *"What do you think about people that neglect climate change?".* These questions were designed in order to stimulate the participant to share his or her general perception of climate change.

Subsequently, the interviews revolved around other aspects such as the participants' perceptions of climate activists and their future expectations with regard to climate change. By means of asking these questions, it allowed the researcher to acquire a deeper understanding of the participant's perceptions of climate change. Eventually, the interviews moved to the pro-environmental behaviour of the participants. Questions regarding the pro-environmental behaviour of the participant were for example: *"What are you currently doing for a sustainable future?"* and *"What could be daily things*

normal citizens could do to contribute to a sustainable future?". Thereby, it was assessed how pro-environmentally active and informed about pro-environmental behaviour a certain participant was. When all the questions were clarified, the researcher signalized the termination of the interview session by thanking the participant for his or her participation.

An interview session took on average 15 minutes per participant, with the least extensive session lasting for about seven minutes and the most extensive session lasting about 40 minutes. For a further analysis of the participant's answers, the individual interviews were audio-recorded by means of an iPhone6s.

3.4. Data Analysis

The recordings from the individual interviews were transferred to an external hard drive and deleted from the initial recording device. Subsequently, the recordings were transcribed word by word as well as fully anonymized to ensure that no data can be traced back to the individual respondent. After transcription, the gathered data was exported to the qualitative data analysis software Atlas.ti in order to systematically investigate the participants' responses. More specifically, data analysis was executed in four steps.

First, the researcher familiarized himself with the transcripts in order to investigate, which codes could be utilized to make sense of the data. Second, inductive coding was applied to assess the data with regard to the research question as well as to eventually come up with a codebook draft. The aim of this inductive approach was to determine the sentiments of the participants' responses to the questions from the interview protocol as well as their degree of pro-environmental behaviour. Third, the reliability of this particular codebook draft was assessed by means of determining the intercoder reliability of two researchers that independently coded the same 10% of the transcripts in one coding sessions. More specifically, respectively 45 proportions of text deduced from three interviews were coded by each of the two researchers. Resulting from that, the intercoder reliability, or the level of agreement between both researchers, accounted a Cohen's Kappa of 0,76 for the respective proportions of text. In other words, there was a good level of agreement between both researchers. Hence, the codebook (Appendix C) was employed to code to remaining data. As the fourth and last step of the data analysis, the remaining 90% of the data was coded by one researcher.

4. Results

In this chapter, the results of the research project will be presented. First, the main findings regarding the millennial perception of climate change will be displayed. Second, the most significant results concerning the pro-environmental behaviour of the participants will be contextualized.

4.1. Perceptions of climate change

When asked about their point of view on climate change, a majority of 19 participants (76% of the sample) acknowledged that climate change exists and is an important challenge to society. This perception can be illustrated with the following statement from one of the participants: *"Climate change is something that we must consider in the close future. It is something that is already in progress and only going to turn out to be worse in the future."* (Participant 3). Corresponding to that are the negative sentiments of the interviewees towards climate change neglecters. More specifically, 20 participants (80% of the sample) disagreed with climate change neglecters emphasizing that they utilize neglection as a means to escape from reality: *"I find it very weird to neglect climate change because there is evidence that climate change really exists. I think that they try to escape climate change and that's why they neglect it."* (Participant 13). On the contrary, 20 participants (80% of the sample) held positive to ambiguous sentiments towards climate activists. The majority of these participants supported the missions of climate activism, however, a frequently mentioned point of disagreement with climate activists, was the sample's perception that climate activism tends to become too extreme: *"It is obviously good if they show their opinion and try to convince people, but some things can really go too far let's say*." (Participant 11). Still, climate activism was perceived as an enhancer of the public debate about climate change, as it can be observed in the following statement: *"The principle of climate activism is good. Look through that there has been a lot of attention [on climate change] during the last six months"* (Participant 9).

The overall perceptions of the sample regarding the millennial contribution to climate change debate were relatively negative. In total 6 (24%) of the 25 participants perceived no contribution of the millennial generation to the public debate and 11 (44%) were ambiguous about their contribution. These participants emphasized that they would neither be heard nor valued in public discussion or that they would be heard but not valued*:" In my opinion, the young people are kind of left aside (...) "* (Participant 23). Despite that, a demand for immediate action to mitigate climate change was expressed: *"There is a lot of debate about it also in the Tweede Kamer (...), but I think that according action should be undertaken as well."* (Participant 19). This immediate demand for action also relates to the sample's future expectations with regard to climate change.

