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Students' historicisation of the environmental crisis: A narrative of industrialisation, ignorance and greed

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ABSTRACT

As the field of history education begins to acknowledge the need to respond to the challenges of the Anthropocene, questions arise concerning students' ability to use history to make sense of pressing environmental issues. To address this, 67 Swedish upper secondary school students were asked to historicise issues like global warming and share their ideas concerning the present and the future. Within the framework of Jörn Rüsen's narrative theory, this article analyses how and to what extent these students experienced and interpreted the past and used history to orient themselves in relation to such issues. It also develops on the outcome of this process. While most students historicised the situation, many students made limited use of history. Their typical narrative can be described as a linear story of historical industrialisation driven by the hunger for progression and wealth and facilitated by ignorance. It was told with little detail or reference to evidence and in a way that generally seemed unsupported by historical thinking. Moreover, their typical narrative mostly aligned with the standard science-based Anthropocene narrative, lacking cultural and political perspectives. Although their orientations varied, students focused on technical solutions and lifestyle adjustments rather than civic engagement and politics. Students were worried about the future. However, the narrative of technological and scientific progression and the belief that people in the past lacked awareness and technological alternatives gave students hope. On the other hand, viewing them as informed or inherently selfish contributed to pessimism. Supported by theoretical work, the findings indicate ways school history may support students' ability to deal with Anthropocene issues, helping them to experience and interpret the past and the present in a more nuanced and elaborate way. They also highlight the need for content that aids students' ability to anticipate Anthropocene scenarios and reflect on strategies for engagement.

KEYWORDS

History education, Anthropocene, Historical consciousness, Historical thinking, Public narratives, Environmental and sustainability education

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Introduction

Environmental history has been a vibrant subfield of disciplinary history for more than half a century. And it has been well over a decade since works like Chakrabarty's seminal "Climate of History" (2009) sparked the historical Anthropocene debate, addressing the premise that Earth has entered a new epoch, defined by humanity as a planetary force. This debate is now the arena for competing narratives that feed from, and into, the public environmental discourse and history culture. Despite this, the field of history education has been hesitant to engage with the global environmental crisis and the Anthropocene and has only recently begun to address them theoretically. However, we still lack a basic empirical understanding of most aspects related to teaching history in a way that prepares students for grappling with the challenges of the Anthropocene.

This article aims to contribute to the understanding of how students use history to orient themselves in relation to Anthropocene issues, i.e., large-scale anthropogenic environmental changes. It presents examples of how students in Sweden's upper-secondary school narrate the emergence of the global environmental crisis and how this correlates with their views about the present and their prospects for the future. Furthermore, we hope to add to the discussion regarding school history's role in supporting action-oriented learning in the context of the Anthropocene. These goals intermingle as narrative theory and previous research guide the analysis, and the empirical conclusions feed the understanding of how history teaching might prepare students for dealing with issues such as climate change.

We ground our investigation in the concept of historical consciousness from the premise that people's perception of the relationship between the past and the present shapes their identities, how they experience and engage with contemporary issues, and their visions and feelings about the future. Analytically, it aims to elucidate the students' narratives by relating them to research and theories on historical thinking and teaching, environmental narratives, and narrative theory. The research questions are: i) How do students make sense of environmental issues by referring to historical content and formulating historical explanations? ii) How do students orient themselves in relation to their experiences and interpretations?

Previous research

In recent years, some contributions have opened the debate on the future of history education in the Anthropocene. In addition, research within environmental and sustainability education (ESE) and the environmental humanities (EH) offer insights and perspectives that can inform history teaching. Nevertheless, the potential of teaching school history in a way that engages with Anthropocene issues is only beginning to be explored (Hawkey, 2023), and much work is needed to decide on its priorities and methods. In particular, there is a lack of empirical research on the thoughts of students and teachers and viable approaches in history education.

Numerous studies have examined students' ability to engage with historical content and questions and construct historical accounts, mostly without emphasis on specific historical topics. This research has identified a range of conceptions and patterns common in students' historical

narratives. These can often be understood as "narrative simplifications" (Barton & Levstik, 2004, pp. 132–136) as students use familiar narrative structures to make sense of the past in ways that reduce its complexity and fill the gaps of the unknown.

A key finding is that many students personalise historical causation by viewing all events as explainable by someone's or something's intentions. Especially there is a tendency to attribute historical changes to the will of powerful people in a way that ignores structural conditions, unintended outcomes, and the interplay of various causes (Halldén, 1998; Lee, 2005; Lee & Shemilt, 2009; Seixas & Morton, 2013; Voss et al., 2001). In addition, this is often done without accounting for the actors' historical context and perspectives. Instead, students typically apply a universalist approach based on presentism when analysing and judging people's actions in the past (Lee, 2005; Lee & Ashby, 2001; Seixas & Morton, 2013). However, as Miles and Gibson discuss (2022), it is debated whether students' presentist perspectives should be considered problematic per se or whether they are something teachers should aim to improve rather than condemn. Furthermore, studies showing the impact of students' familiarity with the subject at hand indicate that their ability to apply historical thinking depends on their historical content knowledge (Huijgen et al., 2017; van Boxtel & van Drie, 2018).

