

Climate Literacy in English Language Assessments: An Ecolinguistic Analysis of IELTS and TOEFL Reading Passages

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Abstract

This study examines the degree to which climate literacy is integrated into the reading materials of two prominent English language proficiency exams: IELTS and TOEFL. Utilizing Stibbe's (2015) ecolinguistic framework, the researcher analyzes selected reading passages from the two tests, to assess the representation of environmental issues and their implications for advancing climate literacy among test-takers. The results indicate a minimal presence of climate-related content in both assessments. While the texts that do focus on environmental topics provide accurate scientific information, they typically lack a critical examination of the causes, effects, and solutions to climate change. Additionally, the depiction of climate issues is more descriptive than transformative, failing to capitalize on opportunities to enhance ecological consciousness and responsibility. IELTS features slightly more climate-related content compared to TOEFL, yet both exams inadequately incorporate narratives that foster climate literacy. The study concludes by highlighting the necessity for language assessment practices that are more attuned to ecological considerations and align with global sustainability objectives.

Keywords: climate literacy, English language proficiency, IELTS, TOEFL, Ecolinguistics, Reading Passages, language assessment.

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محو الأمية المناخية في اختبارات اللغة الإنجليزية: دراسة لسانية بيئية للمقاطع القرائية في امتحاني الآيلتس والتوفيل

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المستخلص

تبحث هذه الدراسة في مدى دمج الثقافة المناخية في المواد القرائية لاختبارين بارزين في إجادة اللغة الإنجليزية: الآيلتس والتوفيل. باستخدام الإطار البيئي اللغوي لستيبي (Stibbe, 2015)، يحلل الباحث نصوصاً قرائيةً مختارة، لتقييم تمثيل القضايا البيئية وآثارها على تعزيز الثقافة المناخية بين المتقدمين للاختبار. تشير النتائج إلى وجود ضئيل للمحتوى المتعلق بالمناخ في كلا الاختبارين. بينما توفر النصوص التي تركز على الموضوعات البيئية معلومات علمية دقيقة، فإنها عادة ما تفتقر إلى الفحص النقدي لأسباب وآثار وحلول تغير المناخ. بالإضافة إلى ذلك، فإن تصوير القضايا المناخية أكثر وصفية من كونها تحويلية، مما يفشل في الاستفادة من الفرص لتعزيز الوعي والمسؤولية البيئية. أظهرت النتائج بأن اختبار الآيلتس يتضمن محتوى مناخياً أكثر قليلاً مقارنة بالتوفيل، إلا أن كلا الاختبارين لا يدمجان بشكل كافٍ السرديات التي تعزز الثقافة المناخية. تختتم الدراسة بتسليط الضوء على ضرورة ممارسات اختبارات اللغة التي تكون أكثر انسجاماً مع الاعتبارات البيئية وتتماشى مع أهداف الاستدامة العالمية.

كلمات مفتاحية: محو الأمية المناخية، إجادة اللغة الإنجليزية، IELTS، TOEFL، اللسانيات البيئية، النصوص القرائية، تقييم اللغة.

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1. Introduction

Climate literacy, defined as the understanding of climate science, its impacts, and the ability to make informed decisions regarding climate-related issues, has become a critical area of focus in education worldwide. As global challenges such as climate change intensify, there is an increasing need for individuals across all disciplines to possess foundational knowledge about environmental sustainability (UNESCO, 2021). This necessity extends beyond scientific fields into broader domains such as language education, where assessments like the International English Language Testing System (IELTS) and Test of English as a Foreign Language (TOEFL) play a pivotal role in shaping academic and professional opportunities for millions of test-takers globally.

Language proficiency tests such as IELTS and TOEFL are designed to evaluate candidates' abilities to comprehend and analyze complex texts on diverse topics (Weir, 2005). These assessments often include reading passages that reflect real-world issues, including those related to science, technology, history, and culture (McNamara, 2000). However, the extent to which these tests incorporate climate literacy—an essential component of contemporary global discourse remains underexplored. Given the urgency of addressing climate change through education at all levels, it is vital to examine whether these high-stakes language assessments adequately integrate content that fosters awareness and understanding of climate-related issues (UNESCO, 2020).

The inclusion of climate literacy in standardized language tests serves multiple purposes. First, it aligns with global educational goals aimed at promoting sustainable development by embedding environmental themes into curricula and assessments (UNEP, 2022). Second, it provides test-takers with exposure to critical vocabulary and concepts related to climate science while assessing their ability to engage with complex informational texts. Lastly, it reflects the evolving priorities of modern societies where environmental awareness is increasingly regarded as a core competency for academic success and civic engagement.

This study investigates how IELTS and TOEFL reading passages address climate literacy by conducting an ecolinguistic analysis of their content. Specifically, it examines whether these assessments include passages that discuss key aspects of climate change such as its causes, consequences, mitigation strategies, or policy implications and evaluates how effectively they present this information within the context of language proficiency testing. By analyzing the representation of climate-related topics in these widely recognized exams, this research aims to shed light on their potential role in fostering environmental awareness among test-takers.

