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On the Limits of Empirical Ecocriticism: Empathy on Non-Human Species and the Slow Violence of Climate Crisis

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ABSTRACT

The impact literature has on its readers has recently become a topic of interest to an increasing number of literary scholars who contemplate the relationships between environment and fiction. Empirical ecocriticism is a relatively young sub-area of ecocriticism where the empirical methods of social sciences are applied. This article discusses two major areas in empirical ecocriticism: the emotions evoked by both the representations of non-human species and climate literature. The focus is not solely on the premises of empirical ecocriticism but also on the often-conflicting results it has produced. By presenting critical observations on its limits so far, the article proposes outlines for further development of empirical research on environmental fiction.

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How could literature help slow down environmental degeneration? Indian author Ghosh (2016) has reminded us that the climate crisis is also a crisis of culture and imagination and has encouraged writers to envision possible futures. If we cannot even imagine alternatives to a world based largely on fossil energy, we will continue until our own destruction. Recently, global environmental issues have in fact been a prominent topic in contemporary Western literature, while the violent relationship between human and non-human has become one of the most important ethical issues in literature.

From a literary criticism perspective, concern over natural disasters is not new. In the late 1990s, early ecocritics started to make demands that fiction should participate in solving global environmental issues (see Buell 1995; Love 2003). These suggestions are based on the notion that as part of a wider environmental imagination, literature can stimulate readers to recognise approaching crises or evoke compassion towards other species. The most radical comments expressed the wish that literary scholars should participate in solving the climate crisis by studying descriptions of nature (e.g. Kerridge 1998), whereas more conservative voices warned against returning to a perception of literature that is dominated by simplified assumptions about the relationship between the real and the imaginary (e.g. Phillips 1999).

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Since the early stages of ecocriticism, its focus has been on the environmental and societal relevance of representations. In *The Value of Ecocriticism* (Clark 2019), Timothy Clark sees the strength of ecocriticism in the very fact that it emphasises the roles of culture and imagination in the environmental crisis and reflects on the significance of cultural representations in discussions about the environment. On the other hand, Clark states that this might be an academic weakness: ecocriticism may even have utopian starting points, since it may give representations more value than they ultimately have in terms of decision-making. Although fiction can help us understand large-scale change, its impact in changing values on a broader scale may be less significant than expected or hoped (159).

The challenge presented by Clark, among other scholars raising similar issues, has not gone unnoticed by ecocritics. Lately, there has been a tenacious pursuit by ecocritics to utilise the empirical methods of social sciences and explore the environmental impact of literature. This fresh field of environmental humanities has become known as empirical ecocriticism. It stems from traditional ecocriticism, but its goal is to use empirical methods to test claims (that are often based on close reading) about the benefits of stories. Mainly it is interested in how stories dealing with the environment and its state influence readers' consciousness, attitudes, and possibly also behaviour in an epoch that is characterised by quick environmental change. The first comprehensive, eponymously named anthology was published in 2023, introducing the interdisciplinary form of empirical ecocriticism and focusing on the manifold and complex reception, as opposed to the often-abstract ideal reader constructed in literary criticism (Schneider-Mayerson, Gustafson, et al. 2023, 179).

The basic question is simple in formulation but complex in its contents: how does literature affect the way readers live and act in the world? In this article, we discuss the value of empirical ecocriticism in evaluating the effects of literature dealing with climate change. We discuss the strengths and weaknesses of empirical approaches to readers' affects and focus on the often sporadic and conflicting interpretations obtained by ecocritics. Finally, we present critical observations on the limits of empirical ecocriticism so far and propose outlines for further development of empirical research on the climate literature.

The rise of empirical ecocriticism

As climate change has progressed, the impact of literature has been discussed in different areas of literary studies. The debate around the benefits of reading has mostly been dominated by binary thinking. Highlighting the positive effects has been related to the increasing need of humanist researchers to defend the significance of their own field of research as literacy levels are deteriorating and reading as a hobby is diminishing in Western societies. Some researchers have claimed that literature improves readers' capacity for self-reflection and empathy, based on research results in cognitive science (see Nussbaum 2010), whereas others have cited the aesthetic autonomy of art and also warned against the unwanted effects of stories (see Bloom 2016). Similarly, an interest in testing the assumptions of literary scholars about the impact and political effects have increased among ecocritics (see, e.g. Heise 2023, 311; Schneider-Mayerson, Weik von Mossner, et al. 2023).