Somewhat paradoxically, it is common for students who understand causality beyond personalisation to perceive historical events as inevitable without discerning possible alternatives. As a result, they often view history as a linear progression with no alternative outcomes and take the present situation for granted. Such an understanding of history is especially prevalent when students deal with processes over longer timespans. Various works attribute this lack of counterfactual imagination to an inability to comprehend how people's actions influence the trajectory of history within the limits of available paths (Lee, 2005; Lee & Shemilt, 2009; Seixas & Morton, 2013; Shemilt, 2000).

In ways that bring this strand of research closer to works concerned with historical consciousness and learning as "Bildung", scholars such as Barton, Levstik, and Seixas have discussed how students' historical thinking may influence their civic competence, ethical consideration, and orientation towards action. Barton and Levstik (2004) argue that school history should be aimed at qualifying students' ability to participate actively in a pluralist democracy. They recommend that students explore things such as multiperspectivity, complex causality, agency, and counterfactual history to advance their ability to make sensible decisions on policy issues and act on them. In ESE, such a focus on engagement is common. Moreover, multiperspectivity is a key feature of what Öhman and Östman (2019) call the pluralistic teaching tradition, aimed at supporting students' understanding of conflicting perspectives in the debate concerning environmental and sustainability issues and stimulating democratic deliberation.

Although we know of no study of students' historical narratives vis-à-vis environmental issues, there are comparable studies concerning other content. Lévesque et al. (2012) analysed students' historical consciousness of the nation through their narratives. Their study showed that the students' accounts were simplified and naive from a disciplinary standpoint but organised around different conflicting narrative templates they encountered in history culture. It also showed how the students framed their accounts within specific orientations. They concluded:

> Students seem to make use of those narrative templates because it provides them with an affordable tool to comprehend past complexities. These narrative simplifications serve also another practical function: it sets forth a temporal direction for situating oneself within the 'course of the nation'. (Lévesque et al., 2012, p. 58)

These findings indicate that it is critical to consider public narratives when analysing students' accounts and narrative processes and designing history education.

As discussed by Bonneuil (2015), every way of telling the story of the Anthropocene and the global environmental crisis points to the significance of certain actors, periods, forces, and phenomena while shadowing others, implicitly or explicitly making statements of causality and morality. Although it is not within the scope of this article to engage with the variety of stories

thoroughly, the works of Bonneuil and other EH scholars identify several competing perspectives in the academic and public debate.

According to this research, the standard narrative presents the Anthropocene as something late and rather unexpected: an unintended consequence of modernity and human progress, which revelation now works as an alarm bell to rally action. It challenges the nature-culture divide, plays out over geological time, and puts humanity as a global species at the story's centre. However, critics argue that this science-based narrative conceals ethical and political aspects of the planetary crisis necessary for dealing with it fairly and effectively. Instead, they emphasise things such as past negligence of early warnings, deliberate prioritisations, capitalism, colonialism and the uneven distribution of power and influence throughout history. Besides, despite growing consensus, the definition and time of entry into the Anthropocene are still debated. More critically, there are divides regarding the message of the Anthropocene story that feeds into the decades-old debate regarding system-immanent solutions – i.e., ecological modernisation – versus system change. For example, it can be interpreted both as a lesson of humility and vulnerability and about human exceptionalism and power (Bonneuil, 2015; Fagan, 2023; Fressoz, 2015; Gattey, 2021; Hamilton, 2017; Lövbrand et al., 2015; Simon, 2020).

Research within ESE has shown that many young people find it difficult, or impossible, to do anything to avoid environmental collapse, which can lead to despondency, apathy, and "eco-anxiety" (Kramming, 2017; Ojala, 2012, 2017; Pihkala, 2020). This sense of despair is often compounded by feelings of betrayal and neglect, especially in response to perceived governmental inaction (Hickman et al., 2021). Nonetheless, while the research is limited, studies indicate that students tend to focus on individual solutions – i.e., eco-friendly behaviour – rather than civic engagement and politics (Corner et al., 2015; Kramming, 2017, p. 167).

Several proposals about approaches to history teaching in the Anthropocene have been made, sometimes directly aimed towards encouraging engagement. Referring to the ideas of Barton and Levstik (2004), Waldron suggests a critical enquiry-based, multi-perspectival approach which, among other things, aims to deconstruct dominating narratives of progress and human mastery over nature, deals with historical responsibility and justice, and encourages commitment for change. She argues that teaching should actively counter defeatism by showing that "the future is still unwritten", offering alternative visions, and making a case for the importance of people's historical agency (Waldron, 2021). Similar ideas are advocated by McGregor et al. (2021). The latter also suggests that inquiries based on Seixas's framework for historical thinking (Seixas & Morton, 2013) are suitable for addressing the complexity of Anthropocene history and its ethical dimension.