4.1.1. Future expectations with regard to climate change

Due to the fact that none of the interviewees was positive about both the short-term and long-term future, the samples´ climate concerns were underlined. Moreover, yet again, participants emphasized that for

them to have a future ahead that is not affected by climate change, immediate action by the politics would be required: *"It depends if there is going to be a change before 2030. If this change comes then the earth can look very well. If there is going to be no change then the earth could look rather bad. Then we will be the last generation that has experienced normal weather conditions."* (Participant 5). Two participants even had such negative future expectations with regard to climate change that they expressed their concerns about not wanting children: *"If you see forecasts about how warm it is going to be and that it will be impossible to live here then I'm asking myself if I want to put my children in a world, where they cannot even grow up."* (Participant 18). The remaining majority of the sample that wished to have children in times of climate change expressed that they would raise their prospect children to become environmentally friendly *"If I am going to have children, I am going to make them well aware about what they are doing to nature."* (Participant 14). Despite these negative future expectations, the willingness to take responsibility for climate change within the sample was comparably low, with the majority of the sample perceiving themselves to be hardly or not at all responsible for climate change: *"I believe that one single person has little impact."* (Participant 5).

In conclusion, the results concerning the sample's perceptions regarding climate change indicate that climate change is a major concern of members of the millennial generation. Particularly, the majority of the sample acknowledged that climate change is a serious challenge to society, which resulted in negative future expectations with regard to climate change. However, the demand for immediate action by the government to mitigate climate change, the low willingness to take responsibility and the emphasis on raising prospect children environmentally friendly suggest that the participants overlooked their own personal contribution to a more sustainable future. That will be discussed in the following paragraph.

4.2. Pro-environmental behaviour

When questioned concerning their current contribution to a sustainable future, in order to find out what the millennial behaviours regarding climate change are, responses from the participants were rather diverse. Therefore, they have been categorized into distinct groups, based on their respective level of pro-environmental behaviour (PEB). These groups, inspired by the work of Derckx (2015) include very low PEB, low PEB, moderate PEB, high PEB as well as very high PEB. In the following, responses from participants with high and moderate PEB will be briefly reviewed. Afterwards, the responses of the interviewees with low and very low PEB will be delved into, in order to grasp why these individuals, miss out to contribute to a sustainable future by means of their behaviour.

4.2.1. High and moderate pro-environmental behaviour

To begin with, no participant showed a very high degree of PEB and only 3 participants (12% of the sample) provided a wide range of pro-environmental activities performed in the private space,

signalizing a high degree of PEB. High PEB in the sample included actions regarding nutrition, supporting biodiversity, using less materials, separating trash, being responsible with water and using sustainable means of transportation: *"I don't leave the heater on, I always use the bike, I never leave the light on, I eat less meat (...) and I use less paper because I have an e-reader (...), I separate the trash."* (Participant 1). Nonetheless, participants showing a high degree of PEB were the minority within the sample, whereas interviewees performing PEB on a moderate level were much more frequently represented. More specifically, the respective majority of 10 participants (40% of the sample) performed pro-environmental behaviour on a moderate level: *"I bike in any case (...) I pay attention to the use of plastic and at home, we separate trash. I also try to eat less meat."*- (Participant 13).

Most of the participants that showed a high or moderate level of PEB also emphasized their awareness of the necessity of behaving pro-environmentally in their private lives for the sake of the environment. Particularly, when asked about whether they perceive themselves to be responsible for climate change, answers were comparable to Participant 7: *"Because we are the youth, we are the ones that have to continue with this [climate change] and we have to take care of solutions. Now I'm a vegetarian myself and so I contribute through not eating meat."*. Lastly, it is noteworthy that a participant with moderate pro-environmental behaviour emphasized that she is actively adapting her behaviour to mitigate climate change as well*: "I feel very responsible for that [climate change] because I also adapt my own behaviour."* (Participant 14). Furthermore, when asked about her current pro-environmental behaviour she stated that she is using the plane as a means of transportation as seldom as possible: *"(...) I use the plane as little as possible."* (Participant 14). However, at the beginning of the interview session, when she was questioned concerning her view on climate change, her answer was the following: *"By coincidence, last week I was on a climate march in New York."* (Participant 14). That statement underlines that even though she was concerned about the climate, adapted her behaviour accordingly and showed an affiliation to climate activism, she blurred out the fact that she was contributing to increased emissions by flying to New York.