From the very start, ecocriticism has been based on an instrumental concept of literature as having a major impact on readers and the world. This has served as the basis for ecocritical close reading, where the meanings given to the environment and nature in different texts are considered. It is used in an attempt to enrich understandings of humans' ecological ties, and to investigate the limits of human understanding. Since the 1990s, the field of ecocriticism has investigated how descriptions of nature and metaphors related to it might affect humans' relationship with the environment or their anthropocentric values, but regardless of the conclusions being optimistic or sceptical, they were based mostly on intuition, speculation, or fragmented data (see Schneider-Mayerson, Weik von Mossner, and Małecki 2020, 327–328; Schneider-Mayerson, Weik von Mossner, et al. 2023, 7). This unverified power of literary representations, questioned by Clark (2019), also exposes other fields of literary and cultural studies to fundamental criticism.

However, the effects and cognitive benefits of reading is not a novel topic in literary studies. Reception of literature has previously been studied in so-called reader-response research whose liveliest period was from the 1970s until the 1990s. As Matthew Schneider-Mayerson introduces the premises of empirical ecocriticism in his pioneering article on the influence of climate fiction, he connects new ways of phrasing questions to the very tradition of reception research and its antiformalistic approaches which emphasise the significance of reading in the meaning-making process (2018, 475–476). Although the major reader-response theorists did not necessarily exercise empirical research themselves, their interest in readership has preceded contemporary research frames that describe reading experiences and whose objects of interest are often cognitions, affects, and empathy (Małecki et al. 2019; see also Sopcak and Nicolette 2023).

Empirical ecocriticism is connected to the so-called affective turn, which made researchers focus on the experiential nature of reading and the emotional effects of fiction (e.g. Bladlow and Ladino 2018; Clough 2007). In the field of ecopsychology, the emotions caused by global problems, such as the fear of nuclear holocaust, have been under scrutiny for decades, but the interest in environmental feelings within literary research did not spark off until the turn of the century, along with increasing ecoanxiety. Earlier, the research on affective impact was primarily based on observations made in neuro and cognitive studies or assumptions based on researchers' own experiences. A major initiative within ecocriticism was Alexa Weik von Mossner's *Affective Ecologies, Empathy, Emotion, and Environmental Narrative* (Weik von Mossner 2017) that creatively combines cognitive science and narratology. Although Weik von Mossner's study is not based on empiric data, its thesis can be regarded as significant for empiric ecocriticism. While addressing the readers about the disasters and suffering caused by the environmental crisis, the environmental narratives appeal to their sensory perceptions, embodied cognition, and emotions.

In the introduction of *Empirical Ecocriticism*, the editors of the anthology portray this as a multidisciplinary area of research, which draws from both ecocritical literary studies and environmental communication. Whereas communication studies primarily focus on journalistic texts, the main subject of empirical ecocriticism is fiction, films, theatre, video games etc. Indeed, empirical ecocriticism differs from communication research in that it investigates the formal and aesthetic means and features of literary expression, such as genre, narration, fictionality, or the construction of the protagonist. In addition, empirical

ecocriticism combines textual analysis with sociological and empirical methodologies. Empirical ecocriticism not only enriches environmental communication with a more versatile corpus but also with ecocritical theory that has been developed over the past three decades by literary scholars and environmental humanists (Schneider-Meyerson, Weik von Mossner, et al. 2023, 13–15; Schneider-Mayerson, Weik von Mossner, and Małecki 2020, 328–329).

The formulation of research questions about empirical ecocriticism and its connections to environmental communication leads us to reflect on literature on a conceptual level: what is the societal significance of literature and how does it address its readers? There is a valid reason to criticise ecocriticism for an instrumental (and therefore narrow) understanding of literature, but as the editors of *Empirical Ecocriticism* propose, during the existential crises of today, maybe instrumentalism should not be regarded as a pejorative term. Perhaps, indeed, the instrumental value of literature should not be understood as reducing its value as art. Previously, researchers of environmental humanism have roughly been divided into two groups, of which one focusing on the narratives that are considered to save the world, so to speak, and the other group on the anthropocentrism and human limitations of narrating in general. In practice, the line between these two objects of interest is blurred. Nevertheless, empirical ecocriticism is not so much interested in how certain texts should be understood but how they are actually read and interpreted (Schneider-Mayerson, Weik von Mossner, et al. 2023, 11).