This study aims to fill the gap by examining Climate Literacy in English Language Proficiency Assessments, specifically through the analysis of IELTS and TOEFL reading passages using Stibbe's 2015 framework. In summary, the study aims to provide valuable insights into the intersection between language assessment practices and global sustainability goals.

1.2 Research Problem

Although there is a growing need to tackle climate change through education, there is a lack of insight into how high-stakes English language proficiency exams such as IELTS and TOEFL help foster climate literacy among test-takers. While these assessments significantly influence educational curricula globally, their potential as instruments for enhancing awareness of environmental concerns has yet to be fully investigated. Additionally, initial findings indicate that although some reading passages may address environmental themes, they often do so superficially and do not engage deeply with intricate issues such as sustainability or climate justice.

With their global influence, IELTS and TOEFL have a unique chance to raise awareness among millions about critical issues like climate change; however, it remains uncertain if they effectively capitalize on this opportunity. Current research on testing content generally centers on aspects like linguistic complexity or cultural fairness, rather than focusing on thematic evaluation through frameworks

such as Stibbe's ecolinguistics. This creates a gap in our understanding of how these assessments convey ecological narratives. By tackling this research issue, the study seeks to offer practical insights that could guide future enhancements of test content and contribute to ongoing discussions about incorporating sustainability into educational systems worldwide.

1.3 Objectives of the Study

The research aims to:

- 1) Examine the extent and depth of climate literacy components in reading passages of IELTS and TOEFL through Stibbe's ecolinguistic framework.
- 2) Assess how the portrayal of environmental issues in these tests corresponds to enhancing awareness and comprehension of global climate challenges.

1.4 Research Questions

The study investigates:

- 1) What is the extent of climate literacy content embedded in IELTS and TOEFL reading passages, as analyzed through Stibbe's model of ecolinguistics?
- 2) How do IELTS and TOEFL reading passages represent environmental issues, and what implications do these representations have for fostering climate literacy among test-takers?

1.5 Research Hypotheses

- 1) IELTS and TOEFL reading passages contain limited explicit content on climate literacy, reflecting a gap in addressing environmental education within English language proficiency assessments.
- 2) The representation of environmental issues in IELTS and TOEFL reading passages is predominantly descriptive rather than critical, limiting their potential to enhance test-takers' engagement with climate-related topics.

1.6 Significance of the Study

The study holds significant value for multiple stakeholders, including educators, policymakers, test developers, and learners. Climate change is one of the most pressing global challenges today. By analyzing how climate-related topics are represented in widely used English language

proficiency tests like IELTS and TOEFL, this study highlights whether these assessments contribute to fostering climate literacy among test-takers. The findings could encourage test developers to incorporate more meaningful and critical content on environmental issues, thereby aligning language education with global sustainability goals.

Subsequently, IELTS and TOEFL are taken by millions of individuals worldwide who aim to study or work in international context (<https://takeielts.britishcouncil.org>). Including climate literacy elements in these tests can help prepare individuals to become informed global citizens capable of addressing environmental challenges. This aligns with the United Nations' Sustainable Development Goal (SDG) 4.7, which emphasizes education for sustainable development and global citizenship.

The study provides insights into the thematic diversity of reading passages in IELTS and TOEFL. If gaps are identified in representing climate-related issues, it could prompt revisions to ensure that test content reflects contemporary global concerns. This would enhance the educational value of these assessments beyond mere language proficiency testing.

By applying Stibbe's ecolinguistic framework, the study contributes to the growing field of ecolinguistics by examining how language shapes perceptions of environmental issues. It also bridges the gap between ecolinguistics and applied linguistics by exploring practical applications in high-stakes testing contexts.

2. Theoretical Framework

2.1 Definition and Components of Climate Literacy

The concept of literacy has expanded beyond its traditional definition of reading and writing proficiency (Kasper 2000). According to UNESCO (2006), literacy now encompasses the capacity to "identify, understand, interpret, create, communicate, and compute, using printed and written materials associated with varying contexts". This broader definition portrays literacy as an ongoing learning process that equips individuals with the necessary skills to fully engage in society and make

meaningful contributions to economic and cultural spheres. In contemporary settings, literacy has grown to include various dimensions such as digital, media, and climate literacy, reflecting the diverse requirements of modern life (Street,2003). Academics like Freire (1985) emphasizes the transformative and critical aspects of literacy, arguing that it extends beyond technical skill acquisition to empower individuals in analyzing, questioning, and transforming their world. Consequently, literacy in today's context represents a fluid and situational set of abilities that influence how individuals interact with their surroundings and the global community at large.