4.2.2. Low and very low pro-environmental behaviour

The remaining 12 participants (48% of the sample) showed low levels of PEB to no PEB at all. On the one hand, the interviewees that have been identified to perform low levels of PEB in their private lives accounted for 32% (n=8) of the total sample size. Even though all of them agreed upon the fact that climate change exists and is a serious challenge to mankind, they only performed pro-environmental activities in two of Derckx's (2015) seven categories of PEB. These activities included separating the trash and using public transportation: *"I predominantly recycle and separate the trash (...) and travel more by train than by car."* (Participant 11).

On the other hand, the remaining 4 participants (16% of the sample) showed a very low degree of PEB to no PEB at all. When asked about their current contribution to a sustainable future, answers solely revolved around separating the trash: *"The only thing I do is separating the trash and that was*

it." (Participant 10). Nonetheless, it is noteworthy that interviewees showing very low and low degrees of pro-environmental behaviour trivialized their actions. More specifically, they justified their low or very low PEB by means of emphasizing that their individual effect on the environment is comparably small: *"I can do nothing completely on my own, other people need to contribute as well. So, it does not have an effect, if I am going to do something alone. That is how I see it (...)."* (Participant 21).

Despite the downplaying of the personal behaviour in relation to climate change, participants that showed low or very low levels of PEB also underlined that instead of the individual, big companies should act to mitigate global warming. In their perception, these big companies were the polluters of the environment and enhancers of climate change, which would make them accountable to take measures against it: *"I think that something can be done about it [climate change], but I think that it [climate change] is more the fault of big companies than the one of the individual. Therefore, more companies need to change instead of that the individual necessarily has to separate the trash and stuff like that."* (Participant 4). Furthermore, they also underlined that despite their personal low or very low pro-environmental behaviour, they would raise their prospect children in a pro-environmental manner: *"I think that it is good, to make them aware [of pro-environmental behaviour] while they are young so that they can make better choices."* (Participant 11).

Lastly, it was also remarkable that most of the interviewees with either very low or low levels of PEB had moderate to low knowledge about how to behave pro-environmentally. However, they predominantly still perceived their contribution to a sustainable future as satisfactory. When asked whether in their perception they would contribute sufficiently to a sustainable future, answers were comparable to the following example: *"(...) I have the feeling that I contribute sufficiently. (...) I separate the trash actively and that helps the environment.* (Participant 12).

In conclusion, in terms of their pro-environmental behaviour, the sample was divided into two camps. On the one hand, a slight majority of participants behaved moderately or highly pro-environmentally, while being aware that the individual contribution by means of pro-environmental actions matters to mitigate climate change. On the other hand, a slight minority of the participants behaved lowly to very lowly pro-environmentally, while neglecting that individual pro-environmental behaviour is of importance. These participants rather searched for the responsibility to mitigate climate change in other people or big companies rather than themselves.

5. Discussion

5.1. Research question

The main objective of this research was to acquire deeper insights into the millennial generation's perception of climate change and their pro-environmental behaviour. To begin with, the vast majority of the participants (80% of the sample) acknowledged that climate change exists and is a serious challenge to humanity. Moreover, the sample was highly concerned about the climate, with none of the participants having positive both short-term and long-term future expectations with regard to global warming. Resulting from this environmental concern participants demanded immediate action by both the politics and companies in order to mitigate climate change. However, only a small proportion of the sample translated their environmental concern into high degrees of pro-environmental behaviour. The comparably biggest part of the sample engaged in moderate pro-environmental behaviour. Both of the aforementioned groups of individuals also recognized the importance of their own behaviour in mitigating climate change. On the contrary, approximately half of the sample size solely engaged in low, very low and no pro-environmental behaviour at all, while underlining that their personal contribution has little importance in mitigating climate change.