However, the Anthropocene complicates attempts to engage with questions about agency, causality, and ethics relative to the environmental crisis. Environmental humanities research typically warns against the anthropocentrism of disciplinary history in favour of perspectives that include non-human agency and ethics (Emmett & Nye, 2017). Chakrabarty (2009, 2018) has famously stated that issues like climate change must be addressed from an approach that simultaneously considers processes on a planetary scale and the scale of modern history. Nordgren (2023) and Retz (2022) describe this as a challenging but critical aspect of teaching and narrating Anthropocene history. For example, as Retz points out, history education must handle that, depending on scale, humans are both a differentiated subject, exercising power in a sense traditionally examined by historians, and the unintentional cumulative planetary force of the sciences. This calls for approaches that integrate the "long story" and the "short story" of the Anthropocene, as Nordgren argues. Respectively, these authors point to Shemilt's (2000) and Hughes-Warrington's (2021) ideas on moving between scales and alternate narratives. Recently, Hawkey (2023) has also advocated such an approach.

Theoretical framework and methodology

The theory of historical consciousness has become an increasingly important theoretical paradigm for understanding meaning-making processes in history and the role of history education. Here, Jörn Rüsen's (2004, 2005, 2017) theory of narrative competence offers a tool for comprehending how students construct narratives to make sense of phenomena like climate change and how school history can advance this process.

In this article, we depart from his framework and its anthropological assumptions that we narrate our understanding of the past, the present and the future in order to make sense and meaning of the world around us and our place within society. This foundation does not imply that every individual holds a definitive or ultimate story that is cohesive with beginning, plots, and endings – on the contrary – these stories can be fragmentary and unfinished (compare Carr, 2001). Also, these narratives follow certain templates where collective memories are shaped in a complex socio-cultural interaction through society and its institutions, such as school (Lévesque et al., 2012; Wertsch, 2008).

Rüsen's (2004) framework focuses on three distinct, but interwoven characteristics of the process of narration: experiencing, interpreting, and orienting, often triggered by questions we pose as we face new situations or challenges. As history is all around us, we have both concrete and more abstract experiences to lean against, e.g., experiences from talking about the past with our grandparents or encountering past events in history class. In most cases, these experiences emanate from the life-world (Schutz & Luckmann, 1973), where our knowledge is interwoven with questions of identity and emotions that continuously form, and are formed, by our individual experiences. In turn, our previous experiences and knowledge are used to interpret what is being perceived in order to answer our questions. Our individual interpretations form representations that signify new understandings, which guide our actions in relation to the perceived situation. In other words, experiencing and interpreting societal phenomena provides the individual with new orientations on how to act and engage with the future. This repeating process is a natural part of our existence as we struggle to make meaningful narratives, and thus storify the social world when we express our understandings through communication. Consequently, the life-world becomes the foundation for students' perceptions and experiences as questions emanate from it.

However, processes in people's minds are not linear – we do not go from experience to interpretation to orientation and back to experiences – but rather go back and forth continuously as we build meaningful narratives to understand the world. It is therefore somewhat of a paradox to use Rüsen's framework as a model of the mental process of narration (cf. Johansson & Sandahl, 2023). Here, we use the steps of the narrative process as an analytical tool by separating them. This suggests that episodes of thinking can be described by concentrating on the components of experiencing, interpreting, and orienting. Although the staging will invite students to incorporate all three components simultaneously, we argue that focusing on certain aspects at a time is possible. Assuming that narrative competence may be analytically split into these components while considering its iterative power, we organise our study around this premise.

In Rüsen's (2005) theoretical framework, the life-world perspectives can be advanced by providing concepts, tools, and practises emanating from the discipline of history. In history education, such aspects have been described as historical thinking or first- and second-order concepts (Lee, 2005; Lévesque & Clark, 2018; Seixas & Morton, 2013). First-order concepts correspond to subject matter and the concepts linked to different content areas, while second-order concepts are the procedural ways that historians use to organise and interpret history. Seixas describes six procedural concepts: significance, cause-consequence, evidence, continuity-change, perspective-taking, and the ethical dimension (Seixas & Morton, 2013). In relation to narrative competence, scholarly perspectives can bring in new experiences with content and new, more powerful ways to interpret phenomena in order to advance students' narrative competence about the issue being engaged with in history education.