Next, we will move on to discuss two major areas in empirical ecocriticism: firstly, the emotions evoked by the representations of non-human species in readers, and secondly, climate literature's effects on its readers. This division is not mutually exclusive since, for instance, climate literature often deals with descriptions of the sixth mass extinction. The objective of the following is to map, review, and discuss the results of empirical ecocriticism thus far.

Non-human species, empathy, and identification

While digital pastime has eaten into literature's popularity, there has been an attempt to prove the significance of recreational reading with its benefits of enriching civilisation and emotional life (e.g. Meretoja 2018; Nussbaum 2010). The optimistic view that fiction enhances readers' understanding of other people's beliefs and desires was popularised, albeit controversially, by Kidd and Castano's (2013) study. Although it has been criticised for providing little evidence, there has been wide-spread news based on it stating that literature enhances readers' emotional intelligence (see Currie 2016, 56–57; also; Mar and Oatley 2008). From the ecocritical perspective, the most interesting aspect of this discussion deals with empathy towards other species and victims of environmental injustice: can literature reduce animal and human suffering or prevent climate change and biodiversity loss?

Ecocritical discussions on empathy towards other species lead back to claims that reading could develop one's ability to see the world also through the perspective of marginalised and oppressed people (e.g. Goodbody and Adeline 2019, 7–8; Nussbaum 2010; Małecki et al. 2019; Meretoja 2018). Like Małecki et al. remind us, the link between human rights and animal rights is tight: the animal rights movement of the 1970s was based on the comparison between animals and oppressed groups of people. The concept

was popularised by Peter Singer's classic *Animal Liberation* (Singer 1975), where the oppression practiced towards animals ('speciesism') was presented as a phenomenon comparable to sexism and racism. Singer's aim was to demonstrate that justifying animal suffering with the fact that they belong to another species is comparable to situations where human suffering would be justified by racial, ethnic, or gender differences (see Małecki, Weik von Mossner, and Dobrowolska 2020, 366–368).

In the often-cited *Empathy and the Novel* (Keen 2007), literary scholar Suzanne Keen states that empathy is experiencing some other person's feelings – or to be precise, feeling what we believe to be the emotions of others. Generally, when we speak about empathy it is mostly related to negative feelings, but it is equally possible to feel empathy over positive feelings, such as happiness, joy, contentment, or sexual arousal. When writing about reactions evoked by stories, Keen refers to 'emotional contagion', or communication between feelings, as some sort of in-built human characteristic but states that experiencing these shared feelings always depends on one's personal history and cultural context. Instead of human, Keen reminds us, the target of empathy may equally be non-human, such as an animal, since the readers' empathy requires only minimal elements of identity, situation, and feeling (5–6, 68–69).

In empirical ecocriticism, as often in literary studies in general, the persuasive power of narrative is located in the process of identification; readers' emotional connection to characters in the narrative requires a certain amount of similarity between the two (see Schneider-Mayerson 2020, 348–349; Schneider-Mayerson, Gustafson, et al. 2023, 123–124). However, in an empirical research study in which Finnish upper secondary school students read Emmi Itäranta's internationally acclaimed novel *Memory of Water* (Itäranta 2014; published as *Teemestarin kirja* in 2012), a dystopian story that takes place in dry and barren northern Europe, one of the most fascinating findings was the reluctance of the students to identify with the protagonist or feel empathy for them.¹ In other words, emotional contagion did not occur. The research showed that the identification does not necessarily occur with characters, but instead, many of the students seemed to identify with the story-world that was suffering from severe drought (Helle et al. 2024; see also Schneider-Mayerson 2018, 478; Keen 2007, 93).