5.2. Theoretical contribution

This research resulted in findings, which extend the existing scientific literature concerning the millennial generation and their interaction with the societal challenge of climate change. To begin with, it can be argued that environmental concern with an according uncertainty about the future was present within the sample. In other words, the interviewed millennials of this research were worried about the environment and had negative future expectations with regard to climate change. Lewandowsky, Oberauer and Gignac (2013) argue that millennials perceive climate change as a hoax. However, insights from this study contradict their findings, while underlining that millennials are highly concerned about the climate and, in fact, perceive climate change neglecters as individuals that utilize neglection as a means to escape from reality.

Another relevant implication of this research regards the millennial participation in the public discussion concerning climate change. As Corner et al. (2015) argue that millennials are the least heard and valued generational cohort in public debate about climate change, this study expands their findings. In particular, responses from the majority of interviewees emphasized that millennials also perceive their concerns not to be taken seriously by the Dutch government. Hence, millennials are not only factually least heard valued in public discussion but also feel that their contribution to public debate is not being considered.

Furthermore, Hanks et al. (2008) found that millennials, which were concerned about the well-being of the earth actively engaged in pro-environmental behaviour, whereas unconcerned millennials missed out to do so. However, findings from this research solely partly agree with the insights of the study conducted by Hanks et al. (2008). More specifically, the whole sample was concerned about the

climate. However, only a small proportion of the sample engaged in high degrees of pro-environmental behaviour, whereas approximately every second participant solely showed low or very low degrees. Hence, it can be deduced from this qualitative study that environmental concern on its own cannot be regarded as the sole predictor of pro-environmental behaviour within the millennial generation. Therefore, barriers inhibiting the millennial pro-environmental behaviour must be underlying, which leads to the following implication of this research.

Kollmuss and Agyeman (2002) argue that missing knowledge on how to behave pro-environmentally makes individuals refrain from sustainable action. Findings from this research correspond to these insights. Particularly, it has shown that millennials with a high degree of observed pro-environmental behaviour also had a high level of knowledge with regards to pro-environmental actions. However, interviewees engaging in low or very low levels of pro-environmental behaviour merely had low to moderate knowledge of how to behave sustainably.

Other insights from this study, also correspond to the findings of Kolmuss and Agyeman (2002). They identified missing internal incentives to be another barrier to pro-environmental behaviour. In other words, a person that does not acknowledge a necessity to personally engage in sustainable action will miss out to do so. This present study agrees with these findings in the sense that millennials with low or very low pro-environmental behaviour perceived and individual's contribution as ineffective in mitigating climate change. Therefore, these particular interviewees did not feel the urge to adapt their own behaviour towards being more sustainable. Furthermore, Kolmuss's and Agyeman's (2002) findings can be extended since millennials with high and moderate levels of pro-environmental behaviour surfaced internal incentives for behaving in a sustainable manner.

Additionally, the results of this research cover the millennial pro-environmental behaviour in terms of nutrition. As Bollani, Bonadonna and Peira (2019) observed an increase in millennials eating less meat in order to protect the environment, this research paper had similar findings. More specifically, this qualitative study has shown that millennials with high and moderate degrees of pro-environmental behaviour consciously chose to consume less meat in their private lives for the sake of the environment.

Lastly, the final implication of this research relates to the interviewees with low and very low degrees of pro-environmental behaviour. Schoolman et al. (2014) have revealed that members of the millennial birth cohort recycle waste while omitting to engage in other sustainable activities. This study agrees with these findings since participants with a low degree of pro-environmental behaviour solely recycled waste, while not engaging in other sustainable activities.

5.3. Practical recommendations

In practice, this research could serve as food for thoughts for communication professionals that aim at engaging millennials into more sustainable behaviour. They should take into consideration that certain millennials, despite their concerns about global warming, solely engage in low to very low pro-environmental behaviour and perceive an individual's contribution of little importance in mitigating

climate change. These individuals also lack knowledge of how to behave sustainably. Therefore, prospect communication campaigns should aim at conveying a message to the millennial generation that emphasizes that their individual contribution is effective in mitigating climate change. Furthermore, these campaigns should provide millennials with a wide range of practical examples of which pro-environmental activities an individual can perform in the private space. It should also be highlighted that recycling waste is not enough in contributing to a sustainable future. As the communication channel to provide the millennial generation with the aforementioned information, social media should be utilized, since it is a source of information frequently accessed by the millennial generation (Sogari, Pucci, Aquilani, & Zanni, 2017; Allen & Spialek 2017). Thereby, members of the millennial birth cohort could potentially start reflecting on their current pro-environmental behaviour and eventually incorporate other sustainable actions into their daily lives, which could turn out to be beneficial for the environment.