However, climate literacy involves grasping the functioning of the climate system, the ways human activities affect it, and its impact on people and the Earth's ecosystems (U.S. Global Change Research Program, 2024). It encompasses knowledge of the social, economic, ethical, environmental, cultural, and civic aspects of climate change and the various strategies to tackle it at individual, community, national, and global scales (Gibson, 2021; Oziewicz, 2023; Cantell et al., 2019; Monroe et al., 2017; UNESCO, 2024). Additionally, it provides avenues for individuals and communities to adopt new habits and take action at the personal, familial, educational, or community level (UNESCO, 2024).Being climate literate is essential, though not solely sufficient, for empowering individuals and communities to initiate actions that lead to meaningful and equitable results in mitigating and adapting to climate change, benefiting individuals, societies, non-human species, and the global environment (Hollweg et al., 2011; Boon-Falleur et al., 2022).

Furthermore, students should understand the geographic and socio-economic disparities in climate vulnerability, acknowledging that different populations experience varied effects (Johnston, 2018).An essential aspect of climate literacy that could be assessed is the ability to analyze and interpret climate data. This includes the skills to handle various data types, examine relationships between different variables, and utilize data visualizations to explain complex issues. Students need to evaluate the quality of data, differentiate between correlation and causation, and draw conclusions based on evidence, this competency could be evaluated within the science framework by asking students to analyze datasets related to global temperatures, carbon emissions, or

biodiversity decline (Powers et al., 2021). Such tasks would require them to identify data patterns and make predictions based on observable trends. Interactive activities could allow students to build, calibrate, and assess the reliability of basic climate models, fostering critical thinking about the scientific method and evaluating their ability to tackle complexity through systems thinking.

Additionally, assessing students' critical analysis skills with regard to climate change-related information and media content is important. This involves evaluating the reliability of media sources, acknowledging cultural perspectives, and integrating information from various sources Vincent (Lancrin, S. et al. 2019). For example, in reading assessments, students could analyze news articles or opinion pieces on climate change, focusing on how cultural or political biases influence coverage. They would assess source reliability, evaluate claims, and synthesize information from diverse perspectives. Such critical reading tasks help students recognize how biases affect public discussions and encourage them to consider multiple viewpoints on climate issues.

Furthermore, in the area of AI and media literacy, students could be tasked with identifying credible, science-based information or potential misinformation in social media posts or news articles about climate change. They would evaluate the credibility of different sources, fact-check statements, engage in discussions with peers, and integrate various viewpoints into a well-rounded, evidence-based conclusion. These fact-checking exercises promote the assessment of digital media reliability and increase understanding of misinformation's impact on public perceptions of climate action (Sarkar & Ghosh 2024).

2.2 Importance of Climate Literacy in the 21st Century

In the 21st century, climate literacy has emerged as an essential skill for individuals and communities globally. As the effects of climate change become increasingly apparent from extreme weather events to rising sea levels the need for informed citizens capable of understanding and engaging with complex climate issues is paramount (Miller, 2013). Climate literacy not only empowers individuals with the knowledge to make informed decisions but also equips them with the tools to advocate for sustainable practices that can mitigate the effects of climate change.

At its core, climate literacy involves comprehending the fundamental principles of climate science, including the greenhouse effect, carbon cycles, and the impact of human activities on climate systems. According to the National Oceanic and Atmospheric Administration (NOAA), climate literacy is defined as the understanding of one's influence on climate and climate's influence on society (NOAA, 2021). This foundational knowledge is crucial, as it allows individuals to recognize the severity of climate issues and their direct implications for health, economy, and natural ecosystems (Leiserowitz et al., 2017).

Moreover, Education plays a pivotal role in advancing climate literacy. Effective climate education initiatives can foster a proactive mindset among students and community members (Nusche, Fuster Rabella and Lauterbach, 2024). For instance, integrating climate science into school curricula has shown promising results in increasing awareness and understanding. This educational approach encourages learners to not only absorb information but actively participate in solutions, reinforcing the notion that informed citizens can contribute positively to climate action. By empowering students to think critically and creatively about climate change, educators can instill a sense of responsibility and agency in them, motivating them to take action in their communities and beyond (Nusche et al., 2024).

Furthermore, climate education can help individuals develop the skills and knowledge needed to make informed decisions about their impact on the environment (Ardoin, Bowers and Wheaton, 2022). By teaching students about the causes and consequences of climate change, educators can empower them to make sustainable choices in their daily lives and advocate for policies that promote environmental conservation. By equipping individuals with the tools to understand and address climate change, education can play a crucial role in building a more sustainable and resilient society (Hayes, Barocas and Levy, n.d.; Pihkala, 2020).

Climate literacy also enhances civic engagement. Individuals who understand the science behind climate change are more likely to support policies aimed at reducing carbon emissions and promoting renewable energy (Fletcher et al., 2019). This connection between literacy and

activism is significant; when citizens are informed, they can hold governments and corporations accountable for their environmental policies and practices. The 2021 United Nations Climate Change Conference (COP26) highlighted the importance of public engagement in climate discussions, stressing that informed citizens are essential to driving meaningful action (UNFCCC, 2021). Climate literacy plays a crucial role in fostering civic engagement, as individuals who understand the scientific principles behind climate change are more likely to participate in environmental activism, advocate for policy changes, and adopt sustainable practices. Research indicates that climate-literate individuals are more inclined to support policies aimed at reducing carbon emissions, promoting renewable energy, and protecting ecosystems (Lee et al., 2020). This connection between knowledge and action is particularly evident in democratic societies, where public awareness can influence political decisions and corporate behaviors.

