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Geographies of the Anthropocene
IL Sileno Edizioni

21st Century Landscape Sustainability, Development and Transformations: Geographical Perceptions

Giovanni Messina, Bresena Kopliku (Eds.)

Preface by Elena dell'Agnese

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Editors

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The book series "Geographies of the Anthropocene" edited by the Scientific

International Publisher “Il Sileno” (Il Sileno Edizioni) will discuss the new processes of the Anthropocene epoch through the various worldviews of geoscientists and humanists, intersecting disciplines of Geosciences, Geography, Geoethics, Philosophy, Socio-Anthropology, Sociology of Environment and Territory, Psychology, Economics, Environmental Humanities and cognate disciplines.

Geoethics focuses on how scientists (natural and social), arts and humanities scholars working in tandem can become more aware of their ethical responsibilities to guide society on matters related to public safety in the face of natural hazards, sustainable use of resources, climate change and protection of the environment. Furthermore, the integrated and multiple perspectives of the Environmental Humanities, can help to more fully understand the cultures of, and the cultures which frame the Anthropocene. Indeed, the focus of Geoethics and Environmental Humanities research, that is, the analysis of the way humans think and act for the purpose of advising and suggesting appropriate behaviors where human activities interact with the geosphere, is dialectically linked to the complex concept of Anthropocene.

The book series “Geographies of the Anthropocene” publishes online volumes, both collective volumes and monographs, which are set in the perspective of providing reflections, work materials and experimentation in the fields of research and education about the new geographies of the Anthropocene.

“Geographies of the Anthropocene” encourages proposals that address one or more themes, including case studies, but welcome all volumes related to the interdisciplinary context of the Anthropocene. Published volumes are subject to a review process (**double blind peer review**) to ensure their scientific rigor.

The volume proposals can be presented in English, Italian, French or Spanish.

The choice of digital Open Access format is coherent with the flexible structure of the series, in order to facilitate the direct accessibility and usability by both authors and readers.

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Sara Ansaloni, Daniela Santus

11. Environmental risk perception and attitudes on climate-induced migration: survey insights among Geography students at the University of Turin

Sara Ansaloni, Daniela Santus [1]

Abstract

This research investigates the environmental risk perception and attitudes towards climate-induced migration among Geography students at the University of Turin, with a particular focus on the influence of fake news. Drawing from existing literature and prior research, the study aimed to assess the impact of higher education and public awareness initiatives on students' understanding of climate risk and migration. A total of 133 students from geography courses, along with 87 respondents from Earth Sciences and Life Sciences departments, participated in an online survey conducted in October 2023. The findings suggest that despite access to scientific knowledge, students are susceptible to fake news, resulting in a diminished understanding of environmental risks and reduced empathy towards climate migrants. The study underscores the significance of understanding college students' opinions, given their potential impact on shaping future climate change policies, and emphasizes the importance of providing them with essential tools to critically process information effectively in an era characterized by misinformation.

Keywords:

Risk perception, sustainability, migration, fake news, geography

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1. Introduction

The migration issue is assuming characteristics that rise significant concerns in host countries, despite the desire of moving in search of a better place to live being a characteristic trait of humans since ancient times. The reasons that drive people to migrate from their place of origin are varied and complex: among them, there is a relatively "new" one, the climate change (Francis, 2019/2020).

Recognized as climate refugees, a growing population finds itself compelled to relocate in response to the escalating effects of global warming. This trend was initially highlighted in the inaugural report of the *Intergovernmental Panel on Climate Change* (IPCC) in 1990 and reiterated during the 71st session of the United Nations General Assembly. It was during this assembly, on September 19, 2016, that the now well-known *New York Declaration on Refugees and Migrants* emerged, further emphasizing the urgency and complexity of this global issue (Ionesco, Mach, 2016).

Due to steadily rising temperatures and its direct consequences, including droughts, ocean acidification, and rising sea levels, the World Bank forecasts that by 2050 an estimated 143 million people from Sub-Saharan Africa, South Asia, and Latin America will be compelled to migrate (The World Bank, 2018).

Based on this premise, we decided to administer a survey to students enrolled in *Cultural Geography* (undergraduate) and *Geography, Culture and Environment* (graduate) courses at the University of Turin, Italy. The aim was to assess the impact of both higher education and public awareness initiatives on the students' understanding of climate risk. Additionally, we sought to analyze the extent to which fake news, easily accessible on social media, were succeeding in changing and influencing their opinion. The initial hypothesis posits that as individuals tend to underestimate the risks of climate change, their reluctance to acknowledge its effects in other countries increases, leading them to perceive climate migrants as merely seeking a better place to live rather than recognizing their status as refugees.

2. Materials and Methods

Several studies (Ashlin, Ladle, 2007; Gilliam, Bales, 2001; Pasquaré, Oppizzi, 2012; Wilson, 2000) demonstrate the pivotal role of media coverage in shaping public perception in relation to environmental change and natural

hazards. Through the introduction of frames of reference, the media can influence how different individuals or societies perceive climate change, providing information in a way that highlights certain aspects over others. This is significant because the perception of the issue directly influences its response. As emphasized by Pasquaré and Opizzi, a trend that our research is likely to corroborate, Italian journalists tend to concentrate on depicting natural disasters and the resulting damages, thus overlooking vital aspects related to prevention and the advocacy for policies aimed at safeguarding the territory. This shortfall in coverage represents a missed opportunity to effectively raise awareness among the population (Pasquaré, Oppizzi, 2012).

As outlined by Giddens (2008), there are at least three distinct perspectives on climate change. Firstly, climate change sceptics argue that there is insufficient evidence to attribute today's global warming processes to human activity. Secondly, the widespread dissemination of the *Intergovernmental Panel on Climate Change*'s publications[2] has significantly heightened awareness about the risks posed by climate change, aggregating scientific data that outline various potential future scenarios. Finally, there are those referred by Giddens as "radicals", i.e. individuals who believe that: "the ice fields that cover Antarctica and Greenland may disintegrate sooner, and more thoroughly, than is usually believed possible; or that the melting of the frozen peat bogs in western Siberia and in Canada might release large amounts of methane into the air. Methane is a much more potent greenhouse gas than carbon dioxide. Some radicals – such as the scientist James Lovelock – believe it is already too late to avoid dangerous climate change. We had best concentrate most of our energies preparing to adapt to it and cope as best we can. Others think we can still hold back the more devastating effects, but to do so we must start taking far-reaching action in the here-and-now" (Giddens, 2008, p. 6). Other scholars focus on the responses and attitudes that are generated by the way we perceive climate-related risk (Semenza, Hall, Wilson *et al*. 2008) or the anxiety that arises following extreme weather events and natural disasters (Clayton, 2020; Clayton, 2021).