The main focus in empiric studies so far has been on anthropomorphic depictions of animals, and some studies on narrative impact indicate that fiction dealing with animal suffering can indeed affect readers' attitudes towards other species. According to Małecki's research group (Małecki et al. 2019), the most effective descriptions of animals, similarly to descriptions of oppressed groups of people, are stories of suffering individuals which draw readers' attention to wider problems. The most well-known example is Anna Sewell's novel *Black Beauty* (Sewell 1877), which was also read as an allegory of slavery in the United States. The book had a historical impact on animal welfare – for example in Great Britain, bridles that caused pain to horses were abandoned (see Guest 2011). A similar case can be found in Finnish literature: Yrjö Kokko's novel *Whooper Swan – the Bird of Ultima Thule* (published as *Laulujoutsen – Ultima Thulen lintu* in Kokko 1950) has often been credited for saving the whole species from extinction (e.g. Aholainen 2020; see also Małecki et al. 2023). The compassion evoked by Kokko's novel can be partly explained by its cultural and literary context: saving the bird that has served as a popular reference both in Finnish folklore and nationalistic poetry symbolised to many readers the nation's painful recovery and reconstruction after the Second World War.

A horse and a swan are apt examples of species that evoke more positive feelings in humans than others. Indeed, for environmentally orientated literature, there is typically one so-called flagship species representing a whole ecosystem. These are often fluffy, big-eyed, or charismatic mammals who appeal to people with their beauty (e.g. Huggan 2016; Jepson and Barua 2015; Rahn 1995). According to Małecki's research group, *Black Beauty* is a well-known example of books that have reinforced empathy only towards certain animal species but not necessarily more broadly towards the animal world (Małecki et al. 2019, 120). Małecki's group – with varying compositions – has also observed that equating animal and human suffering can have an inconsistent effect on readers' attitudes. Recent reading surveys on Alice Walker's 'Am I Blue' (Walker 1988) – which metaphorically links a fate of a horse and enslaved humans – appear to imply that drawing a parallel between animal and human suffering may also weaken some readers' positive attitude for non-human species (Weik von Mossner et al. 2023, 196–200; see also Małecki et al. 2018). In addition, strong anthropomorphisation of non-human nature does not evoke empathy in all readers – on the contrary, it may also annoy and alienate readers from the environmental ethics of the text (Małecki, Weik von Mossner, and Dobrowolska 2020, also Małecki et al. 2019; Toivonen 2022).

These two aforementioned historical examples, *Whooper Swan* and *Black Beauty*, reveal some limitations of empirical testing in explaining literature's influence on reception. The empirical study may easily overlook the historical and cultural contexts of the texts. As literary critic Currie (2016) notes, no generalising statements based on individual works of literature should be made nor should the effects of literature be simplified: the momentary empathy evoked by literature is not necessarily directed in a desirable way, and empirical evidence does not yet show that literature could affect conscious regulation of empathy, or harness it for the benefit of some moral activity. Literature may equally evoke empathy towards imaginary – and most often individual – characters, but it may not have any concrete consequences in real life, and therefore it could weaken the link between empathy and helping others (58–59; see also Bloom 2016). In this respect, empirical ecocriticism should not, in its pursuit for positive impact of literature, ignore the fact that literature does not necessarily promote morality.

Considering these occasionally conflicting results of research on the impact of reading, it is no surprise that there has been vehement discussion on claims that fiction is more effective than non-fiction in making readers imagine someone or something else's point of view. According to Meretoja (2018, 4, 126–132), literature can indeed widen one's perspective-sensitivity, but it does not necessarily lead to ethical action. Readers' responses in empathy tests do not reliably reflect whether reading will really make them act more ethically than before. Meretoja's criticism is partly based on Keen (2007), who states that ideas of fiction's practical effects on increasing empathy and altruism are often exaggerated claims, used to justify the benefits of reading. Keen also questions the much-debated causality between reading and empathy: do empathetic people become good readers or do good readers become empathetic people (xv)?

Climate literature and slow violence

As ecodystopias have gained popularity, ecocritics have reflected on how climate change should or could be presented in fiction. For example, do Hollywood's entertaining disaster

stories, where the world is saved due to a hero's actions and spiritual growth, feed into a false sense of security in their audience? How can classic story templates and genres be applied to such a complex and wide-ranging phenomenon as climate change (e.g. Kerridge 1998, 4; 2013, 371–373)? Physical violence directed at animals, such as hunting or factory farming, is a more easily conceivable phenomenon than climate change and its multifaceted consequences that challenge the limits of human understanding.