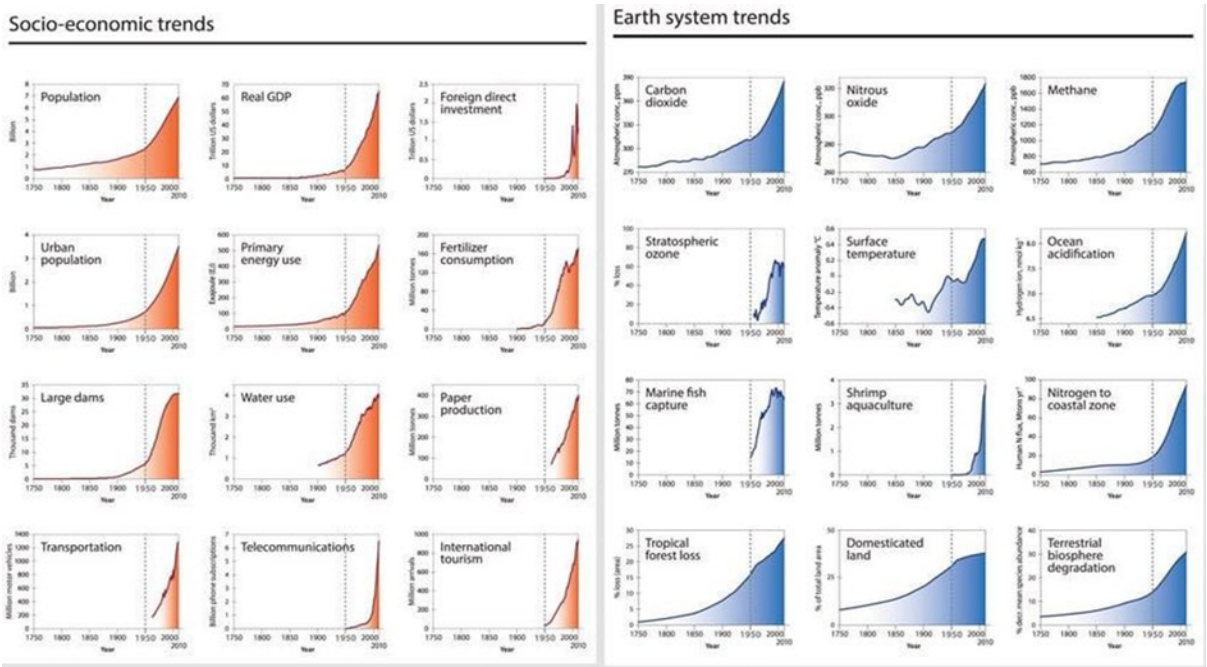
For the purpose of capturing students' narratives in our study, an elicitation task was constructed and answered by 67 volunteer students. An elicitation task, in this case a construction task, can be useful to get students to discuss topics they are not familiar with. Focusing on something external, such as visual, verbal, or written stimuli, allows participants to express their ideas and understanding of a particular phenomenon (Barton, 2015). In our case, students were asked three open-ended questions concerning how history might aid our sense of the present-day situation with accelerating environmental pressure, climate change, and biodiversity loss. This was done in the context of the following statement:

> We live in an era characterised by rapid global warming and the number of species becoming extinct or threatened. Both the average temperature and the loss of species are today at a level that exceeds the normal during man's time on Earth. Regarding the climate, the UN Climate Panel (IPCC) says that humans cause the current change and that we need to implement extensive measures in the next few years to stop it.

The questions were formulated as 1) How did we end here? 2) What do you think this situation will lead to in the future? 3) What are your thoughts on our possibilities to handle the problems it entails; will we succeed? Note that while this article describes this situation in terms of the global environmental crisis or the Anthropocene, such wording was avoided in the instructions.

The students were instructed to use their historical knowledge during the task. Moreover, to stimulate more precise arguments, they were presented with diagrams illustrating the loss of biodiversity and temperature changes from about 100 BC to 2015. An illustration from Steffen et al. (2015) showing the trends of the "great acceleration" was also handed to 27 of them (see Figure 1 below). This was done to allow an analysis of how this source affected the students' accounts.

Figure 1
One of the graphs used to elicitate students' answers



Note. The great acceleration (Steffen et al., 2015) shows the correlation between socioeconomic and Earth system trends in the modern period, highlighting the rapid changes since about 1950.

The participants were students from two upper secondary schools, having completed the common history course or were about to do so. Before the elicitation task, they had not received any teaching specifically designed to prepare them, i.e., teaching focused on environmental history. Of the 67 students, 43 attended the natural science program and 24 the social science program. The distribution between female and male students was 38/29, and they came from diverse socioeconomic and ethnic backgrounds. Our ambition was not to make universal assertions but to present illustrative examples of students' narrative process, thereby helping to discern how it might be advanced through history teaching. Therefore, the selection was not aimed at achieving statistical representativeness, but some heterogeneity was desired to promote a greater variety of responses.

Results

Students' experiences and interpretations of the environmental crisis

A central aim of the study was to investigate how students experienced and interpreted the past relative to the environmental issues exemplified. In other words, whether they had historical content knowledge that they perceived as meaningful in this context and how it earned this status through processes of interpretation. While some students did not suggest any explicit historical explanation, most historicised the current situation with different levels of detail and complexity. Students generally struggled to elaborate their arguments, and their suggestions often appeared speculative rather than grounded in historical knowledge or evidence.