The scenario becomes even more complex when addressing climate-induced migration. Conditions such as natural disasters resulting in limited access to resources and the destruction of villages propel increasingly vulnerable populations to abandon their home territories. While one of the primary challenges lies in defining the phenomenon of climate-change-driven migration, given that the underlying motivation stems from a combination of concauses (including social, political, economic, and environmental

[2] See: ipcc.ch

factors), the very classification of climate migrants poses challenges for acceptance by countries of arrival (Beine, Parsons, 2015). Does a climate migrant have the same reception rights as a war refugee? As Francis states: "Cross-border climate migrants enjoy no protection under international law. While international refugee law offers protection to people displaced across borders by instances of social upheaval such as political conflict, international refugee law provides no protection to people displaced solely by climate-related disasters. Recent international processes like the Global Compact for Safe, Orderly and Regular Migration, the Sendai Framework for Disaster Risk Reduction, and the United Nations Framework Convention on Climate Change have underscored the importance of addressing climate-induced migration, however, international law has yet to provide a governing framework for climate-induced migration. The absence of both legal rights and a comprehensive governing framework creates a key protection gap for cross-border climate migrants" (Francis, 2019/2020, p. 125). If climate factors are not combined with the grounds set out in the 1951 *Refugee Convention* – persecution on the grounds of nationality, ethnicity, religion, political opinion, etc. – there is no legal protection for climate migrants – there is no chance for climate migrants to be granted the right to protection (Francis, 2019/2020; McAdam, 2010). The situation in Italy diverges to some extent, especially with the amendments to the *Security Decrees* of December 18, 2020. These revisions have expanded eligibility for protection to include climate migrants, who are now covered under the same provisions as war refugees (Santolini, 2021). Therefore, climate risk perception not only shapes people's attitudes, with awareness of the risk prompting actions to mitigate the consequences of climate change, but also exerts influence over political decisions concerning people displacement.

Numerous studies (Koubi, Spilker, Schaffer *et al*., 2016; Koubi, Böhmelt, Spilker *et al*., 2018; Warner, 2011) have been conducted to investigate how the perception of environmental degradation motivates migration. However, fewer are those addressing the role of climate risk perception among people in host countries, particularly when the distance between migrant and host population is significant. Indeed, attitudes towards climate migrants are influenced by host-migrant geographical proximity. In simpler terms, people are more likely to welcome individuals affected by an extreme event (such as floods or earthquakes) that occurred within their own borders, compared to those impacted by a similar event thousands of kilometres away (Lujala, Bezu, Kolstad *et al*. 2020). Nevertheless, if the influx of migrants becomes constant and is not the result of isolated events, it could

adversely affect the social acceptance of even internal climate migrants, leading to their exclusion and, in the worst-case scenario, escalating into violence if social tensions intensify between displaced individuals and host communities, particularly in competition for resources (Lujala, Bezu, Kolstad *et al*. 2020; Koubi, 2019; Burke, Hsiang, Miguel, 2015).

3. Research methodology

Perceptions regarding climate change, the associated risks, and its short- and long-term impacts are shaped by the level of knowledge acquired on these subjects through educational institutions such as schools and universities, as well as through exposure to social media and news outlets. Our focus was on exploring risk perception among college students, both at the undergraduate and graduate levels. We believe that the opinions of college students are particularly significant, given that they represent a demographic poised to emerge as future researchers and lawmakers. Their potential impact on shaping future climate change policies and educating the next generation of citizens emphasizes the relevance of understanding their opinions and perceptions (Phillips, Cinderich, Burrell *et al*., 2015).

University students can be considered as "privileged witnesses" since they represent a segment of the population that encounters these issues in the educational setting. Additionally, they are exposed to climate-related information through newspapers, television programs, and social media. It is precisely this last aspect that renders our analysis interesting. Despite university students having greater access to scientific knowledge, their heightened exposure to online risks is noteworthy. Relying on the Internet for research, they appear less inclined to verify sources, consequently running the risk of mistaking inaccurate or entirely false information for reliable sources (Metzger, Flanagin, Zwarun, 2003; Phillips, Cinderich, Burrell *et al*., 2015).

In addition, as highlighted by Lombardi and Sinatra (2012), college students harbor various misconceptions regarding climate change. For instance, they often rely on short-term weather effects to either substantiate or dismiss long-term climate transformations, indicating a fundamental misunderstanding of the distinctions between weather and climate (Lombardi, Sinatra, 2012).

The present study employs a qualitative research methodology designed to probe students' understanding and perspectives on climate change and climate-induced migration, drawing from existing literature and prior research.

In particular, 235 students were invited to participate in the survey. Of the respondents, 6 were male, and 219 were female, falling within the age range of 18 to 26. All participants were enrolled in one of two geography courses offered by the Department of Foreign Languages and Literature and Modern Cultures at the University of Turin. Specifically, 180 students were enrolled in *Cultural Geography*, an undergraduate course, while 55 were enrolled in *Geography, Culture, and Environment*, a graduate course. Both courses have covered subjects related to the environment, sustainability, climate change, and human rights issues during the first semester of the academic year 2023-2024. It is important to note that the survey was intentionally administered before these topics were addressed in the coursework. The questionnaire aimed to capture both factual knowledge and subjective opinions, providing a comprehensive view of the participants' attitudes toward the subject. The methodology focused on gathering structured data that could be analysed by comparing the percentage distribution of responses to different questions, enabling a quantitative assessment of the overall trends and variations in students' perceptions. Prior to data collection, a thorough review of available literature on the topic was undertaken to inform the design of the questionnaire and guide the interpretation of results. The utilization of percentage-based data analysis offers a straightforward and interpretable approach to understanding the collective mindset of university students on climate change and climate-induced migration. To gather demographic data, students were asked to indicate their gender, age, major, and year in college. Quantitative analysis of the data involved utilizing univariate frequency distributions and bivariate cross-tabulation procedures. Additionally, content analysis was employed to look for patterns in the open-ended question.

