13 Public Engagement with Climate Change: Interdisciplinary Challenges
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Swiss Association for Geographic Education (VGDch)

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13.1

The role of trust for climate change mitigation and adaptation behaviour: a meta-analysis

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Choosing between different mitigation and adaptation behaviours can be a complex cognitive task, especially when knowledge of climate change is low. Trusting experts can help to alleviate the cognitive complexity of evaluating behavioural decisions due to serving as a heuristic in decision making. Gaining a deeper understanding of how trust in certain actors influences individuals’ mitigation and adaptation behaviours is, therefore, key. We present results of a meta-analysis that examines the role of trust in institutions, scientists, industry, environmental groups and people in general, in relation to different mitigation and adaptation behaviours. By drawing on data from 53 studies conducted in over 21 different countries, we find that trust in scientists and environmental groups is strongly associated with mitigation and adaptation behaviours. Conversely, this association is weak for individuals’ trust in institutions and industry, while it is negligible for general trust measures. We discuss the implications that these findings have for climate scientists and how experts could potentially increase trust levels to foster engagement in mitigation and adaptation behaviours.

In a second study, we explored (among other factors) how trust in the Swiss government and in climate scientists influences participation in the Fridays for Future climate strikes in Switzerland with a sample (\(N = 638\)) of university students. We find that trust in the Swiss government to act on climate change decreases the likelihood of participation, while trust in climate scientists to provide correct information on climate change increases the likelihood of participation. We explore and discuss determinants of large-scale collective action on climate change.
13.2
To strike or not to strike?
Motivations of young people in Switzerland to (not) participate in climate strikes

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Since the first climate strikes in December 2018, ten thousands of students across multiple Swiss cities regularly stepped out of schools, demanding the declaration of climate emergency and climate justice. Accompanied by remarkable amounts of media attention and controversial discussions among the public, the climate strike movement received encouragement from political and scientific communities. However, relatively little is known about potential drivers and dynamics of this new form of collective engagement for climate change, as well as how it is perceived by adolescents and young adults.

To explore individual motivations for participating – or not – in climate strikes and to examine speculations of the media and public discourse about them, two online-surveys with closed- and open-ended questions were conducted in February and May-August 2019. Answers from a total of 6’605 (study 1: N=888; study 2: N=5’717) students (14 - 25 years) of which ca. 44% and 33% respectively participated in the strikes were analysed using a mixed-methods approach.

Preliminary results show that the majority of strikers was motivated for participation by concerns about the environment and humanity, by the urgency and severity of climate change, and by the aim to foster action among the public and politicians. The most prominent reasons for not participating in the strikes were the fear of negative consequences due to absence in school or at work and the belief that participating would be hypocritical without acting in a climate-friendly way in everyday-life.
13.3

Climate change concern among adolescents - a matter of perceived distance?

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Effective climate change education and communication strategies need to take into account people’s perceptions and beliefs. A root difficulty is that the general public tends to perceive climate change as a psychologically distant phenomenon - something that, if at all, happens not here, not now, and not to oneself. This may make it difficult to imagine its impact and seriousness and consequently, the perceived personal relevance and concern about the issue may be low. Lack of concern is problematic because concern is a key factor for triggering climate action. However, previous studies examining distance perceptions and concern about climate change have almost exclusively focussed on samples of the general public made up of adults. Thus, little is known about how psychologically distant or close climate change is perceived by a highly relevant and so far overlooked population segment: adolescents.

In this study, we explored Swiss adolescents’ \( N = 587, 14 – 17 \) years) perceptions of psychological distance to climate change risks and how it relates to their concerns about it. Based on a closed-ended questionnaire conducted in October and November 2018, we used multiple linear regression models to reveal linkages between risk perceptions and climate change concern. Furthermore, latent profile analysis allowed for a classification of the students with regard to patterns of similar distance perceptions.

Our findings show that adolescents perceived climate change to be a certain and present risk. However, they perceived climate change to rather affect other places and other people more than themselves. Regression analysis revealed a significant inverse relationship between distance and concern: respondents who felt psychologically closer to the phenomenon expressed greater concern. In addition, we identified four distinct perception types which also differed with regard to their level of concern about climate change. The findings contribute to the understanding of how young people perceive climate change, which should assist in designing education and communication strategies to make it more salient for individual engagement.
13.4 «Expedition 2 Grad» – A climate change experience in Virtual Reality at Great Aletsch glacier: Implementation, exhibition success and first results from the evaluation

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Climate change has become a major topic in various media channels and is important for the general public and in Swiss politics. Young people started activism all over Switzerland with “climate strikes”, the recently launched “Gletscherinitiative” is about to be submitted and the Federal Council now aims for a climate-neutral Switzerland by 2050. The general interest in the topic of climate change is high and further increasing.

Our SNF Agora project “The 2°C target in the Alps – An Experience in Virtual Reality” also known as «Expedition 2 Grad» (http://www.expedition2grad.ch/) is placed within this field of interest. The main objective of «Expedition 2 Grad» is to make the production and the consequences of climate change tangible in virtual reality (VR) and to offer tools to rethink and re-imagine society’s relation to nature. At a tablet-station and with a VR-headset visitors undertake an expedition around the Great Aletsch glacier and interactively experience the effects of increasing temperatures on the alpine environment since the 19th century. John Tyndall, a 19th century English physicist, mountaineer and a pioneer in climate science, accompanies the users on their expedition. He acts as a storyteller and explains the very basic concept of how humanity got to a point where it could influence the global climate. Tyndall takes the users on a journey through time watching the retreat of the glacier until 2100 when most of its mass will have disappeared. Throughout this journey through space and time, emotions are triggered and the users experience the region of Aletsch through the eyes of their grandparents and of future generations.