The historical experiences students demonstrated in their answers were, not surprisingly, events in the modern era, and their narratives were intensely coloured by one specific event: the Industrial Revolution. Only two students dug deeper into the past, by contextualising industrialisation within a deeper trend of increasing resource consumption that they traced to the Neolithic Revolution. With its illustrations of rapid modern changes, the elicitation task most likely contributed to this temporal focus. However, the narratives and overall answers of students not presented with the great acceleration graphs did not deviate significantly from those who were.

Notably, while most students traced the emergence of the environmental crisis to modernisation, few engaged with the cultural dimension of this process. For instance, none touched upon ideas of modernity itself. Although some students mentioned the consumerism, economic liberalism and drive for progress and growth of modern capitalist societies, their historical explanations typically lacked cultural perspectives.

Students' interpretations were mainly based on what historians would define as causation, or in Seixas' version: cause and consequence. In our findings on students' specific narratives, we will focus on their causal analysis but, in some cases, on their use of other second-order thinking concepts. The vast majority of students viewed the breakthrough of industrialised production during the nineteenth century as the primary historical cause for the current environmental situation. When they mentioned other historical content, it was, in most cases, linked to the process and effects of historical industrialisation directly or indirectly. One example of both a direct and indirect linkage to the Industrial Revolution can be seen in the following excerpt, where the students mention Columbus's arrival in the Americas:

> But I think the main reason [for our present situation] was the Industrial Revolution because it created more swift and advanced means of transport and economic growth. Economic growth had a certain importance in increasing demand for goods. That meant that people had more money to buy goods and could transport them from different continents (long-haul transports also occurred from North America to Europe). This would not have been possible without Columbus' travels. (17)

Columbus' travels, or the following exchange, is not the central argument for this student but rather a way to connect the Industrial Revolution to prior events. Historical references like this were relatively common, but they were usually used to argue for the Industrial Revolution as the starting point and primary cause of the global environmental crisis. In turn, these experiences became important for the interpretations that students made in their narratives. The typical account can be described as a familiar basic narrative where industrialisation made mass production and mass consumption possible by rationalisation and the use of fossil energy, generating continuous emissions, pollution, and overexploitation of the planet. This indicates an interpretation of historical cause and consequence that was fairly direct and materialistic. This observation corresponds with the linear causal explanations described in previous research on students' historical thinking. Consequently, the path leading to the current predicament generally appeared straight, making the emergence of the crisis seem inevitable. However, in many cases, students' answers displayed a high level of complexity but in line with a basic and straightforward causality. The following excerpt exemplifies one of the most complex but still rather typical accounts:

> A historical event that contributed to the increase in the Earth's average temperature and to the loss of many species was the Industrial Revolution at the end of the 18th century. That's because numerous factories were built for mass production using new machines. These were not environmentally friendly, partly due to a lack of knowledge about how they affected the environment and because rules and laws for this did not exist at the time. The revolution led society to move from an agricultural society to an industrial society, where mass production began, and environmental impact was not a discussed topic. This led to a large amount of CO2, and other greenhouse gases being released into the atmosphere in a short period of time. (4)

This student continued reasoning about this causality, how it escalated in the later stages of Western industrialisation, and how a growing population made things worse. These kinds of arguments, where students linked industrialisation to globalisation and population growth (one or both) by describing them as phenomena that reinforced industrialisation's adverse environmental effects, were common. Some students also highlighted the importance of specific environmentally harmful innovations, primarily fossil-powered transportation.

Students' historical accounts rarely considered human agency and politics. When they did, it was mainly implicit and not substantiated with references to specific historical content knowledge. A few students sweepingly referred to the historical significance of powerful politicians and corporations – i.e., personalising historical events – or considered the role of inventors and scientists. A few students also drew connections between the environmental crisis and past conflicts and power struggles – e.g., the Cold War – arguing that they had diverted humanity's focus from environmental and sustainability issues or that modern wars and weaponry have contributed to global warming and the extinction of species. Again, while some of these propositions may be viable, they were usually made without supporting historical examples and more of a motif for agency, rather than agency itself.

In some instances, students claimed that the environmental crisis was motored by greed, hunger for power or the pursuit of ever-greater wealth. This was generally done in a way that treated these traits as part of human nature. Still, others historicised such motives. Some argued that structural conditions associated with industrialisation, like capitalism, have led to an ego-driven culture centred around consumption and material wealth that neglects environmental concerns. One student suggested the significance of the psychological effects of scientific and technological progress at the brink of the nineteenth century and onwards:

> I think inventors and scientists became addicted to making these inventions and discoveries because of the results they got. It was a new type of success not seen before, and this blinded them to the [negative] consequences. That's how I believe we ended up in this situation. Even today, we humans are addicted to

> constantly outdoing each other and coming up with new inventions without a clear understanding of the consequences that very clearly follow these inventions. The biggest event that gave humanity a small idea of what we are capable of with machines and these discoveries, I think, was when electricity was generated or when various nuclear power plants and factories came into being. We never really thought about the significant impact these factories had with their large carbon dioxide emissions (44).