2.3 Language Proficiency Assessments

Language proficiency is generally defined as the capability to effectively and accurately employ language skills and to understand its nuances and roles. It is characterized by the language functions needed in particular situations (Hawkins, 2004). Achieving language proficiency involves building a rich linguistic repertoire that enables students to engage in discussions about diverse cultural and contextual scenarios. In reality, learners must adapt their language usage based on intention and context, utilizing different strategies and genres. Language proficiency is defined by Sterns (1983: 341) as: “the actual performance of given individual learners or groups of learners”.

Measuring language proficiency is a complex process that requires the use of valid and reliable language testing tools. Language assessments take various forms depending on the skill or proficiency level being tested. There are different types of Language Proficiency Assessments, two of which are IELTS and TOEFL (Peltekov, 2021).

2.4 Ecolinguistics

Ecolinguistics is an interdisciplinary field that merges aspects of the natural sciences with the humanities (Bang, 1987). It serves as a framework for examining language in relation to ecology, allowing us to

comprehend how our current ecological realities are formed and how we might change them. The new discipline of ecolinguistics is most commonly linked to Norwegian American linguist Einar Haugen, who, around 50 years ago, introduced the ecology metaphor to language. He characterized the ecology of language as “the study of the interactions between any given language and its environment” (Haugen ,1972: 325). For Haugen, the language's environment encompasses the society that utilizes it, including its social and psychological aspects, but excluding physical surroundings. Nonetheless, he likened the ecology of language to the relationships between animals and plants within their environments (Haugen ,1972).

In a 1911 lecture to the American Anthropological Association, Edward Sapir (2001 [1912]) explored how the physical environment such as geographic features and climate and social factors like religion and political organization affect language. He noted that the physical environment influences language only when socially significant. Trim (1959) referred to the examination of variation within speech communities and its functions as linguistic ecology. American linguists Carl F. Voegelin, Florence M. Voegelin, and Noel W. Schutz Jr. applied the ecology concept to the linguistic varieties found in Arizona (e.g., Voegelin and Voegelin 1964; Voegelin et al. 1967). The term ecolinguistics was first used by French sociolinguist Jean Baptiste Marcellesi in 1975, and four years later, Salzinger (1979) highlighted the necessity of considering the context in which language is utilized, incorporating psycho-, neuro-, and sociolinguistics into his definition (see Couto 2014). In 1985, French linguist Claude Hagège adopted the term ‘écolinguistique’ and suggested it should focus on the relationships between the physical world and language ecologies (Hagège 1985).

The second aspect of language ecology emerged from Halliday's keynote address at the 9th Congress of the AILA (International Association of Applied Linguistics) in Thessaloniki, Greece, in 1990 (see Fill 1998). He underscored language's role in addressing environmental issues, whether exacerbating or resolving them, by linking language to ideologies such as growthism, speciesism, and classism. Halliday asserted that environmental concerns should be central to applied linguistics, which laid the groundwork for the field of

Ecological Discourse Analysis (EDA), bringing a biological perspective to the study of language.

2.6 Climate Change Themes

Climate change has emerged as a central theme in global environmental discussions, but only a limited number of ecolinguists have addressed this topic. These scholars have focused on analyzing media portrayals, specifically examining metaphors and framing, as well as narratives and stories (Stibbe 2015).

According to Stibbe, our lives are shaped by narratives that normalize social constructs; we navigate our existence through stories that include socially accepted symbols and influence our interactions with others, living beings, and the environment. Forte (2020) comments on Stibbe's perspective by suggesting that the ecological harm present in these narratives serves as a criterion for their classification. Narratives that promote or permit harm to living things and nature are considered destructive, while those that encourage protective attitudes and actions are viewed as beneficial. These positive narratives offer new alternatives to harmful ones by emphasizing nature in its authentic form rather than as a resource to be exploited. Stibbe asserts that ecolinguistics can explore the dominant linguistic patterns that shape how people perceive and engage with the world around them. It delves into what Stibbe refers to as the "stories we live by," which are the mental frameworks that influence our behavior and are fundamental to the environmental issues we face today. As outlined in Table 2, the framework combines ecolinguistics with Critical Discourse Analysis (CDA), facilitating an examination of the communication between humans and the natural world. While CDA focuses on analyzing the concealed, obscure, and overt structures of dominance, discrimination, power, and control as reflected in language (Wodak & Meyer 2015), ecolinguistics uncovers hidden narratives and questions whether these narratives inspire people to protect or damage the ecosystems essential for life.