The survey was administered online through the Moodle platform, with all invited students duly informed about the processing of personal data. The participation rate was moderate, with 103 responses from undergraduate students and 30 from graduate students. An additional 120 students, evenly distributed between the Department of Earth Sciences and the Department of Life Sciences and Biology, were invited via their academic email addresses, resulting in 87 responses: 58 from undergraduate courses and 29 from graduate courses. Overall, across the three departments involved, a total of 220 responses were obtained, with 86% of respondents being female. This outcome aligns with expectations, given that the courses offered by the Department of Foreign Languages and Literature and Modern Cultures at the University of Turin are attended by over 95% female students. Unfortunately, this distribution prevented us from exploring potential variations in attitudes based on gender.

Another criterion employed was the exclusion of incomplete questionnaires, deeming them invalid. Consequently, 100 questionnaires from undergraduate students and 30 from graduate students in the Department of Foreign Languages and Literatures and Modern Cultures, along with all 87 questionnaires from students in the science departments, met the criteria for validity.

The opinion of college students enrolled at the University of Turin has been the subject of various research studies related to sustainability and the environment. Notably, a 2021 study focused on humanities course attendees explored the correlation between climate anxiety and exposure to climate change through media representations (Acquadro, Begotti, 2021). The same year another research delved into the perception of environmental sustainability among students, technical personnel, and faculty of the Politecnico di Torino (Sonetti, Sarrica, Norton, 2021). Interestingly, a survey conducted in 2022 among students of the *Cultural Geography B* course at the Department of Foreign Languages and Literature and Modern Cultures aimed to examine university students' perceptions of sustainability and environmental issues (Genovese, 2022). Our research stands out in its specificity, seeking to understand how the perception or lack thereof of the risk posed by climate change may positively or negatively influence the comprehension of climate-induced migration.

The survey, consisting of 10 closed-ended questions (three of which were supported by images) was administered during the first ten days of October 2023. Following the completion of the survey, we engaged in a reflective discussion with the entire class through a live WebEx session, addressing aspects such as survey participation, risk perception, the efficacy of Civil Protection warning systems, and environmental migration.

4. Results

The first survey question, supported by a visually impactful collage (**Fig. 1**) showcasing some of the consequences of climate change (drought, melting glaciers, floods, fires), prompted the respondents with the following directive: *"Examine the photo collage and, in no more than 5 lines, describe what it represents to you (one or more events), the emotions it evokes, and identify any shared cause, if present"*. Unaware that the survey focused on environmental risk perception, students provided diverse responses. While students in the science departments uniformly recognized global warming as the common cause across the four images, those in the Language Department offered a

range of interpretations. The drought represented by the parched and cracked earth was identified by all 130 students, whereas the image of the melting glacier was alternatively perceived as a frozen lake in winter (18 students), a crater (another 18 students), an earth surface view from Google Earth (2 students), and correctly as a melting glacier by the remaining students. The flood, as well as the forest fire image, was correctly identified by all surveyed students.

Notably, respondents in the science departments universally acknowledged global warming as the overarching theme across the four images. This awareness translates in different emotional responses, including fear for the future (4 students), desolation (12 students), a desire for carefree living (12 students), anxiety (15 students), distress (18 students), and anger (26 students). Similarly, most students in the Language Department (comprising 83 undergraduate and graduate students) identified global warming as the common thread. However, other causes were proposed, such as nature rebelling (4 students), experiments in space (1 student), mismanagement by municipalities (1 student), and neglect (1 student). The remaining 40 students succinctly attributed the issues to "men's fault". Delving into their emotional responses, prevalent sentiments included helplessness (12 students), fatalism (16 students), anger (38 students), and a sense of lacking peace or serenity (49 students), while 15 students expressed "disgust for politicians", "concern", and "indifference". Interestingly, as highlighted by the *New Scientist*'s 2021 research, young individuals' sense of helplessness, lack of prospects for the future, and the belief that the effects of the global warming are irreversible and beyond repair, translate into a lack of willingness to adopt sustainable lifestyles (Duffy, 2021). This aspect is crucial, as will be evident in Table 4, which examines the implementation of environmentally sustainable practices, since ignorance, indifference, but above all, the feeling of powerlessness, directly influence the failure to adopt these practices or the aspiration to do it in the future.

Figure 1

The set of questions 2-3-4-5 (**Tab.1**), specifically delves into the impact of fake news on altering students' perception of climate change. The statements reference the most frequently adopted arguments by those who believe in misinformation, to which students were required to respond with true or false.

	Language Department		Science Departments	
Statements	Undergraduate	Graduate	Undergraduate	Graduate
Climate change does exist and is caused by solar activity	16% true	23% true	5% true	0% true
	84% false	77% false	95% false	100% false
Extreme heat in summer is a natural occurrence. Scientists are "puppets" controlled by the institutions aiming to instil fear in the population.	5% true	10% true	0% true	0% true
	95% false	90% false	100% false	100% false
It's too late now, the planet has only a few years left.	22% true	16.6% true	0% true	0% true
	78% false	83.4% false	100% false	100% false
Plants and animals will adjust to the changing levels of CO2	33% true	26.7% true	0% true	0% true
	67% false	73.3% false	100% false	100% false

Table 1 – Impact of fake news on students perception

Combining data from both undergraduate and graduate students, the findings revealed that among 130 students enrolled in Geography courses within the Language Department, 23 students (about 18%) believe in the existence of climate change but attribute it to the natural action of the sun. In comparison, this percentage trop significantly to 3.4% (3 students) among those enrolled in the science departments. A surprising response emerged from a small but notable group of students – 8 in total (5 undergraduates and 3 graduates), representing 6% of Geography students. They expressed conviction that scientists are manipulated to instil fear through the narrative of global warming. This *"hoax"* has gained traction during the hot summer of 2023. Interestingly, this belief has in no way affected the students of the science departments. Similarly, none of the students in the science departments shared the belief that the planet has "only a few years left to live", a sentiment expressed by 27 students (21% of the respondents) in the Language Department. Lastly, possibly due to a lack of knowledge rather than exposure to misinformation, 41 Geography students (31.5%) held the belief that plants

and animals will adapt to new levels of CO_2. Interesting, this statement was universally recognized as false by all students in the science departments.

The sixth question, paired with an image (**Fig. 2**), presented four possible options to describe the picture (**Tab. 2**). The aim was to analyse whether college student respondents were, to varying degrees, influenced by the conspiracy theory suggesting that "powerful entities" harm people through "chemical trails".