Students gave some examples of historical perspective taking, typically arguing that people in the past lacked the knowledge that we have today. As we shall return to, this prominently shaped their narrative process. The two extracts above exemplify how many students claimed that people were unaware that their actions or technology harmed the environment or, at least, underestimated these effects. The first extract also shows how the student complements this idea by further contextualising the practice of harmful manufacturing techniques, adding that there were no legal restrictions against it at the time. On the other hand, some students stressed that environmental issues had been neglected or under-prioritised in the past, implicating that, at least in some contexts, people were aware but put their priorities elsewhere. One explicitly claimed that " scientists have been warning about temperature increases since the 20th century. If we had taken the problem seriously, we would not be in the situation we are in today" (27). In this sense, several students expressed that it is essential to consider the agency of past humans, their conflicts of interest and political decisions to make sense of the environmental crisis. Still, students' historical accounts generally did not address human agency, and events just "played out".

In summary, students' experiences and interpretations of the environmental crisis can typically be described as a linear story of historical industrialisation motored by the hunger for progression and ever-greater wealth and facilitated by ignorance, where each historical event contributed to a deepening of the problems. It was told with little details or reference to evidence and in a way that often seemed unsupported by disciplinary or civic historical thinking. In the final section, we will return to how teaching may expand students' experiences and advance their interpretations in relation to the task of historicising the environmental crisis.

Students' orientations towards the present and the future

In line with Rüsen's (2004, 2017) notion of narrativity, narratives are not complete without some sort of supposition, i.e., an orientation towards understanding the issue at hand. The elicitation task asked students to predict the consequences of continuous global warming and biodiversity loss and the prospect of handling it, which was our way of stimulating orienting answers. The analysis focused on the students' projections, their identification of opportunities and obstacles, and their level of optimism and pessimism. Moreover, specific attention was paid to the nature of solutions and engagement envisioned by the students. Naturally, this was done while considering how they experienced and interpreted the past.

In students' answers, there were often apparent links between how they historicised the situation and how they viewed the present and the future, making their reasoning coherent; aspects described as historically significant were also described as significant today. For instance, students who historicised the crisis by referring to past conflicts or greed could later state that people must make peace and overcome their selfishness to solve the present situation. Additionally, some students explicitly presented historical arguments to support their views. One prominent example was a student who discussed Alfred Nobel's efforts to stop wars as he saw the consequences of his invention. This historical example became important in this particular student's orientation:

> All decisions, all wars and all developments that we humans make influence where we are today and where we are heading. However, there are people who think of others besides themselves and attempt to make up for mistakes, and this gives me hope [...]. After all, we humans have created nuclear weapons that can destroy countries in seconds, and we have managed to travel to space, so why

> should we not be able to stop climate change, CO2 emissions, etc. […] If selfish rich people are willing to improve the world and not be so obsessed with their wealth, it can be a better place. Then all countries can cooperate and find common solutions to, for example, make electric cars cheaper and use other stuff (sources) to produce energy, and we can collectively make the world a better place (67).

However, regarding the future consequences of global warming and species extinction, we found no examples where students' assessments seemed influenced by historical experiences. Instead, they sometimes invoked other experiences, such as encounters with media reports, both regarding the risks associated with these issues and their general argumentation.

Students' orientations towards the future were rather heterogeneous, but most shared some general positions. Most evident, all agreed that global warming and biodiversity loss were alarming and would cause severe future consequences if they continued. Their predictions ranged from severe species loss and generally harsher human conditions to the extinction of most species, including humanity. Few specified a timeline for these predictions, but it is noteworthy that none explicitly discussed a future more distant than a few generations ahead. Despite these scenarios, most students were relatively optimistic about a brighter future. They expressed that it was possible to turn the negative trends, primarily putting their hope in non-fossil technologies like solar energy and electric cars. Several stated that, unlike people in the past, people today know how we affect the planet and have the scientific and technological knowledge to opt for a more sustainable future. One student wrote:

> With the help of innovative, environmentally friendly technology and conversion to sustainable energy sources, it is possible to counteract climate change. This way, we can continue developing our technological society without affecting the environment. The increased environmental awareness means that people choose organic and natural products and thus contribute to a better climate (31).

However, several students claimed that the problems had grown too severe to handle or that the necessary changes would not take place. Many articulated that technological development is not enough to solve the situation. These students generally argued that lifestyle changes perceived as sacrifices would be necessary, and some voiced system criticism and a need for more radical change. In this line of reasoning, the main obstacle was that people tend to prioritise personal wealth and comfort. This generally appeared as a common human trait or cultural predisposition, but some students particularly pointed out the greed of companies, states or politicians. Here, students were mainly occupied with actors rather than structures. However, some students directly considered structural barriers, for instance, by arguing that economics and fear of public reactions sometimes prevent politicians and industries from taking adequate actions.