The second practical recommendation resulting from this research includes the millennial generation's voice in public debate about climate change. As it has been underlined by the majority of the participants that they perceive their climate concerns to be disregarded by the Dutch politics, this study could serve as relevant information for the government to understand the climate concerns of the millennial generation. As current political decisions concerning climate change will affect the future of the millennials (Corner et al., 2015), Dutch politicians should acknowledge taking the concerns of their youngest voters into consideration in their political decision making.

5.4. Limitations

This research paper has three limitations, which will be outlined in the following. First, it is important to bear in mind that this present paper is a qualitative study with a relatively small sample size of 25 participants. Therefore, it is impossible to, based on the findings of this research, draw inferences on the whole millennial population. In order to test whether or not insights from this research are applicable to all members of the millennial birth cohort, a survey could be utilized. However, this is a suggestion for future research and will be discussed in the following section (see 5.5).

Second, it should be noted that this research was conducted in the Eastern part of the Netherlands, specifically in the city of Enschede. Enschede and the Eastern part of the Netherlands, however, are not as severely endangered by global warming as the West of the country, which is to a great extent located below sea level. Hence, it can be argued that the perceptions and behaviours regarding climate change deduced from this research could be deviating given that this study would be conducted in the Western Netherlands. Nonetheless, this is also a suggestion for upcoming research (see 5.5).

Third, this research was carried out in a way that solely members of the millennial generation were interviewed. Therefore, it was impossible to extract from the data if the millennial perceptions and

behaviours regarding climate change are unique to this particular generational cohort. However, yet again, that constitutes food for thought for future research (see 5.5).

5.5. Suggestions for future research

In the following, four directions for future research will be proposed, which could be valuable to delve deeper into the insights of this present study. First, quantitative research in the form of a survey could be conducted in the future in order to investigate whether findings from this research paper are generalizable to and representative of the whole millennial population. Results from this survey could potentially reinforce findings this research, which, in turn, would amplify the urge to involve millennials in more pro-environmental behaviour.

Second, this study could also be conducted in the Western part of the Netherlands in order to investigate whether or not being more endangered by global warming results in different perceptions and behaviours within the millennial generation. Third, individual interviews with members of other generational cohorts could be carried out with the overall objective of identifying differences and similarities among them and the millennial generation. Thereby, it could be revealed if findings of this present research are unique to the millennial generation.

Lastly, future research could thoroughly examine millennials with high levels of pro-environmental behaviour in order to reveal what affected a behavioural change in these individuals towards exerting more sustainable action than other generational members. In turn, these insights could be utilized to engage large numbers of millennials into high degrees of pro-environmental behaviour, which could show to be highly beneficial for the climate.

6. Conclusions

In conclusion, this research expands the literature on the millennial perceptions of climate change and pro-environmental behaviour. A valuable addition of this paper to scientific literature is that millennials are highly concerned about the climate and have negative future expectations with regards to climate change. However, the millennial generation is divided into two camps in terms of their pro-environmental behaviour. Whereas half of the sampled millennials translated their environmental concern into high to moderate pro-environmental behaviour, the remaining half solely engaged in low to very low degrees of sustainable action. Lastly, knowledge about pro-environmental behaviour and internal incentives to engage in sustainable actions can both encourage and diminish environmentally-friendly behaviour.

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Appendices

Appendix A (Study Log)

Research Questions

RQ 1: "What literature can be found on scientific online databases concerning the millennial generation?"

RQ 2: "What literature can be found on scientific online databases concerning pro-environmental behaviour?"

Criteria preferred materials

For this research, articles from peer-reviewed journals are preferred. These articles should be published in the English language during the last five years in order to ensure certain recency of included literature.

Selecting databases

The preferred database to withdraw articles from is Scopus. This database has been selected since it enables the researcher to thoroughly narrow down his search results. More specifically, Scopus has the advantage to opt-in and opt-out certain results based on the year of publication, the field of interest, the country of publication as well as the document type. Furthermore, Scopus is not a publication site as Elsevier but a search engine that grants access to a multitude of scientific publication platforms.

In conclusion, Scopus has been selected since it enables the researcher to opt-in and opt-out certain results and because it provides the researcher with a wide variety of articles from different publishers.