Figure 2 (Credit: Freepik.com)

	Language Department		Science Departments	
Answers	Undergraduate	Graduate	Undergraduate	Graduate
Condensation of micro-particles of toxins intentionally dispersed by aircraft to harm the population	6%	0%	0%	0%
Chemical trails	45%	73,3%	0%	0%
Vapor trails (contrails)	41%	13,3%	96,6%	100%
Experiments aimed at changing the global climate	8%	13.3%	3,4%	0%

Table 2 – Students interpretations of contrails

In this instance, the investigation aimed to explore one of the most famous climate-related false narrative: the "chemtrails" conspiracy theory. Originating in the United States in 1997 by a group of bioterrorism enthusiasts, this theory posited, without substantiated evidence, that the US Air Force dispersed mysterious and dangerous substances over the population through planes, leaving distinctive contrails. Despite numerous refutations, this "news" has proliferated, leading the most susceptible to believe in a global conspiracy involving the dispersal of poisonous substances on Earth for nefarious purposes (Corbett, 2020; Tingley, Wagner, 2017). Various beliefs surround this theory, ranging from suspicions of ethnic extermination to conditioning public opinion or generating new diseases to support the pharmaceutical trade. Some even assert that it is an attempt to manipulate and control the climate. As is typical with conspiracy theories, consensus is elusive, but a common thread is the conviction that the distinctive white streaks in the sky are abnormal.

While it is somewhat reassuring that 45 language students (both undergraduate and graduate) identified contrails in the photos, it is disconcerting that 6 believed them to be airborne poison particles, 67 perceived them as chemtrails, and 12 thought of them as experiments to alter the climate. In essence, a staggering 65% of the total sample – 85 out of 130 students – when encountering streaks of condensed water vapor in the sky left by airplanes, are persuaded that they are entangled in a conspiracy against themselves and fellow citizens. More encouragingly, students in the science departments showed better discernment, with only 2 undergraduates (out of a total of 87 respondents) entertaining the idea that the contrails depicted in the picture represented experiments aimed at manipulating the global climate.

Questions 7 (**Tab. 3.1**) and 8 (**Tab. 3.2**) were designed to assess fundamental knowledge about climate change and resource exploitation. Respondents were required to demonstrate their understanding of the concept of "overshoot day" by selecting the correct answer from four different alternatives.

	Language Department		Science Departments	
Statements	Undergraduate	Graduate	Undergraduate	Graduate
Hoax	4 %	0%	0%	0%
The day of the year when all the resources available for that year were consumed	84%	100%	100%	100%
The day scientists have calculated that humanity will cease to exist	9%	0%	0%	0%
An attempt to impose single-mindedness by powerful entities, falling on American Independence Day	3%	0%	0%	0%

Table 3 – The meaning of overshoot day and climate crisis
Tab. 3.1

As the *Fridays for Future* generation, we assumed there would be no ambiguity in grasping the significance of "overshoot day". Indeed, 100% of both undergraduate and graduate students in the science departments correctly identified it, along with 84% of undergraduates and 100% of graduate students in the Language Department. It is noteworthy that 16 students selected the incorrect answer. Some even speculated that it might be a hoax, the day of humanity's cessation, or an attempt to manipulate thoughts by unspecified "powerful entities", marking the overshoot day on American Independence Day.

Following this, the respondents were asked to determine whether the statement "*The climate crisis is not only increasing fires, droughts, and heat waves but also snowstorms*" was true or false. Given that our interviewees were university students, we assumed they were aware not only of the overall rise in average air temperatures worldwide but also that this, in turn, leads to increased water vapor retention in the atmosphere, contributing to more intense rain and snow events in certain regions. The responses, however, raised concerns. While our interviewees were likely aware of the significant snowstorm that affected the United States in late 2022 and early 2023, some may have been influenced by misinformation circulating on the internet, incorrectly linking these snowstorms as evidence against the reality of global warming. Notably, 17 undergraduate students

and 4 graduate students in the Language Department expressed a belief that global warming cannot result in extreme events such as snowstorms.

	Language Department		Science Departments	
Statement	Undergraduate	Graduate	Undergraduate	Graduate
The climate crisis is not only increasing fires, droughts, and heat waves, but also snowstorms. True or False?	83% true	86.7% true	100% true	100% true
	17% false	13.3% false	0% false	0% false

Tab. 3.2

The ninth question was accompanied by a picture (**Fig. 3**), specifically portraying a group of climate migrants. Students were tasked with providing a definition of "climate migrants" and expressing their opinion on whether climate-related reasons could be considered valid for leaving one's country. It's important to note that, during the questionnaire's administration, Italy was grappling with a pressing migration issue, amplified by a significant increase in coastal landings (excluding entries through other means) compared to the preceding two years. Referring to data from the Ministry of the Interior, between January 1 and September 15, 2021, there were 42,750 landings, increasing to 66,237 in the same period of 2022, and further surging to 127,207 in 2023 (Ministry of Interior, 2023). Immigration concerns were a daily focus in the media during the questionnaire's period, given its prominence in the political agendas of various parties leading up to the European elections in 2024.

Figure 3 https://www.actionaid.it/informati/notizie/cambiamenti-climatici-aumentano-migrazioni

The definition of "climate migrant" posed no difficulty; all students demonstrated a clear understanding. Setting aside those who directly quoted the Wikipedia definition, the variation among others were minimal. Most respondents provided definitions such as "those who leave their country due to climate-related reasons", while others specified "those emigrating due to droughts", or "individuals compelled to relocate due to natural disasters", and "migration driven by climate or natural disasters", with examples like "earthquakes, fires, floods necessitating emigration". Responses to the second part of the question, addressing whether climate could be a valid reason for leaving one's country, were more elaborate. Some students, while acknowledging it as a valid motivation, added nuances like "the motivation is valid, but staying in the country of origin to improve one's situation would be preferable", or "it is legitimate to leave one's homeland if climate conditions make life untenable, but in Italy, there is not enough space to accommodate everyone", and so forth. More detailed discussions emerged during the post-survey virtual classroom brainstorming, which we will elaborate on in the article's conclusions.