Lately, the wide-ranging environmental destruction as the result of so-called 'slow violence' has been a keen interest of many ecocritics. According to Nixon (2011, 2–3), slow violence is gradual and therefore its effects are almost imperceptible in terms of time and place. Whereas violence is typically conceived as immediate – quick and exploding action – environmental issues must be understood as gradual and cumulative violence, whose catastrophic consequences come up only later. This shapelessness and invisibility are, according to Nixon, a challenge to different ways of representation and narration. How can one narrate the melting of ice sheets, desertification, ocean acidification, or the impacts of radioactive waste, in an understandable and effective way to influence political decision-making (2–3; see also Skiveren 2023)?

A slowly growing threat such as climate change is, according to risk psychologists, a challenge that can also explain why preventing it has proven so slow. Ecopsychologist Dodds (2021), among others, has described how it is characteristic for humans to react optimally only to quick and visible threats with obvious risks and personal impact, or which are represented by some threat or group of people conceived as an enemy. As a result, climate change in all its shapelessness and slowness has not historically caused enough pressure that would require immediate action. According to Dodds, the answer to this problem would be to promote the kind of anxiety that motivates to change one's own behaviour (223). This awakening is what nature writing and environmental literature aims at, for it often has an explicit tendency to have – by means of frightening readers – practical effects on their everyday choices.

The rise of empirical ecocriticism has followed the emergence of 'climate fiction' (or 'cli-fi') that imagines and narrativizes the dystopian consequences of slow violence. According to Goodbody and Johns-Butra (2019), climate fiction refers to a quickly growing subgenre of literature whose subject is the political, social, psychological, and ethical repercussions of human-induced climate change. Climate fiction can frame new phenomena, simulate different points of view, and therefore widen the readers' circle of concern. That is, ethical understanding and action require empathy, which in turn is based on an estimate of another's suffering, its justification, and how the other is related to one's own future expectations and goals (Goodbody and Johns-Butra 2019, 1–13; Schneider-Mayerson, Gustafson, et al. 2023, 122–123; see also Keen 2007, 18, 20–21; Meretoja 2018, 126–127). Although cli-fi has been approached as an instrument to protest climate change, empirical ecocritics have pointed out that climate fiction's real impact on audiences remains an understudied field of research (Schneider-Mayerson, Gustafson, et al. 2020, 37–38; Schneider-Mayerson, Gustafson, et al. 2023, 125–126).

Schneider-Mayerson's (2018) initial reader survey on North American readers shows that climate literature – nineteen novels from Barbara Kingsolver's *Flight Behaviour* (Kingsolver 2012) to Ian McEwan's *Solar* (McEwan 2010) – can indeed help people conceptualise the consequences of slow violence. Cli-fi concretises an abstract and ambiguous phenomenon and brings it closer to the reader. By framing familiar emotions

of sorrow, anxiety, and loss as related to climate change, it offers a more realistic understanding of the devastating effects of climate change to everyday life. Schneider-Mayerson notes that cli-fi also promotes a sense of environmental justice: it enhances consciousness of how unevenly the risks of climate change are spread and how race, class, gender, nationality, and the like interact in the process. By evoking empathy and understanding towards those who suffer, fiction can also shorten the social distance between privileged and disadvantaged groups of people. He also emphasises other emotions besides empathy, and categorises the negative feelings evoked by climate fiction, such as fear or anxiety, as positive reactions exactly because they can potentially lead to changes in behaviour. Concurrently, he acknowledges the fact that fear and anxiety, caused by reading, may also prove counterproductive to efforts at environmental engagement or persuasion (Schneider-Mayerson 2018, 477–479; Schneider-Mayerson 2020, 344, 357; see; O'Neill and Nicholson-Cole 2009).

The results of the research about the reception of cli-fi by the Finnish upper high school students support some of Schneider-Mayerson's findings. The dystopian novel *Memory of Water* helped the students to imagine climate change as a societal instead of natural phenomenon in which context it is mostly processed in Finnish schools. In other words, the depiction of society that is based on the control of the vanishing natural resource aided the students to envision how climate change might affect Nordic societies. Although the novel deliberately addresses the Finnish readers by turning the roles of privileged Nordic people and climate refugees upside down, it paradoxically paved the way for a thematic failure: many students considered both the cautionary representations of natural disasters and dictatorship in Scandinavia as implausible. The interpretations of the storyworld as highly unrealistic seemed to reduce fear and anxiety among the students (Helle et al. 2024). On one hand, this surprising result could be explained by the common conception of national exceptionalism: among Nordic welfare states, Finnish national identity is still strongly based on purity of Northern nature and stable democracy (e.g. Hennig, Jonasson, and Degerman 2018, 3–5). On the other hand, the result may challenge cli-fi on a more general level since people tend to have a more universal psychological need to envision their future brighter than other people's future (see Windschitl and O'Rourke Stuart 2016).