Table 1: Relevant terms

Concepts	**Related terms**	**Smaller terms**	**Broader terms**
Millennial generation	Generation Y, Generation Me	Students	Generations
Pro-environmental behaviour	Sustainable behaviour	Flying behaviour, purchasing behaviour	Behaviour

Table 2: Search actions

	Date	Database	Search action + search technique	Total hits
1	20.06.19	Scopus	"millennial generation"	598
2	20.06.19	Scopus	Limit to: Social sciences	280
3	20.06.19	Scopus	Limit to: publication year 2015-2019	153
4	20.06.19	Scopus	Limit to: articles	109
5	20.06.19	Scopus	Limit to: Publication stage final	103
6	20.06.19	Scopus	Limit to: English language	98
7	20.06.19	Scopus	Exclude: Human, Female, Male, Adult, Generations and humans	83
8	20.06.19	Scopus	Exclude; Generational differences and gender	75
9	20.06.19	Scopus	Exclude: Housing and Generation Y	69
10	20.06.19	Scopus	Limit to: Sustainability, travel behaviour and perception	13
11	20.06.19	Scopus	Exclude: travel behaviour	7
12	20.06.19	Scopus	Exclude: Architectural Design	3

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Reflection

When reflecting on the literature search for the purpose of this research it was important to keep in mind that the overall goal was to find sources regarding the millennial generation in relation to sustainable behaviour. By means of using Scopus, this goal was relatively easy to accomplish for me. More specifically, since Scopus enabled me to use a searching technique of opting-in and opting-out certain sources it was easy to find my way through the search terms and eventually end up with three relevant

sources to convey a part my theoretical framework. Moreover, I also did not deviate from the search term that I have initially used, I merely narrowed it down to sources relevant to the theoretical framework. The relevance and quality of the articles were assessed by means of their years of publication as well as how many times the particular article has been cited by peer researchers. Nonetheless, for the following search operation I could also include sources from other scientific disciplines as I only used sources from the area of social sciences. Thereby, it could enable me to take another perspective on the millennial generation with regards to sustainable behaviour, which could be enriching for another theoretical framework.

Appendix B (Interview protocol)

Question to assess perceptions

(1) De laatste tijd wordt er veel gesproken en geschreven over klimaatverandering. Hoe kijk je daar tegenaan?

(2) Wat vind je van mensen die klimaatverandering ontkennen?

(3) Hoe kijk je naar de toekomst van de aarde op de korte termijn?

(4) Hoe kijk je naar de toekomst van de aarde op de lange termijn?

(5) Hoe denk jij erover kinderen op de wereld te zetten?

(6) In hoeverre voel je jezelf verantwoordelijk voor de klimaatverandering?

(7) Heb je het gevoel dat de stem van je generatie voldoende wordt gehoord in de openbare discussie over klimaatverandering? Zo nee: Hoe komt dat?

(8) Wat denk je over klimaatactivisten?

(9) Wat dacht je over klimaatactivisten in het verleden?

(10) Denk je dat het allemaal goed komt? Zo ja hoezo? Zo nee hoezo?

Questions to assess behaviour

(1) Wat doe jij nu zelf voor een duurzame toekomst?

(2) Wat ben je van plan om te doen voor een duurzame toekomst?

(3) Heb je het gevoel dat je voldoende bijdraagt aan een duurzame toekomst?

(4) Als we samen aan een duurzamere toekomst zouden werken, hoe zou het leven er dan in jouw ogen uitzien?

(5) Denk je dat we onze levensstijl in de toekomst kunnen volhouden? Zo nee: wat voor veranderingen verwacht je?

(6) Wat zouden alledaagse dingen kunnen zijn die burgers kunnen doen om bij te dragen aan een duurzame toekomst?

Appendix C (Codebook)

1. Attitude

Code	Code name	Explanation	Example
1.1	Positive	The participant has a positive attitude towards the existence of man-made climate change.	The participant acknowledges that climate change exists and implies that climate change is a serious issue.
1.2	Negative	The participant has a negative attitude towards the existence of man-made climate change.	The participant neglects that climate change exists and implies that it is not a serious issue.
1.3	Neutral	The participant has a neutral attitude towards the existence of man-made climate change.	The participant does not know about climate change and its seriousness.
1.4	Ambiguous	The participant has an ambiguous attitude towards the existence of a man-made climate change.	The participant acknowledges that climate change exists but also implies that climate change is not a serious issue.