The tenth question (**Tab. 4**) aimed to assess awareness regarding the impact of small daily actions on slowing climate and resource deterioration. Furthermore, it sought to understand whether individuals were willing to alter their habits for the sake of the environment. Respondents were presented with a list of 10 good practices accompanied by the following directive: *"Those who believe that climate change is harming life on the planet are convinced that even small everyday actions can achieve important results. Which of these actions do you already put into practice for the well-being of the Earth and its inhabitants? Answer with 'yes', 'no', 'no, but now that I know, I will', or, if you do not believe in climate change, mark 'I do not believe in climate change' for all choices".*

	Language Department		Science Department	
Answers	Undergraduate	Graduate	Undergraduate	Graduate
Yes	84%	90%	72,4%	86%
No	3%	0%	8,6%	0%
I don't know	13%	10%	19%	14%

Table 4 – Implementation of sustainable practices by students

The outlined environmentally friendly practices include:

- Limiting my shower time to five minutes;
- Organizing and storing food in the refrigerator with care to ensure proper air circulation for optimal performance;
- Opting for minimally processed foods during breakfast to reduce environmental impact, favoring seasonal fruits, bread, homemade cakes, and biscuits;
- Choosing sustainable transportation options such as cycling or walking instead of using my car whenever possible;
- Utilizing recycled paper for printing notes;
- Conserving water in the bathroom by turning off the tap while soaping hands, brushing teeth, or shaving;
- Turning off stand-by units (red, green, or yellow lights) of electronic devices like decoders, TVs, blenders, PCs, and microwaves before going to bed;
- Setting the air conditioning temperature no lower than 26 degrees Celsius during the summer;
- Prioritizing waste reduction by minimizing packaging before disposing of paper in its designated container;
- Engaging in recycling practices.

Three trends emerge from the analysis of the results. Firstly, none of the respondents explicitly declared a complete disbelief in the existence of climate change. Secondly, among the commendable environmental practices adopted by all participants, the noteworthy prevalence of differentiated waste collection suggests the positive impact of consistent municipal efforts. Thirdly, a concerning observation arises: none of the respondents, upon learning about additional beneficial climate practices, expressed a commitment to adopt them with the response "now that I know, I will do it". This indicates a level of concern for climate and resources, yet a reluctance to implement changes in daily habits, such as conserving water or using recycled materials.

Despite the lack of adequate infrastructure being a potential hindrance to the implementation of certain practices, the issue lies in the fact that, irrespective of this, none of the respondents expressed an intention to try in the future. In fact, 100% of our respondents, across all departments, indicated that these practices are not part of their routine, and not a single respondent stated that, now being aware of their benefits, they would attempt to incorporate them. Similarly, since these are small actions that require minimal effort, no one mentioned turning off, before bedtime, all stand-by switches

on devices such as set-top boxes, TVs, blenders, PCs, and microwaves, or consciously reducing cardboard packaging before disposal. In this regard, 87 out of 220 respondents, or nearly 40% of the combined total from both groups, confirmed that they do not and do not wish to pursue this practice.

These results align with recent studies (Duffy, 2021; Wachholz, Artz, Chene, 2014; Gifford, 2008; Gifford, 2011; Witmarsh, 2009) that specifically explore the concerns and implementation of environmentally friendly actions among younger generations. In particular, the *New Scientist* 2021's study examined a sample of the London population consisting of 2050 adults aged 18+. It revealed a nearly identical level of agreement across different generations regarding the impact of climate change and the need of lifestyle changes. The divergence in perspectives lies in the priority level, as older age groups tend to prioritize economic growth over environmental issues. Interestingly, in contrast to common perception, the younger generations tend to be more fatalistic about the impact of their individual actions on climate change. Indeed, 33% of Gen Z and 32% of Millennials in the UK believe there is no point in changing their behaviour since "it won't make a difference", compared to 22% of Gen X and 19% of Baby Boomers. Our study's findings echo this sense of helplessness and lack of optimism about the future, translating into a reluctance to adopt environmentally friendly behaviours among the student respondents. Contrary to stereotypes about Millennials and Gen Z being "purpose-driven consumers", it is, in fact, the older generations that exhibit sensitivity in choosing brands that are sustainable or socially responsible. Moreover, Baby Boomers and Gen Z are the most likely to boycott a brand or product due to social concerns (Duffy, 2021).

Other studies (Wachholz, Artz, Chene, 2014; Gifford, 2008; Gifford, 2011; Witmarsh, 2009) express concerns that even among the most informed college students, their worry does not translate into action to mitigate climate change, despite being aware of how their behaviour affects the environmental problem. In fact, the study conducted in New England by Wachholz *et al*. (2014) on a sample of 375 college students demonstrates that belief in and concern about climate change are not automatically preconditions for action. According to Gifford, the reasons are diverse and include climate-adverse infrastructures, lack of knowledge about the cause of climate change and mitigation mechanisms, entrenched habits, and a lack of hope due to the failure of national and global climate change policies (Gifford, 2008; Gifford, 2011). It is worth noting that the "climate generation" not only came into existence in an era of reduced scientific uncertainty regarding climate change but also against the backdrop of weak international climate change treaties.

As emphasized by Wachholz *et al*., the "climate generation" is also the "failed treaty generation" (2014, p. 137).

Regarding our study, to provide an accurate interpretation of certain responses, it's essential to consider that the surveyed students were predominantly Italian or born in Italy (only 11 out of 220 students were foreigners). Indeed, some environmentally friendly practices may not align with certain typically Italian cultural habits. For instance, it should not be surprising that none of the respondents claimed to shower in five minutes. According to a recent Doxa survey of 1,000 respondents aged between 18 and 64, 75% of Italians sing in the shower, 67% listen to the radio, 56% shave or groom, and 25% talk on the phone. Additionally, 75% of the respondents occasionally shower with their partners, 43% often shower with their young children, and 7% admitted to occasionally showering with their dogs (BVA Doxa, 2019). These activities typically exceed a five-minute timeframe. Similar patterns emerge concerning habits like turning off the water while soaping hands, brushing teeth, or shaving. As reported by the Doxa survey, 57% of respondents turn off the water while soaping, demonstrating efforts to reduce water waste. However, this behaviour was more prevalent among interviewees over 55, mainly from southern Italy, where water scarcity is more common. Age and geographical origin data clarify why our respondents, aged 18 to 26 and residing in a northern Italian region, exhibit less concern about water wastage.

The preference for specific breakfast choices among our interviewees, particularly in terms of sustainability, is also influenced by a characteristic deeply rooted in Italian food culture. Notably, 100% of respondents rely on processed products and express no intention to alter this habit. It's a well-known fact that Italians, as a cultural tendency, are not inclined to have breakfast at home. In 2019, a pre-Covid reference year, the *Federazione Italiana Pubblici Esercizi* (Fipe) reported that 65.7% of Italians preferred enjoying breakfast at a café with cappuccino and brioches, a percentage that increased with the age of the respondents (FIPE, 2019). With the return to regular commuting following the pandemic, Italians resumed the ritual of having breakfast at the café, briefly disrupted during lockdowns. Common choices in 2022 included stuffed croissants and espresso coffee, with a rising trend in cappuccino consumption and a decline in fruit juices (Pini, 2023, 2019). Despite some downsizing observed in 2023 due to post-pandemic adjustments and inflation, Pirovano's survey suggests that Italians' breakfast preferences, whether at home or at the café, have changed minimally, with a continued reliance on industrial products (Pirovano, 2023).