This VR-experience with tablet station and VR-headset is open to all museum visitors. However, the main target audience of the project are school classes of Secondary and Gymnasium level (12-17 years). Our approach is to combine emotional involvement with a space for debate about the causes and possible actions to take. School classes get involved in such reflective debates thanks to the accompanying pedagogical program offered by the partner museums. A key point is a final discussion guided by experts. It aims to show the participants different ways of action and to motivate them to take responsibility for an own contribution in solving the climate problem. The audience should not leave with a guilty conscience, but should become aware that an individual can inspire others by own actions, that one can find alternative solutions with like-minded people and that collectively organized, one can influence politicians and decision-makers.
An important additional component is the pedagogical evaluation by a web-based questionnaire in which the users of the VR-experience answer several questions, to test aspect of the VR-experience (e.g. realistic experience, wellbeing, helpfulness of several elements) and possible effects of program-participation on the severity of problem-perception concerning climate change and retreat of glaciers. The 33 classes participating the program at the visitor center of the Swiss national park in Zernez were surveyed three times: before/after the program and with a delay of a month.

First results indicate that participants perceive the VR-experience as realistic, feel comfortable and rarely bored. This impression depends not on age or prior experience with VR-technology (except of wellbeing). Even before program-participation participants indicate high values of concern on climate change and glacier retreat (an indicator for motivation building). After the program, this values increase significantly (but with small effect size). As general indicator for satisfaction with the whole program, 84% of participants recommend (or mostly/rather recommend) their family and friends to participate at the “Expedition 2 Grad”. For the second implementation of the program at the Word Nature Forum in Naters, the results could be used for program adaptions and for refining the evaluation procedure.
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Patterns of Interpretation of Climate Change in Teachers’ Statements and Consequences for Climate Communication in Teaching

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Teacher language is an essential factor in the construction of meaning by learners. An explorative pilot study investigated how teachers communicate climate change. The aim was to discover frames of interpretation in teacher statements in order to generate supra-individual patterns of interpretation by using a combination of qualitative and quantitative methods. Interviews with eight secondary school teachers served as data source. Three patterns of interpretation could be identified, two of which can influence the interpretation of climate change among recipients in such a way that they can promote willingness to act, while the third pattern can inhibit motivation to act.

REFERENCES
Can we build cognitive adaptive capacity through climate change education? If yes, how can it be assessed by scientific means?

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Earth’s climate is changing and climate-related impacts become increasingly apparent. For example, the heatwave over continental Western Europe in July 2019 was found to be closely linked to human interference, making record-breaking heatwaves much more likely (Vautard et al. 2019). Today’s young people, like teenagers, already are affected by extreme temperatures, and they will be challenged by other climate-related phenomena throughout their life-times. Consequently, they are increasingly asked to develop knowledge, respectively skills for solving challenges related to climate change (CC), and for safeguarding a more sustainable future (Gharabaghi & Anderson-Nathe, 2018).

Against this background, CC education comes as a strategy to foster young peoples’ engagement with CC effects. CC education may build young learners’ cognitive adaptive capacity, which is understood as an individual’s intellectual ability to process thoughts and actions related to CC adaptation. In detail, cognitive adaptive capacity, as described by Grothmann and Patt (2005), is determined by (1) subjective risk perception and (2) subjective coping appraisal. Subjective risk perception depends on one’s (1a) perception of being exposed to CC (i.e., perceived probability), and one’s (1b) assessment on the degree of harmful CC effects occurring to him/her (or not) (i.e., perceived severity). In contrast, subjective coping appraisal is determined by one’s (2a) general belief in protective actions (i.e., perceived adaptation efficacy), and one’s (2b) self-assessment of being capable to perform adaptive actions (i.e., perceived self-efficacy) (see Figure 1).

Now, this research hypothesizes that CC education may build teenagers’ cognitive adaptive capacity, as inquiry-based learning confronts teenagers’ with adaptation strategies to local/regional CC risks (Keller et al. 2019). In this context, the research-education cooperation Generation F³ - Fit for Future is presented, in which 175 high-school students collaborated with 57 scientific and non-scientific experts on CC adaptation in North Tyrol (Austria) and South Tyrol (Italy) in school years 2017/18 and 2018/19. Generation F³ - Fit for Future encouraged students to carry out their own research project dealing with current challenges related to CC adaptation in their home-regions.

In methodological terms, a web-based questionnaire yielded treatment and control group students’ (N=235) dimensions of cognitive adaptive capacity. Then, a Wilcoxon-signed rank test was applied to evaluate potential changes in high-school students’ dimensions of cognitive adaptive capacity prior and after CC education, respectively inquiry-based learning. Quantitative data will be triangulated with findings from problem-centered interviews (N=45). In a final step, documentary method will be used to contrast performances from intervention and control group students.
Findings suggest that CC education, respectively inquiry-based learning positively affects two dimensions of high-school students’ cognitive adaptive capacity, mainly (2a) perceived adaptation efficacy and (1b) perceived severity of CC effects. Little evidence comes with (2b) perceived self-efficacy. First qualitative findings confirm that CC education was capable to strengthen high-school students’ cognitive skills necessary to solve local/regional problems in CC adaptation and deepened their understanding of adaptation measures. Effects are unequal across school classes. As fuzziness is inherent to the concept of cognitive adaptive capacity itself, mixed-methodologies and qualitative competence-oriented testing are recommended for further research addressing young peoples’ cognitive adaptive capacity.

REFERENCES