2. Climate change neglecters

Code	Code name	Explanation	Example
2.1	Positive	The participant has a positive attitude towards climate change neglecters.	The participant shares the impression that climate change does not exist and / or is not man-made.
2.2	Negative	The participant has a negative attitude towards climate change neglecters.	The participant disagrees with climate change neglecters.
2.3	Neutral	The participant has a neutral attitude towards climate change neglecters.	The participant neither agrees nor disagrees with climate change neglecters.
2.4	Ambiguous	The participant has an ambiguous attitude towards climate change neglecters.	The participant both agrees and disagrees with climate change neglecters points of views

3. Future expectations (short-term)

Code	Code name	Explanation	Example
3.1	Positive	The participant has a positive attitude towards the short-term future.	The participant views the near future positively and expects positive developments and / or no effects of climate change.
3.2	Negative	The participant has a negative attitude towards the short-term future.	The participant views the near future negatively and expects negative developments and / or effects of climate change.
3.3	Neutral	The participant has a neutral attitude towards the short-term future.	The participant views the near future neutrally and expects neither negative nor positive developments as well as no negative and no positive effects of climate change.
3.4	Ambiguous	The participant has an ambiguous attitude towards the short-term future.	The participant views the near future positively and negatively at the same time and expects both positive and negative developments as well as positive and negative effects of climate change.

4. Future expectations (long-term)

Code	Code name	Explanation	Example
4.1	Positive	The participant has a positive attitude towards the long-term future.	The participant views the far future positively and expects positive developments and / or no effects of climate change.
4.2	Negative	The participant has a negative attitude towards the long-term future.	The participant views the far future negatively and expects negative developments and / or effects of climate change.
4.3	Neutral	The participant has a neutral attitude towards the long-term future.	The participant views the far future neutrally and expects neither negative nor positive developments as well as no negative and no positive effects of climate change.
4.4	Ambiguous	The participant has an ambiguous attitude towards the long-term future.	The participant views the far future positively and negatively at the same time and expects both positive and negative developments as well as positive and negative effects of climate change.

5. Having children in the future

Code	Code name	Explanation	Example
5.1	Positive	The participant has a positive attitude towards having children.	The participant considers having children in the future and climate change has no effect on that wish.
5.2	Negative	The participant has a negative attitude towards having children.	The participant considers not having children in the future due to climate change.
5.3	Neutral	The participant has a neutral attitude towards having children.	The participant did not consider having children yet.
5.4	Ambiguous	The participant has an ambiguous attitude towards having children.	The participant considers both options simultaneously.

6. Public debate

Code	Code name	Explanation	Example
6.1	Positive	The participant has a positive attitude towards the millennial participation in public debate.	The participant perceives the voice of his or her generation to be heard and appreciated in the public debate about climate.
6.2	Negative	The participant has a negative attitude towards the millennial participation in public debate.	The participant perceives the voice of his or her generation not to be heard and not appreciated in the public debate about climate change.
6.3	Neutral	The participant has a neutral attitude towards the millennial participation in public debate.	The participant has no opinion about whether or not the voice of his generation is heard or appreciated in the public debate about climate change.
6.4	Ambiguous	The participant has an ambiguous attitude towards the millennial participation in public debate.	The participant perceives the voice of his generation to be heard but not appreciated in the public debate about climate change.

7. Climate activists

Code	Code name	Explanation	Example
7.1	Positive	The participant has a positive attitude towards climate activists.	The participant appreciates the existence of climate activists and supports their claims/their mission.
7.2	Negative	The participant has a negative attitude towards climate activists.	The participant depreciates the existence of climate activists and does not support their claims / their mission.
7.3	Neutral	The participant has a neutral attitude towards climate activists.	The participant does not have an opinion about climate activists.
7.4	Ambiguous	The participant has an ambiguous attitude towards climate activists.	The participant supports climate activists in some of their activities but also depreciates other activities of them.