To comprehend why our respondents (89 students from the Language Department and 59 students from the science departments) indicated a preference for cars over cycling or walking, a reflection on Italy's road infrastructure becomes imperative. Data reveals that Italy, as highlighted in the dossier by Clean Cities, FIAB, Kyoto Club, and Legambiente, is not particularly conducive to cycling. Notably, investments in the automotive sector were nearly 100 times greater than those allocated to bicycles: 98 billion compared to just over a billion (Magliulo, Talluri, 2022). The situation is exacerbated by policies that disincentivize public transport use, such as reducing train services on Sundays and eliminating bus services in summer months. This holds true even in numerous Piedmontese municipalities where car-free travel is either impractical or exceptionally challenging.

The eleventh set of questions constituted a series aimed at assessing students' awareness of climate change effects and their perception of associated risks. The students were prompted with the following inquiries:

- *Have you ever heard the term "climate migrants"?* The breakdown of negative responses is as follows: 87 undergraduates and 11 graduates from the Language Department, along with 23 undergraduates and 7 graduates from the science departments.

- *If yes, where did you come across this term?* As illustrated in Table 5, respondents who affirmed familiarity with the concept of climate migrants (32 students in total from the Language Department, including 13 undergraduates and 19 graduates, and 57 students from the science departments, comprising 35 undergraduates and 22 graduates) identified six primary information sources: news or TV programs, newspapers, the Internet (including Google searches, reading speeches by politicians or intellectuals, and watching interviews on YouTube or social media), conversations with friends, discussions with family members, and educational settings (comprising high school or university). Due to respondents often selecting multiple options, the data is presented in absolute numbers, with no distinction between degree courses.

Information Sources	Language Department	Science Departments
News or TV programs	9	23
Newspapers	2	9
Internet	18	45
Friends	1	3
School	6	21
Family	2	1

Table 5 – Information sources for climate migration

The analysis of this information reveals that schools generally lack comprehensive coverage of the subject, and climate migration isn't a prevalent topic in informal conversations among friends or family. The primary sources of information, as observed, are the Internet and various media outlets.

• Concerning *awareness of global warming during high school or university years,* 17.7% of the 130 students enrolled in undergraduate and graduate Geography courses (23 students in total) responded affirmatively. It's essential to note that the survey took place before the integration of environmental issues, sustainability, and the 2030 Agenda into the Department's two Geography courses. On the other hand, 100% of the sample from the two science departments (87 students) acknowledged awareness. The choice of this group as a comparative sample was deliberate, aiming to include students from the Departments of Earth and Life Sciences and Biology, expecting a high level of knowledge and sensitivity to the topic. The objective was to explore whether the perception of climate risk and empathy toward climate migrants could be influenced by the sources of information: educational institutions or other.

• *If the answer is affirmative, in what subjects?* The 23 students from the Language Department who affirmed awareness mentioned Geography courses in secondary schools (Technical Institutes for Tourism) or Cultural Anthropology courses attended at the university. In contrast, the 87 students from the two science departments primarily referred to subjects within their courses of study, such as Ecology, Marine Biology, Geography, Climatology, Nature Conservation, Sustainable Agriculture, Plants and Microorganisms for Environmental Sustainability, Plants and Environmental Restoration.

• *Do you believe that the looming threat of depleting resources will impact your quality of life? If so, how?* Most students responded affirmatively: 87 students in the Language Department, approximately 67%; and 79 students in the science departments, about 91%. Among those who answered negatively, many emphasized that this won't happen because they fortunately live in northern Italy. On the contrary, among those who answered positively, several highlighted concerns such as "if climate change forces many populations to emigrate, it will create a cultural problem or a lack of work in the host countries, resulting in a decrease in the quality of life for everyone". Additionally, responses included concerns about the impact on tourism, shorter ski seasons, increased costs for goods and services, rising diseases, and potential shortages of goods on supermarket shelves, similar to what was experienced during the pandemic period.

• *In your perception, is climate change the environmental problem that needs the most attention, or are there others that are more urgent?* This question aimed to examine whether perceptions of climate risk remained consistent or had changed since a similar questionnaire was administered to another group of undergraduate students in the same department in 2022 (Genovese, 2022). During that previous survey, about 80% of the students selected global warming as the phenomenon requiring the most urgent action. However, in the previous study, students were provided with a list of potential options to choose from, including global warming, plastic pollution, environmental impact of industries, food contamination and waste, forest loss, and intensive farming. In our current questionnaire, we opted for an open-ended question, focusing primarily on the perception of climate risk. Unfortunately, the open-ended nature of the question, coupled with a quick reading, led several students to interpret it as an inquiry into "the most urgent problem in Italy" rather than "the environmental problem" requiring more attention globally. As a result, only half of the students from the Language Department – 47% (61 undergraduate students) and 57% (17 graduate students) – identified global warming as the most urgent problem. In contrast, most students from the science departments, with 93% (54 undergraduate students) and 90% (27 graduate students) of respondents, recognized it as the most urgent problem.
• In response to the question *"If you believe there are other urgent issues, please specify which ones you consider most pressing"*, 52 students from the Language Department and 6 students from the science departments identified alternative urgent problems. However, some language students, failing to recognize the link between global warming and its effects, suggested warming of the seas (7 students), melting glaciers (8 students), and frequent flooding (13 students) as the most urgent issues. Others, from both groups, mentioned concerns such as "unemployment", "war", "gender-based violence", "corruption", and "loneliness".
• The following two questions investigate young people's concerns about worsening natural disasters (**Tab. 6.1**), with responses ranging from being very concerned that it will happen to not being concerned at all. Additionally, it explores the impact of such concerns on daily lifestyle choices. As evident in the first table, most students in the Language Department express concern about a worsening of natural disasters. Conversely, all the students in the science departments answered affirmatively. Interestingly, despite the majority of students in both departments expressing concern, this is not reflected in their daily behaviours. In fact, **Table 6.2** shows the students' responses to the question of whether they inquire about the seismicity of an area before

buying or renting a house. All students replied negatively. These findings are particularly concerning, given that Italy is a highly seismic country. However, the area of Turin, where the survey was conducted, is one of the few exceptions.