Table 1: Ecolinguistic framework by Stibbe (2015)

Story Type	What it is	What to look for
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Ideology	How the world was, is and should be, in the minds of members of a group	characteristic language features used by members of a group
Framing	The use of a source frame to structure a target domain	Trigger words that bring a particular source frame to mind
Metaphor	A framing where the source frame is from an imaginable area of life	Trigger words that bring a particular source frame to mind
Evaluation	A story in people's minds about whether an area of life is good or bad	Appraisal patterns which represent things positively or negatively
Identity	What it means to be a particular kind of person	Forms of language that characterize people
Conviction	Whether a particular description is true, certain, uncertain or false	Facticity patterns that represent a description as true, uncertain or false
Erasure	That something is unimportant or unworthy of consideration	Patterns of language which erase or diminish
Saliency	That something is important or worthy of consideration	Patterns of language which foreground an area of life

2.7 Review of the Related Studies

In the first place, in 2018, Li, Y. undertook research to explore the difference between IELTS and TOEFL iBT reading tests. This article creates a comparison framework by combining Bachman's test method facets with Alderson's reading nature variables to analyze the reading components of two tests. The findings indicate that the tests share several similarities in their rubrics and input formats, but they differ somewhat in scoring methods and the specifics of procedures and tasks. Nonetheless, notable differences are observed in areas such as language use and task characteristics, which significantly affect test taker performance. The TOEFL iBT reading test is found to be more challenging due to its readability, text types, topic features, and question types, while the IELTS presents greater complexity with its text length and grammatical intricacy.

Likewise, a study was conducted by Carlie D. Trott (2019) discussed the role of informal learning settings in enhancing children's intergenerational and political engagement in climate change. The researcher utilized mixed-method study to explore how children aged ten to twelve processed their increasing awareness of climate change through an after-school program that employed participatory techniques to encourage informed action. Over fifteen weeks, the program integrated hands-on learning with digital photography and concluded with youth-led projects that addressed personal (i.e., daily habits) and collective (i.e., community initiatives) changes. By the end of the program, participants had a significantly greater understanding of both the scientific and social aspects of climate change compared to their knowledge prior, and also in relation to the average U.S. teen or adult. Analysis of surveys and focus groups revealed that, in addition to gaining knowledge, the children felt motivated and inspired by their growing awareness of climate issues. They reported feeling empowered by what they had learned and expressed a desire to further their understanding and take action to reduce negative impacts.

In a similar vein, Toroghi R., et al (2021) conducted a study aimed to investigate how well different items in the reading comprehension section of the IELTS exam discriminate among test-takers, using event

related potentials (ERP) as a measurement tool. The study employed a mixed methods design. In qualitative phase the researchers utilized PSYTASK software to present stimuli and WINEEG software to record the brain waves of each participant. By employing WINEEG, they obtained ERP graphs from these brain waves. Subsequently, the researchers converted the qualitative data (ERP graphs) into quantitative data (numerical values). MATLAB software was then used for data analysis and interpretation. Involving 10 participants with band scores ranging from 6 to 8 utilized reading comprehension items from a discontinued IELTS version as a task for the test takers. The findings revealed a discrepancy between the difficulty levels assigned to the reading comprehension item types and the evidence gathered from ERP.

In a contemporary study carried out in (2024), Olaleye offered a critical analysis of the ideologies present in the design, scoring, and interpretation of IELTS and TOEFL tests, highlighting the biases that arise from favoring native speaker norms. The study called for a significant transformation towards more inclusive and equitable assessment methods to bridge the gap between standardized testing and the complexities of Global Englishes (GE). Additionally, the study emphasized the importance of recognizing the changing nature and variety of the English language in today's global context, arguing that proficiency should be evaluated based on the diverse ways language is used rather than a single, rigid standard. The study concludes that acknowledging the validity of GE in assessment practices can have significant implications for individuals, institutions, and societies, as it can improve access to quality education, immigration opportunities, and professional advancement. Ultimately, it advocates for breaking down linguistic barriers and appreciating the diverse landscape of GE.

While earlier research has looked into the linguistic complexity and formats of standardized tests, there has been limited focus on the thematic content and its relevance to current global issues. Most recent studies have concentrated on the validity and reliability of these tests, but the incorporation of important subjects like climate change and sustainable development into test materials has not been adequately examined. Despite the growing prominence of climate change

discussions in academic and professional settings, there has been a lack of systematic analysis regarding the representation of environmental themes in IELTS and TOEFL reading passages. This oversight is crucial, as test-takers globally are anticipated to engage with these issues in their educational and professional paths. Consequently, a thorough content analysis exploring how climate change and sustainable development themes are portrayed in IELTS and TOEFL exams would fill this important research gap and offer valuable insights for test developers, educators, and policymakers.

3. Methodology

3.1 Introduction

The theoretical side presented in first two sections shows that climate literacy is a crucial 21st century skill, intertwined with environmental education and other disciplines, and is assessed within language proficiency frameworks. Consequently, this section presents the research methodology and the steps taken during this study. It offers a comprehensive overview of the research design and data sources. Additionally, it will elaborate on the instruments used and explain the rationale behind the study.