There was no absolute correlation between how the students narrated the situation and if they believed it would be managed, and not everyone took a clear position on this. However, in general, students who primarily described it as an issue of technological capacity and awareness were more optimistic than those who mentioned structures. The student above (31) is a rather typical example of the technical optimist. The following excerpt shows a more pessimistic orientation (but not without hope). This student claimed that for a long time, people did not know that carbon dioxide emissions caused global warming, but when this was established by science, that did not affect our emissions. She later argued:

> I think we have a good chance of solving these problems as it is still not too late to redo and do it right. However, I don't think we'll really try until it's too late. I think that's because these companies make too much money from it. The same applies to us consumers. We have created a lifestyle with many habits that require these companies to continue producing goods/services. We, consumers, are unwilling to let go of the simplified everyday life with all these pleasures we have created for ourselves. It is very selfish, but we humans have it in our nature to let lust take over consciousness regardless of the consequences we are very

> aware of. The solution is to stop emitting carbon dioxide and stop destroying nature, which is a resource for these factories, for example. But I don't think that will stop, as I said, as the economy would collapse if there were no goods/services to sell; thus, almost the whole world would lose their jobs (44).

These two examples also illustrate how students' interpretations of what people in the past knew – taking historical perspectives – also shaped their individual orientations. While the first student suggests that increased environmental awareness will make a difference, the second argues that the problems have been known long enough to disprove this. This conclusion leads her to search for explanations, and she finds that human greed and the functioning of the economic system provide an answer.

Even though these two excerpts represent somewhat different orientations, both students shared some rather typical views. For example, both pieces exemplify how the students generally emphasised that ordinary people can contribute through lifestyle changes and as conscious consumers, instead of discussing the prospect of, for instance, collective political engagement. While many expressed that the ultimate power over the situation lay in the hands of the industry and policymakers, few seemed to consider or believe in ways of directly influencing these actors or people in general. Although the student above (44) represents a more system-critical perspective, the student does not discuss collective political action or engagement. That is, students struggle to identify or believe in civic strategies or alternatives outside their perception of the current system. We are doomed since we are what we are:

> When it comes to climate change, not much can be done about it because we are consumers and cannot stop ourselves from increasing in number or consuming, and it is not possible to stop companies (8).

Students were generally preoccupied with this view of humans as consumers, which reflects how they historicised the crisis. This may also have contributed to the fact that the ethical dimension of the past was typically absent in their reasoning. While the task did not explicitly encourage the students to consider this, it is noteworthy that none discussed historical accountability, and few engaged with ideas of differentiated capacity and responsibility to bring about necessary changes. Instead, it was common to argue that the situation demands global cooperation and the efforts of politicians, individuals, and enterprises alike. However, several stressed that the prospect of a brighter future now depends on a few large countries, like China, India and the USA, due to their massive populations and production. This view was sometimes accompanied by the idea that the actions of others were insignificant. In this sense, politics also focused on actors rather than structures.

Conclusions and discussion

In this article, we explored upper-secondary students' historical consciousness concerning the global environmental crisis in terms of narrative competence. The results indicate that many students have explicit but limited historical experiences that inform their efforts to make sense of the situation. In this case, these experiences concerned modern events and processes, typically focusing on historical industrialisation and the emergence and expansion of techniques and activities directly associated with climate change and biodiversity loss. They also drew on history to explain the driving forces behind this ongoing process and why it has been allowed to proceed. Moreover, a few students invoked historical experiences to illustrate lessons learned about human or technological potential. Despite the instructions, history often played a relatively marginalised role in students' responses. Instead, many were characterised by common-sense reasoning or primarily informed by experiences within other areas of knowledge, such as media and public debate.

Students' historical experiences were interpreted by reasoning about *causes and consequences*, taking the *historical perspectives* of people in the past, and, in a few instances, using sources. This was generally unelaborated, and students' explanations typically focused on basic aspects of technology, economics, lifestyle and demographics. Many did not go beyond pointing out mechanistic connections between the rise of industrial production or mass consumption and environmental degradation. Although several students presented more complex historical explanations that required a broader set of substantial knowledge and procedures, they generally remained within this focus.

Students' orientation towards the future varied between hopefulness and despair but were somewhat leaning towards optimism, despite being troubled about the future. Their historical experiencing and interpreting usually aligned with their reasoning about the prospect of handling the crisis and were sometimes part of it. However, none drew on history to predict the consequences of the current predicament, and other experiences generally played a more explicit role. Nevertheless, a few narrative aspects seemed to shape students' orientations prominently. In many cases, the narrative of technological and scientific progression, and the belief that people in the past lacked better alternatives, gave them hope that technology and human ingenuity would help us. Students' perceptions of past people's perspectives on their environmental impact also seemed to influence their orientations distinctively. Perceiving people in the past as ignorant or unaware contributed to optimism. On the other hand, viewing them as informed or inherently selfish contributed to pessimism. In other words, students recognised the need for change to save the future, and perceiving the present conditions as different from the past was associated with a more hopeful orientation.