	Language Department		Science Departments	
Answers	Undergraduate	Graduate	Undergraduate	Graduate
Yes	72%	80%	100%	100%
No	28%	20%	0%	0%

Table 6 – Perception of worsening natural disasters and related actions

Table 6.1 – *Do you think natural disasters will get worse?*

	Language Department		Science Departments	
Answers	Undergraduate	Graduate	Undergraduate	Graduate
Yes	0%	0%	0%	0%
No	100%	100%	100%	100%

Table 6.2 – *Before buying or renting a house, do you inquire about the seismicity of the area or the possibility of flooding?*

It's noteworthy that the initial seismic classification of the national territory dates to 1909 with Royal Decree No. 193, issued after the catastrophic earthquake in Reggio Calabria and Messina on December 28, 1908. Subsequent regulations, including Royal Decree No. 573 of 29/04/1915, Royal Decree No. 431 of 13 March 1927, and Law No. 1684 of 25 November 1962, updated the lists based on successive seismic events. With Law No. 64 of 2 February 1974, the Ministry of Public Works was recognized as the body responsible for issuing technical standards for both public and private buildings, in agreement with the Ministry of the Interior and in collaboration with the National Research Council (CNR). The seismic classification was further updated. A significant step in this process was the establishment of the Major Risks Commission, which appointed a Working Group, including the National Seismic Service, the National Group for Earthquake Defence, and the National Institute of Geophysics and Volcanology. This group proposed the reclassification of the Italian territory, leading to the one issued

by Civil Protection in March 2003. Accordingly, the entire national territory is divided into four seismic zones, characterized by increasing seismic hazard: Zone 1 (high seismicity), Zone 2 (medium seismicity), Zone 3 (low seismicity), and Zone 4 (very low seismicity). Turin falls within Zone 4.

Similarly, the risk posed by hydrogeological instability doesn't directly impact the city of Turin. Nevertheless, the overall situation is a cause for significant concern since, across Italy, 5.4% of the national territory falls within high hazard/probability areas, covering a potentially floodable surface of 16,223.9 km^2. This surface area expands to 30,195.6 km^2, or 10.0% of the national territory, in a medium hazard/probability scenario. In a low hazard/probability scenario, the potentially floodable surface reaches 42,375.7 km^2, representing 14.0% of the total national territory. Even though Turin itself may not be directly affected, 5.1% of the Piedmont region's territory is at high risk, 8.3% at medium risk, and 13% at low risk (Trigila, Iadanza, Lastoria *et al.*, 2021).

It is not surprising that hardly any of the students interviewed had ever heard of the so-called "seismic bonus", i.e. the measure aimed at taxpayers who carry out earthquake-proof measures on buildings and who, thanks to this bonus, can deduct part of the expenses incurred from their income tax. As evident from Table 9.1, in which the students responded to the question *"are you aware of the seismic bonus"*, most students in both departments had never heard about it. Certainly, our interviewees not only study and mostly reside in Turin, but they are also young students who are generally not yet employed, and thus, they might not be particularly interested in potential tax relief. Nevertheless, we believed that the information, widely disseminated through the media, could still be known to them.

	Language Department		Science Departments	
Answers	Undergraduate	Graduate	Undergraduate	Graduate
Yes	0%	10%	0%	0%
No	100%	90%	100%	100%

Table 9 – Perception of seismic risk and related actions

Table 9.1 – *Are you aware of the seismic bonus?*

	Language Department		Science Departments	
Answers	Undergraduate	Graduate	Undergraduate	Graduate
Yes	0%	10%	0%	0%
No	100%	90%	100%	100%

Table 9.2 – *Would you consider purchasing an apartment in a seismic zone and renovating it with the help of the seismic bonus?*

	Language Department		Science Departments	
Answers	Undergraduate	Graduate	Undergraduate	Graduate
Yes	0%	6,6%	5%	41,4%
No	100%	93,4%	95%	58,6%

Table 9.3 – *Have you ever participated in any specific information campaigns regarding environmental risks?*

The information and awareness campaigns on environmental risks, such as those conducted by the Ministry of the Environment and Energy Security (MASE, 2023) or initiatives organized by different environmental agencies (APAT, 2024) and organizations like WWF[3], to name a few examples, appear to have gone almost completely unnoticed by our interviewees. Indeed, most of the respondents do not recall ever having encountered such campaigns. An exception was noted among the 12 graduate students from the science departments who not only recalled seeing them but also mentioned actively participating in their organization.

Regarding eco-anxiety, which is the profound feeling of unease and fear associated with the recurring thought of possible disasters related to global warming and its environmental effects, we asked students if they had ever heard of it and if they were affected by it. Despite a 2019 survey conducted by SWG in Italy on a sample of 800 young adults indicating that, for 51% of them, climate change is the primary source of their uneasiness (SWG, 2019), the majority of our respondents have never heard of eco-anxiety (93% of the total sample of the Language Department and 78% of the science departments). Moreover, they do not believe they are affected by it: in fact, 100% of both samples, while expressing partial concern about a potential worsening of the climate, assert that they do not suffer from eco-anxiety. This

[3] https://www.wwf.it/cosa-facciamo/campagne/

second statement is in stark contrast to the findings of several international studies (Usher, Durkin, Bhullar, 2019; Kurth, Pihkala, 2022; Ma, Moore, Cleary, 2022). Specifically, we considered Pihkala's study (2020), revealing that eco-anxiety disproportionately impacts individuals under the age of 30, most notably, women.

	Language Department		Science Departments	
Answers	Undergraduate	Graduate	Undergraduate	Graduate
Yes	97%	100%	100%	100%
No	3%	0%	0%	0%

Table 9.4 – *In the event of a severe climate emergency, do you consider emigrating a valid course of action?*

This aspect is particularly interesting because, as evident in the preceding figures, students expressed doubts and uncertainty about the existence of climate change and the need to emigrate due to natural disasters. However, the percentages shift when the question is posed on a personal level. In fact, almost all respondents would contemplate emigrating (**Tab. 9.4**). Only three undergraduate students from the Language Department responded negatively, stating: "Emigrating would not be my first choice, but I would explore other solutions. If the climate emergency affects the whole planet, the challenges to living would be ubiquitous", or "I would not emigrate; I believe that with appropriate techniques, you can survive anywhere", and "They tried to scare us with the fake virus; they won't be able to scare us away with the excuse of the climate".