3.2 Research Design and Epistemology

This qualitative study is based on a critical-ecological epistemology and follows Stibbe's (2015) ecolinguistic framework. It argues that language plays a crucial role in shaping perceptions and reinforcing certain ideologies, rather than serving as a neutral tool. Within this context, English proficiency tests like IELTS and TOEFL are seen as cultural artifacts that carry implicit societal and environmental messages, rather than merely assessment tools. Drawing from Stibbe's concept of "stories we live by," the research illustrates how the narratives in reading passages can either support or obstruct climate literacy, thereby influencing learners' ecological awareness. Employing a qualitative interpretivist methodology, the study seeks to uncover deeper meanings and values in assessment materials through thorough analysis (Cresswell, J.W., & Cresswell, J.D. 2018). Furthermore, it takes a critical qualitative stance by exploring the ideological dimensions of these texts—

specifically their connections to, omissions of, or challenges to environmental sustainability principles. In doing so, this research adds to the growing field of ecolinguistic studies, aimed at promoting a more environmentally aware use of language in educational contexts through in-depth qualitative analysis.

3.3 Data Collection

The primary data for this study comprises reading passages from two widely recognized English language proficiency tests: the International English Language Testing System (IELTS) and the Test of English as a Foreign Language (TOEFL). A purposive sampling method was employed to select a representative corpus of reading passages that explicitly or implicitly address climate-related topics. These passages were collected from recent official IELTS and TOEFL preparation materials and test samples published within the last ten years to ensure relevance and currency.

3.4 Data Sampling

This study utilized a purposive sampling technique to select textual resources. The textual data comprised reading passages sourced from well-known, standardized English language proficiency tests. Specifically, these passages were taken from **the IELTS Academic Cambridge editions 13 (2017), 16 (2021), and 18 (2023), along with Barron's IELTS Practice Exams (2016)**. Additionally, materials were collected from **the ETS TOEFL iBT (2015 edition) and the ETS TOEFL Go Learn! platform (2023)**. These sources were chosen for their extensive use in international English assessments and their representation of genuine academic reading materials.

3.5 Methods of Qualitative Analysis

The study's qualitative component entails a textual examination of chosen readings from the TOEFL and IELTS, two globally recognized assessments of English language competency. The following are the steps taken during this phase:

1. Data Collection: A variety of publicly accessible IELTS and TOEFL practice materials are used to gather reading passages. To guarantee a thorough representation, both academic and general training modules are included in the selection.

2. Data Selection: The selection of pertinent texts is predicated on their thematic pertinence to topics pertaining to the environment and climate. Priority is given to passages that discuss ecological issues, either directly or indirectly.

3. Analysis of Texts: Applying an Ecolinguistic Framework: Stibbe's (2015) framework of *Stories We Live By* is used to study the chosen texts from an ecolinguistic perspective. This entails recognizing the discourses, ideologies, and language patterns that influence how the environment is portrayed. Finding hidden messages that either reinforce or contradict ecological sustainability is the main goal of the investigation.

4. Data Analysis, Interpretation, and Discussion

4.1 Introduction

This section focuses on the analysis and interpretation of the collected data. The data is collected from the reading excerpts sourced from IELTS and TOEFL tests. The section includes a detailed analysis of the reading passages using Stibbe's (2015) ecolinguistic framework from "*Ecolinguistics: Language, Ecology and the Stories We Live By*". The framework explores how language shapes ecological relationships through various discourses and narrative structures. By applying this approach, the study aims to examine the extent and depth of climate literacy components in reading passages of IELTS and TOEFL through Stibbe's ecolinguistic framework. It also aims to assess how the portrayal of environmental issues in these tests corresponds to enhancing awareness and comprehension of global climate challenges. In this chapter, the results are presented, analyzed, interpreted, and discussed in the context of existing literature. The analysis of the data, the findings, and their interpretation are aligned with the research objectives. Furthermore, data collection occurs simultaneously, utilizing a convergent parallel design as a mixed-methods approach.

4.2 Qualitative Analysis of Data

4.2.1 Analysis of Passage 1: SAVING THE SOIL

The text "Saving the Soil," featured in an IELTS style reading assessment, discusses the global issue of soil degradation. It highlights soil's vital functions in climate stability, biodiversity, and food security, serving as a rich basis for exploring how environmental concerns are expressed through language. This analysis utilizes Stibbe's (2015) ecolinguistic framework to examine the ecological narratives, ideologies, and linguistic strategies present in the text and their implications for climate awareness.

4.2.1.1 Ideology

Stibbe defines ideology as a system of ideas that shapes what is considered "normal." This passage challenges the dominant growth oriented, technocratic ideology of agriculture by: critiquing the use of chemical fertilisers, highlighting the failure of industrial practices to return nutrients to the soil, and advocating for ecological limits ("zero net land degradation"). However, the text also implicitly supports a scientific managerial ideology, where technological solutions (e.g., soil databases, microbial cocktails) are central, leaving economic reform or systemic change relatively untouched.