Students' orientation towards action primarily centred on people's potential contributions in terms of lifestyle changes and conscious consumption rather than civic engagement. Moreover, they did not seem to believe in the prospect of fundamental societal transformation. This reflects the typical historical narrative that lacked political causes, alternative perspectives and civic agency and where people appeared primarily as a growing global collective of consumers. Students' historical accounts did not cover political processes or decisions, and to the extent that politics was mentioned, it appeared distant from ordinary people.

Our analysis of student causal explanations aligns with patterns identified by previous research on historical thinking. Students tended to narrate the environmental crisis in simplified ways, without accounting for the complex interplay of causes and their differing nature. In this case, few students personalised historical change. Instead, many explanations were linear and materialistic, making the crisis seem inevitable. Moreover, they often appeared speculative, especially when diverging from the typical storyline.

Previous research has shown that students' historical accounts often rely on familiar narrative structures and their understanding of human nature, especially when lacking adequate knowledge of past events (Barton & Levstik, 2004; Lévesque et al., 2012; Wertsch, 2008). In this case, this appears to be a likely element of many answers. Likewise, the somewhat unexpected centrality of modern wars and conflicts in several students' narratives may be explained by their prominence in school history, making it natural for students to seek connections between them and current issues.

Students' narratives were inclined towards some predominant forms. These, we suggest, reflect common narrative templates among students. Most noteworthy, they typically centred around elements recognisable from the dominant Anthropocene narrative – or variants thereof – described by EH scholars (Bonneuil, 2015; Fressoz, 2015; Lövbrand et al., 2015; Simon, 2020). This is a narrative that says that: 1. humanity at the species level created the crisis through 2. the rise and expansion of fossil-based industrialisation, in synergy with globalisation, population growth and economic development, 3. thanks to science, humanity is now environmentally conscious, 4. this awakening creates an imperative for joint global action, 5. leaders now have to let scientists guide transformation, typically focusing on technological solutions and market incentives. However, this does not imply that students' narratives typically contained all these elements. Nor does it exclude that several answers shared elements with narratives described as

alternative. Clearly, this was the case regarding students who challenged the progressivist belief in the novelty of environmental awareness and technological solutions. In addition, students' narratives lacked the deep time setting of the Anthropocene.

As noted, there is a common scholarly critique that the standard narrative is based on a "post-social", "post-political" ontology that works against public mobilisation (Lövbrand et al., 2015). Moreover, according to Bonneuil (2015) the dominating way of narrating the past, present and future of the environmental crisis does not consider bottom-up initiatives or the struggle of the environmental movements, describing society as passive and in need of guidance. From the perspective of action-oriented history education, this is noteworthy, as references to such experiences were also absent in students' answers and students typically did not recognise how people like themselves could take action beyond their role as consumers. Here, our finding mostly aligns with those of Kramming (2017), who also identifies a connection between students' perception of their insignificance and feelings of despair. In this sense, the standard narrative stresses the need for action but offers little guidance to students seeking practical ways to do so.

Although it is not surprising that all students do not delve into every angle of an extracurricular research task, our findings suggest history education's potential to advance students' ability to engage with the environmental crisis. As noted, the interpretive dimension of students' narrative process cannot be analysed in isolation from their experiences. Instead, their ability to formulate well-developed historical explanations must be understood as an interplay between their substantive knowledge and analytical skills, i.e., their practical understanding of historical first- and second-order concepts. While a sophisticated explanation presupposes both substance and analytical ability, a less-developed explanation may be due to a lack of either or both. Nevertheless, we believe that the results indicate that many students lacked the basic historical literacy required to formulate meaningful and substantiated accounts. But even those who displayed a more developed capacity would benefit from a broader set of historical experiences in relation to the subject, thereby allowing them to formulate the richer and more nuanced narratives necessary for a more qualified capacity for orientation.

Implications for history teaching

In short, the study suggests that school history may play a vital role by exploring content that enables students to ground and develop their historical narratives on a disciplinary basis, including historical content outside the spectrum of students' typical experiences. Moreover, there is a need for historical experiences that can aid students' construction and assessment of future Anthropocene scenarios. This certainly must imply somewhat interdisciplinary content that challenges the traditional scope and anthropocentrism of history as a subject. However, our results strongly indicate that teachers should not disregard history's traditional disciplinary contributions to learning, such as providing cultural and political context. Not least, it seems wise to include content that helps students reflect on different visions and strategies for engagement. Here, we think several of the suggestions from civic-oriented history educational research are viable but warn against going too far down the trail of normative teaching.

Regarding students' interpretive ability, the results highlight the importance of advancing their capacity to engage with the concepts of cause-consequence and perspective taking but also history's ethical dimension and the importance of deliberating on environmental and sustainability issues (Öhman & Östman, 2019; Seixas & Morton, 2013). The results also indicate that exploring past people's perspectives relative to our own is a powerful way to introduce historical content and engage with questions emanating from students' life-world. Another layer of interpretive depth might also be added by directly exploring the use of history in the environmental debate by pointing out and critically examining competing narratives. In this way, teachers can help students discern how history culture influences how we deal with Anthropocene issues, thereby influencing the future.

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