5 - Discussion and conclusions

An Ispra report (Trigila, Iadanza, Lastoria *et al*., 2021) highlights that 93.4% of Italian municipalities face hydrogeological risks, which are exacerbated by global warming each year. The damages resulting from the effects of global warming also carry significant economic implications. For instance, the May 2023 flood in Emilia Romagna caused a staggering 9 billion in damages, ranking as the third most expensive natural disaster globally in 2023[4]. Despite these evident challenges, Italy remains a destination for climate migrations from countries experiencing dire situations. In fact,

[4] See: https://tg24.sky.it/ambiente/2023/10/20/cambiamento-climatico-italia-danni-costo

immigration to Italy is increasingly influenced by climate-related factors (IDOS, 2022). Hence, the questionnaire was designed to gather information on the general perception of climate risk, with a specific focus on Italy, particularly on seismic and hydrogeological risks. Additionally, we aimed to understand how students' perceptions, influenced by fake news, impact the implementation of sustainable practices. Lastly, we sought to examine the perception and understanding of climate migration. It's worth noting a discrepancy between the responses of students in the Language Department and those in the science departments, with the former being more prone to accepting climate-related fake news as true compared to the latter.

As suggested by the presented data, even at the university level, students lack essential tools to critically process and comprehend information effectively. Except for courses dedicated explicitly to Biology or Earth Sciences, we are dealing with a generation of students inundated with messages and content but lacking the ability to distinguish reliable sources from misinformation. This phenomenon is exemplified by the 67 students (out of 130) from the Language Department who, upon observing contrails from planes in the sky, mistakenly interpret them as chemical trails, experiments aimed at altering the global climate, or intentional release of poisonous particles. We find ourselves in an era where the ideal of universally accessible information via the Internet (and now through various forms of artificial intelligence) has been pursued, yet the absence of critical tools has resulted in and continues to contribute to significant harm.

It is noteworthy that, upon further reflection on the Language Department sample, a significant number of students hold the belief that the deterioration of resources will not impact their quality of life. These responses reveal a lack of knowledge and a tendency to embrace false information circulating on the Internet. A considerable portion, 107 students, admitted they have never heard of global warming, while others claimed ignorance regarding climate migrants, asserting that global warming is not the most urgent issue. This lack of awareness contributes to a diminished perception of risk (Biondo, La Rocca, Trapani, 2022). Individuals are uninformed about environmental risk awareness campaigns, lack knowledge about seismic or hydrogeological risks in the regions they plan to inhabit, and attribute climate change to natural factors rather than human activities. Consequently, people exhibit reluctance to modify their daily routines to support climate improvement. Some students express fatalistic views, believing that the planet has only a few years left. This knowledge deficit also influences attitudes towards climate migration. In response, we have decided to conduct a dedicated session for

discussing these results, utilizing participatory observation methodology and providing ample space for spontaneous interaction among students.

On October 23, a WebEx meeting was organized for the respondents of the Language Department, aiming to encourage broad participation. The initial notable observation was that out of the 130 students who took part in the survey, 43 (approximately 33%) attended this reflective session. During the collective discussion, the prevailing sentiment was that climate-related issues were not perceived as significant: "as long as it's hot, we save on the gas bill", "it's not that bad, it's almost the end of October, and I still go to the beach on weekends", "now we complain that it's hot; in winter, we'll complain that it's cold— we're never happy". Participants mentioned that their primary sources of information were social media and YouTube.

The impact of misinformation became apparent when discussing risk prevention campaigns. All participants claimed they had never heard of prevention campaigns, despite the recent launch of a Civil Protection initiative in Piedmont. This project, known as IT-alert, represents a new public warning system designed to provide direct information to the population. It sends important messages to mobile phones in a specified geographical area during imminent or ongoing serious emergencies or disasters. Once operational, it will address various risks in civil protection, including earthquake-generated tsunamis, dam collapses, volcanic activity (Vesuvius, Campi Flegrei, Vulcano, and Stromboli), nuclear accidents, radiological emergencies, and heavy rainfall.

The students acknowledged receiving the alarm on their phones but expressed fear and varied reactions. Some discarded their SIM cards, later replacing them, convinced they were being monitored by hackers. Others believed World War III had erupted, blamed the government for surrendering to the Americans, suspected something amiss, or simply dismissed the alert as ineffective. The prevalence of conspiracy theories can be attributed to the exposure to videos and social media posts where fake news, primarily for political purposes, has thrived in recent years. The intended impact of disseminating fake news is to erode trust and instil suspicion, as Mashamaite notes, "Public trust in political institutions affects people's civic and electoral behaviour, with doubtful citizens more likely to forego voting or support a populist candidate. While high levels of cynicism and distrust can lead people to disengage from politics" (Mashamaite, 2023, p. 190).

The discussion on climate migration provided valuable insights into how students, in the days between the end of the survey and the WebEx meeting, reflected on the topic and partially changed their opinions. While initially

only three students stated that climate was not a valid reason for emigrating, and 16 answered that they did not know, various doubts emerged during the discussion. Reception became a focal point, with comments such as “If people are escaping from climate issues, they shouldn’t come to Italy because it’s hot here too”, “EU aims to send all migrants to Italy as a way to dominate us”, and “Germany should keep climate migrants since it’s cold there”. Even when informed that Germany has more than three times as many non-EU migrants as Italy, skepticism persisted, highlighting the challenge of changing opinions once false information is accepted as true (Lewandowsky, van der Linden, 2021).

The overarching issue lies in the statement “I am not convinced”. This sentiment underscores a broader challenge: even within the university student community there exists a reluctance to readily accept information without personal conviction. Scientific research, once a compelling pursuit, seems to have lost its allure. In the absence of a natural affinity for science and a genuine enthusiasm for learning, misinformation, strategically crafted for economic or political gain, finds its way into the minds of future educators. This phenomenon is not incidental; regions with a higher susceptibility to misinformation also exhibit diminished awareness of environmental risks and reduced empathy for those currently facing such risks.

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Territories continue to transform due to endogenous and exogenous development drives. The thickening of logistics and transport networks, large commercial hubs, energy supply options, agricultural and industrial policies, tourism and migrations constitute then, individually and in a systemic sense, some of the lenses available to read the transformative dynamics of territories in the crucial current geopolitical context. In addition, the increasing reach of digital technologies in the spaces and practices of our daily lives, has changed the way we perceive and use the landscape. These transformations find a reified outcome in landscape transitions, becoming a foothold for a trans-scale geographical reflection. We therefore want to insert this volume on this horizon. In fact, we have wanted to stimulate the geographical community to try their hand at landscape analysis to identify, through methodological and/or applied research contributions, problems, practices and trajectories inherent in the transformative dynamics of territories, compressed between the urgency of development and the need to change the energy and consumption paradigm.

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