4.2.1.2. Framing

Stibbe points out that framing influences which aspects of reality are emphasized or downplayed. In this text, soil is depicted not merely as a lifeless material but as a vibrant ecosystem that hosts "microorganisms such as viruses and fungi," playing a crucial role in climate regulation and biodiversity. For example, it states, "A single gram of healthy soil might contain 100 million bacteria..." This perspective fosters a relational ecological worldview, opposing the prevailing extractivist viewpoint often seen in agricultural discussions, which treats soil solely as a resource to be exploited.

4.2.1.3. Metaphor

Metaphors in the passage serve to shape ecological perception. For example: Soil is metaphorically depicted as a “system” or “ally” in the fight against climate change. Degraded soil is framed like an ill patient needing protection or healing (e.g., “soils on the brink”). Such metaphors evoke empathy and urgency, reinforcing soil’s vital role in planetary health.

4.2.1.4. Evaluation

The text assesses actions and entities positively and negatively: Positive assessments highlight the work of researchers advocating for “protected zones for endangered soils” and scientists creating “a cocktail of beneficial bacteria.” Conversely, negative evaluations criticize the “indiscriminate use of fertilizers” and the decline of traditional farming methods. Such evaluative language steers readers toward ethically responsible ecological viewpoints, which is a crucial element of eco-literate literature.

4.2.1.5. Identity

The text depicts ecological identities for both humans and soil: Soil is ascribed agency and importance: “Soils also store water, preventing flood damage...” Humans are categorized into responsible agents (such as scientists and Pius Floris) and those contributing to degradation (like farmers using artificial fertilizers). This distinction prompts a thoughtful ecological identity, encouraging readers to reflect on their own impacts within environmental systems.

4.2.1.6. Conviction

Conviction refers to how strongly a text commits to its claims. This passage expresses strong conviction, seen in use of modal verbs: “must be taken,” “could be gone,” “we need to take action now.” in addition to alarming figures: “60 years,” “£233 million every year.” Repetition of irreversible consequences: “may take thousands of years to recover.” This assertive tone promotes reader responsibility, a powerful strategy for embedding ecological urgency into educational discourse.

4.2.1.7. Salience and Erasure

Stibbe explains that salience highlights what is brought to attention, while erasure involves what is omitted. Highlighted aspects: Soil biodiversity, the climate regulating roles of microorganisms, and practices for sustainable soil management. Omitted or downplayed aspects: The influence of corporate agribusiness, economic pressures, and political interests that uphold unsustainable farming. Although the passage critiques commercial practices, it does not directly identify systemic or institutional players. This selective focus could be addressed in testing frameworks to promote a deeper ecological awareness.

Table 2: Summary of Discursive Features Based on Stibbe's Framework passage 1

Tool	Analysis
Ideology	Challenging industrial agriculture; supports scientific solutions
Framing	Soil as a living, biodiverse system
Metaphor	Soil as ally, patient, and system
Evaluation	Fertilisers use = bad , soil science= good
Identity	Soil as an agent ; humans as both destroyers and stewards
Conviction	Urgent, authoritative tone promotes action
Erasure	Erases corporate/ political systems
Salience	Highlighting ecology

4.2.2 Analysis of Passage 2: Photosynthesis in Extreme Environments

The text "Photosynthesis in Extreme Environments" featured in an TOEFL style reading assessment, examines the extraordinary adaptability of organisms in harsh environments from an ecological

standpoint, showcasing specialized forms of photosynthesis. It discusses how desert plants employ CAM photosynthesis to save water, how polar species harness minimal light beneath ice, and how deep-sea bacteria depend on chemosynthesis at hydrothermal vents. These adaptations highlight the resilience and variety of life in areas once deemed inhospitable. The text portrays these ecosystems as vibrant and life-sustaining instead of desolate, emphasizing the creativity of nature while overlooking the influence of human activities, including climate change. Overall, it celebrates the durability of ecological processes but could enhance its message by connecting these adaptations to a sense of environmental responsibility.

4.2.2.1 Ideology

Ideology is the foundational beliefs expressed or reinforced by the text. However, the text predominantly conveys an ecocentric and scientific ideology, presenting a perspective in which life is resilient and adaptable when faced with environmental hardships. By focusing on the survival and adaptability of photosynthetic organisms in harsh conditions, it fosters an understanding of biological resilience and a respect for ecological diversity. This approach subtly encourages a recognition of non-human life forms and their essential roles in sustaining ecosystems, thus challenging human-centered views that prioritize human interests over environmental health.

4.2.2.2 Framing

Framings here means the presentation or "framing" of issues to shape perception. The text portrays extreme environments not as desolate or void of life, but as challenging yet occupied spaces where life persists. Locations like deserts, polar regions, and deep oceans are depicted as tough yet ecologically important, promoting a perspective that reframes them from "inhospitable" to deserving of scientific inquiry and ecological value. This framing supports a narrative of ecological interconnectedness and adaptability.