Furthermore, quite unexpectedly, it turned out that one Finnish class was already familiarised with the dystopia and read it in an earlier course but had not considered it in the context of the environmental crisis. Instead, they had analysed it simply as a work of fiction by discussing the roles of characters and structure of the story (Helle et al. 2024). This seems to resonate with (Schneider-Mayerson's 2020) study, in which some readers failed to approach Paolo Bacigalupi's quasi-apocalyptic *Water Knife* (Bacigalupi 2015) as climate fiction. In addition, despite their increased empathy, the novel actually strengthened many readers' fear of climate refugees (352–357; also Heise 2023, 312.). This is not, however, the first time that young adult dystopias have been found to have caused undesirable effects on attitudes. For example, political scientists Jones and Paris (2018) made an observation that Young Adult dystopias such as Suzanne Collins' *Hunger Games* (Collins 2008) make it easier for some readers to accept violence if it has desirable political motives.

The rhetoric power of action-filled dystopias is based largely on violence and on arousing fear and excitement, which is not necessarily the most effective way of

promoting environmental consciousness. For example, studies on news coverage about climate change have shown that dramatic, frightening, or shocking images catch people's attention and efficiently emphasise the importance of these issues. Be that as it may, this imagery can also cause distressing feelings of helplessness unless it offers some understanding of an individual's opportunities to make a difference. This kind of anxiety can show symptoms such as denial, apathy, blaming others, or fatalism about the impact of one's own actions eventually being only a drop in the ocean (O'Neill and Nicholson-Cole 2009; see also Schneider-Mayerson 2018, 489–490). According to Dodds (2021, 224), evoking strong fear or guilt may in fact lead to rejection instead of action, which can show as denial of not only one's own responsibility but of climate change altogether. Schneider-Mayerson (2018), while discussing similar effects, points out that this psychological tendency to avoid distressing issues may actually result in reluctance to read climate literature.

Similar conclusions on the passivating impact of fiction have been reached in audience research on Hollywood's blockbuster film *Day after Tomorrow* (2004), where climate change causes a new ice age. When the trailblazing sci-fi fantasy came out, it raised the audience's awareness of climate change, aroused fear for its consequences, and made North American viewers reflect on their voting in the upcoming presidential elections in the United States. Although the film increased viewers' motivation to take action, the audience felt that the lack of information limited individuals' possibilities to prevent climate change. The worry over the climate crisis soon gave way to everyday concerns, as is often the case when reading fiction (Leiserowitz 2004; Lowe et al. 2006; see also Schneider-Mayerson, Gustafson, et al. 2020, 37–38; Schneider-Mayerson, Gustafson, et al. 2023). For some viewers, the belief in the likelihood of events like the ones described in the film were reduced, because they had difficulties in distinguishing between science facts and science fiction (Lowe et al. 2006). The short duration of heightened motivation implies the importance of repetition in achieving the desired impact. On the other hand, frequent repetition of same images and stories can make risks not only overwhelming but also comical when graphic imagery turns into clichés.

As has been shown above, readers' emotional reactions, such as their prior knowledge on climate change, vary considerably. Accordingly, the impact of climate literature fluctuates depending on the readers' worldviews. In the same way that empathic people seem to prefer reading in general, those who are worried about climate change end up reading about it. Schneider-Mayerson (2018, 477–479; also 2020, 341–342) reminds us that climate literature appears to preach to those who already believe in human-induced climate change, and thus it does not necessarily have the power of conversion narratives. In other words, climate literature mostly strengthens cautious and concerned readers' preconceived ideas and does not make any radical impact on those who do not believe in humans' role in causing and controlling climate change (e.g. Schneider-Mayerson, Gustafson, et al. 2023, 141). This observation about the political potential of fiction, or the lack of it, reflects general consumption habits: people mostly read books and watch films whose topics they find interesting in advance.