8. Responsibility

Code	Code name	Explanation	Example
8.1	High	The participant feels highly responsible for contributing to climate change.	The participant emphasizes that he or she feels highly responsible for contributing to climate change.
8.2	Moderate	The participant feels moderately responsible for contributing to climate change.	The participant emphasizes that he or she feels responsible for contributing to climate change but only to a moderate extent.
8.3	Low	The participant feels little responsibility for contributing to climate change.	The participant emphasizes that he or she feels responsible for contributing to climate change but only to a low extent.
8.4	Not at all	The participant does not at all feel responsible for climate change and blames the responsibility on others.	The participant emphasizes that he or she feels not at all responsible for contributing to climate change.

9. Current pro-environmental behaviour

Code	Code name	Explanation	Example
9.1	Very high	The participant is very highly pro-environmentally active.	The participant exerts pro-environmental behaviour in the use of water, transportation, electricity, food, materials, waste and biodiversity.
9.2	High	The participant is highly pro-environmentally active	The participant exerts pro-environmental behaviour in five to six of the above-mentioned sectors.
9.3	Moderate	The participant is moderately pro-environmentally active.	The participant exerts pro-environmental behaviour in three to four of the above-mentioned sectors.
9.4	Low	The participant is lowly pro-environmentally active.	The participant exerts pro-environmental behaviour in two of the above-mentioned sectors.

9.5	Very low	The participant is very lowly pro-environmentally active.	The participant exerts pro-environmental behaviour in one of the above-mentioned sectors.
9.6	Not at all	The participant is not at all pro-environmentally active.	The participant exerts no pro-environmental behaviour at all, in none of the seven sectors.

10. Planned pro-environmental behaviour

Code	Code name	Explanation	Example
10.1	Very high	The participant plans to become very highly pro-environmentally active.	The participant plans to exert pro-environmental behaviour in the use of water, transportation, electricity, food, materials, waste and biodiversity.
10.2	High	The participant plan to become highly pro-environmentally active	The participant plans to exert pro-environmental behaviour in five to six of the above-mentioned sectors.
10.3	Moderate	The participant plans to become moderately pro-environmentally active.	The participant plans to exert pro-environmental behaviour in three to four of the above-mentioned sectors.
10.4	Low	The participant plans to become lowly pro-environmentally active.	The participant plans to exert pro-environmental behaviour in two of the above-mentioned sectors.
10.5	Very low	The participant plans to become very lowly pro-environmentally active.	The participant plans to exert pro-environmental behaviour in one of the

			above-mentioned sectors.
10.6	Not at all	The participant plans to become not at all pro-environmentally active.	The participant plans to exert no pro-environmental behaviour at all, in none of the seven sectors.

11. Perceived sufficiency of pro environmental behaviour

Code	Code name	Explanation	Example
11.1	Positive	The participant has a positive attitude towards the sufficiency of his/her pro-environmental behaviour.	The participant perceives that he or she is contributing sufficiently to a sustainable future.
11.2	Negative	The participant has a negative attitude towards the sufficiency of his/her pro-environmental behaviour.	The participant does not perceive that he or she is contributing sufficiently to a more sustainable future.
11.3	Neutral	The participant has a neutral attitude towards the sufficiency of his/her pro-environmental behaviour.	The participant does not have an opinion about his or her contribution to a sustainable future.
11.4	Ambiguous	The participant has an ambiguous attitude towards the sufficiency of his/her pro-environmental behaviour.	The participant perceives his or her contribution to a sustainable future as sufficient and insufficient at the same time.

12. Knowledge about pro-environmental behaviour

Code	Code name	Explanation	Example
12.1	Very high	The participant has a very high knowledge of pro-environmental behaviour.	The participant knows of pro-environmental behaviour in the use of water, transportation, electricity, food, materials, waste and biodiversity.
12.2	High	The participant has a high knowledge of pro-environmental behaviour.	The participant knows of pro-environmental behaviour in five to six of the above-mentioned sectors.
12.3	Moderate	The participant has a moderate knowledge of pro-environmental behaviour.	The participant knows of pro-environmental behaviour in three to four of the above-mentioned sectors.
12.4	Low	The participant has a low knowledge of pro-environmental behaviour.	The participant knows of pro-environmental behaviour in two of the above-mentioned sectors.
12.5	Very low	The participant has a very low knowledge of pro-environmental behaviour.	The participant knows of pro-environmental behaviour in one of the above-mentioned sectors.

12.6	Not at all	The participant has no knowledge at all of pro-environmental behaviour.	The participant knows of no pro-environmental behaviour at all, in none of the seven sectors.