4.2.2.3 Metaphor

Metaphor means the use of metaphorical language that influences understanding. The text employs a few subtle metaphors. The term “foundation of most ecosystems” symbolically indicates that photosynthesis serves as a crucial structural element for life. Additionally, the phrase “the ability to carry out photosynthesis... highlights the adaptability and resilience of life” gives life a sense of agency and capability. These metaphors contribute to an eco-centric narrative that underscores life's perseverance amid adversity.

4.2.2.4 Evaluation

Expressions of value or judgment highlighting what is seen as positive or negative. Positive assessments prevail in the text, with phrases like “remarkable adaptations,” “specialized pigments,” “resilience of life,” “thrive,” and “diverse communities.” These terms celebrate biological diversity, adaptation, and survival, portraying organisms and their behaviors favorably. Notably, there is an absence of negative evaluations regarding human actions or the natural world, indicating a joyful recognition of nature's potential.

4.2.2.5 Identity

The construction of identities for people, animals, plants, or systems. The text grants agency and identity to non-human organisms, referring to plants that “have developed strategies,” bacteria that “use hydrogen sulfide,” and algae that “have evolved the ability.” This representation positions non-human life as active participants in their survival, challenging the anthropocentric notion that only humans possess intent or intelligence. It fosters an identity for ecological beings that acknowledges their significance and capabilities.

4.2.2.6 Conviction

Established discourse about the environment reflecting societal norms. The text adheres to the stylistic norms of scientific writing by being objective, informative, and devoid of emotional language. It utilizes biological and ecological terminology (e.g., “CAM photosynthesis,” “chemosynthetic bacteria”) and relies on categorical classifications (deserts, polar regions, deep oceans) typical of environmental science literature. While this enhances credibility, it may

also hinder emotional connection, potentially diminishing its effectiveness in raising environmental awareness.

4.2.2.7 Erasure

The omission of significant elements that might alter understanding. The text completely omits references to human activity. Issues like climate change, pollution, and the anthropogenic impact on extreme environments are not mentioned. Furthermore, it lacks any cultural or indigenous insights related to these environments. This erasure may depoliticize the discussion and overlook opportunities to connect biological adaptation with human accountability or co-existence, fostering a detached scientific viewpoint that neglects the wider socio-environmental context.

4.2.7.8 Saliency

What is emphasized or downplayed in the text. **Emphasized:** Biological adaptation, survival strategies, and specific ecosystems (deserts, polar, deep sea). The ability of organisms to perform photosynthesis despite environmental challenges is highlighted. **Downplayed:** Climate change, environmental degradation, and human influences. Additionally, broader ecological systems beyond photosynthesis are less emphasized. By prioritizing natural resilience, the text highlights life in extreme environments but overlooks the opportunity to link these adaptations to urgent ecological concerns.

Table 3: Summary of Discursive Features Based on Stibbe's Framework passage2

Tool	Analysis
Ideology	Promotes nature's value, omits climate justice
Framing	Frames adaptation well, hinders climate threat
Metaphor	Biological resilience without environmental urgency
Evaluation	Lacks ethical/ moral stance
Identity	Nature as agentive, no human role

Conviction	Solid scientific claims, no climate critique
Erasure	No mention of human role or climate crisis
Salience	Omit major climate and human context

5. Findings and Conclusion

Climate change has become an urgent topic of focus in recent years. Language assessments frequently include reading passages that address climate change to evaluate students' understanding and analytical abilities. These passages often cover diverse subjects related to climate change, including its causes, impacts, and possible solutions.

One prevalent linguistic characteristic in these reading materials is the incorporation of scientific vocabulary. Terms such as "greenhouse gases," "global warming," and "carbon footprint" are commonly found, offering readers a deeper insight into the intricate scientific concepts surrounding climate change. This inclusion not only enhances understanding but also aids students in expanding their vocabulary within the realm of environmental science.

Another significant feature found in climate change reading passages is the presence of statistical data and evidence. These texts frequently reference findings from scientific research, reports, and surveys to substantiate claims about climate change's effects on the environment. By presenting statistical information, these passages prompt students to engage in critical analysis and interpretation, strengthening their ability to evaluate data within a scientific framework.

Moreover, these reading passages often depict environmental phenomena and occurrences through vivid imagery and sensory language to illustrate the severe consequences of climate change, such as melting ice caps, rising sea levels, and extreme weather events. The use of descriptive language aims to evoke an emotional response and emphasize the need for urgent action against climate change. This aspect helps students improve their comprehension and interpretation of descriptive language in environmental contexts.

In summary, language test reading passages concerning climate change incorporate various linguistic elements that aim to inform students about this complex global challenge. By examining scientific terminology, statistical evidence, and descriptive language in these texts, students can enhance their comprehension and analytical abilities related to climate change. Ultimately, these reading passages offer meaningful opportunities for students to engage with crucial environmental issues while developing their language skills.

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