On the value and utility of empirical ecocriticism

What, then, could the value and utility of ecocriticism be now? The methods developed during the short history of empirical ecocriticism and the results obtained with them are often inconsistent. Regardless, the research field has seen experiments that encourage further development, namely on what kind of reading experience information could be obtained by using methods from social sciences. Even though empirical ecocriticism challenges many groundless claims made in literary criticism about reading, it has been obvious from the outset that it is a tentative area of research that complements previous ecocritical studies or tests their results. So, more relevant than the results obtained so far are the follow-up questions they evoke. For example, how do the cultural and national contexts affect readers' reception of representations of non-human species and the consequences of climate change (e.g. Garrard 2023; Helle et al. 2024; Weik von Mossner et al. 2023, 179)?

The most significant and unambiguous achievement of empirical ecocriticism is that it has proven that environmental literature and cinema do not always affect their audience according to their authors' intentions. Furthermore, literary criticism often assumes that works of literature have some sort of ideal reader whose interpretation complies with a professional reader's or researcher's own analysis, but empirical studies show that different readers' experiences of the same work may vary depending on age, gender, or education, among other factors (Schneider-Mayerson 2018, 477). As a conclusion, the diversity of interpretations is not, of course, exclusive to empirical research.

In addition to personal reading histories, research has found that genres affect readers differently: romantic literature may have the strongest influence in sensitising readers' feelings towards other people, whereas science fiction, including climate dystopias, may have the weakest effect in this regard (e.g. Fong, Mullin, and Mar 2013; Schneider-Mayerson 2018, 481; compare; Kerridge 2013). Characteristically, the benefits sought from literature by readers are not always compatible with the didactic tendencies of climate literature: for example, instead of social criticism, a dystopia can serve primarily as momentary escapism or as a source of aesthetic pleasure (e.g. Felski 2008, 13–15). Accordingly, climate literature offers a challenging topic for research, as it makes use of several genres (for example, thrillers, crime fiction, or Bildungsroman) that make an impact on readers using different literary devices. If empirical ecocriticism seeks increasingly detailed information on the perceptions of literature, analysis should be targeted at different readers and these rhetorical devices that vary from one genre to the other.

While the central point of research interest is the perceptions and attitudes that fiction has evoked in readers, and potential impulses causing action, it is clear already in the light of current research that no unequivocal causality even exists. Tendencies like the attempt to raise awareness on climate change only work to an extent in fiction, and its consequences in readers can never be fully anticipated. Because literature in itself carries multiple meanings and its interpretation is contextual, analyses of the effectiveness of reading are always inevitably incomplete, case-specific, and situational, and their results are, at most, approximate.

We must also accept the premise that fiction's effects are not always measurable with existing methods, and each reader or viewer reacts slightly differently to a book they read

or a film they watch. We should emphasise that empirical ecocriticism does not attempt to create grand theories but to specifically analyse certain situationally defined cases. However, it must be said in defence of empirical studies that although their research frames and methods set certain limits on phrasing questions, they can be used to produce information on the effects of reading which cannot actually be discovered in other ways than asking readers themselves. Similarly, reader surveys are the only tool available in finding out who readers identify with in works of literature, which is a rather central question regarding the impact of literature.

The question of empirical ecocriticism's value is obviously dependent on the overall significance of literature in people's everyday life. If the objective is – at least implicitly – to have an impact on large masses, is literature an appropriate, functional tool? In most parts of the Western world, book sales and reading have decreased dramatically and literacy has weakened. Should the interest of empirical ecocriticism lay in films and video games instead of novels that many young readers find too demanding to tackle? Can any books have a more powerful or large-scale impact than movies such as *Day after Tomorrow*?

As we consider the value of empirical ecocriticism, we should also ask how we eventually mean to use the knowledge we have gained. If the most central epistemological interest in research is based on solving global environmental issues, there is a danger that literature's importance could be reduced to an ideological tool for educating readers to defend animal rights and to act against climate change. Inevitably, questions then emerge about literature's value and significance. Lately, discussion about literature has often been concerned with fiction's autobiographical approach and equivalence with reality – at the expense of imagination and, more broadly, language that is characteristic of literature. If research also adapts to this concept of literature that has already narrowed in public debate, literature's methods and possibilities to imagine different conditions and futures can easily go unnoticed.

Note

1. In the research project, *Literature and Reading in the Era of Climate Crisis*, circa 100 Finnish upper high school students in four schools wrote an essay, answered a survey, and were interviewed about their thoughts and affects after reading a novel depicting a dystopian future (Helle et al. 2024).

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