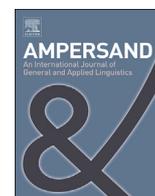


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Language and ecology: A content analysis of ecolinguistics as an emerging research field



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HIGHLIGHTS

- This study is the first quantitative meta-analysis of ecolinguistics from the perspective of journal publications.
- A total of 76 journal publications on ecolinguistics between 1991 and 2015 were analyzed.
- The results indicate a promising growth of ecolinguistics as an emerging subfield of language and communication studies.
- The results also suggest current limitations and future research agenda of ecolinguistics.

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1. Introduction

This research note serves as a response to [20] recent call for a coherent definition of “ecolinguistics” and a systemic review of this evolving field. Specifically, the aim of this paper is to offer an up-to-date assessment of the current state of ecolinguistics, synthesize the existing convergences and divergences within the field, and provoke reflections on potential directions of future research under the umbrella concept of “ecolinguistics”. The term “ecolinguistics” and its related concept “language and ecology” first appeared in Ref. [11] work on the interactions between language and its surrounding environment and since then the field has enjoyed a steady development as an emerging interdisciplinary field of linguistics and environmental studies. There have been a series of important developments within ecolinguistics since the 2000s. Studies engaging with the theoretical premises of ecolinguistics have appeared in high impact linguistic journals such as *Critical Discourse Studies*, *Language Sciences*, and *Discourse and Communication*. The establishment of the “language and ecology research forum” (<http://www.ecoling.net/>), which has been recently

renamed “the ecolinguistics association”) has created an online hub for communications and research collaborations among ecolinguistics scholars and practitioners. Textbooks such as [25] and [40] have become available for teaching ecolinguistics at both undergraduate and graduate levels and research programs dedicated to ecolinguistics have become available for prospective graduate students.

Furthermore, the accelerating degradation of our natural environment has made an urgent call for us to rethink the positivist worldview often taken for granted by mainstream linguistic research. As [38] argue, the idea of science as a unidirectional movement toward deeper insights, better methods, and human progress, needs to be put into question and ecolinguistics, with its commitment to ecological and dialectical epistemologies, has significant theoretical and practical implications for human's collective responses to the worsening situation of global ecological crises.

Why is now a good time for a content analysis of ecolinguistics? The answer lies in the diversification of the field and the need for further trans-disciplinary collaborations among environmental research fields. As [20] reports on a recent survey among members of the “language and ecology research forum”, the diversification of ecolinguistics research has generated some disagreements among researchers regarding the definition of the field. While some researchers prefer a unified view on ecolinguistics, referring it as “the study of the interdependence of language and the perception/interpretation of the natural world we live in”, others favor a more topical and surface oriented definition that keeps the field open-ended. Meanwhile, given ecolinguistics' ecological orientation, the field has a great potential for contributing to trans-disciplinary collaborations among environmental research fields such as environmental studies, ecology, and environmental communication. As this article will report later, however, the existing literature of ecolinguistics has demonstrated relatively limited theoretical

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impacts over other contingent environmental disciplines, which presents a worthwhile topic for further discussion.

Although a few theoretical syntheses on ecolinguistics and its key theoretical premises already exist e.g. Refs. [5,15,38,39], they have been mainly written from an “insider perspective”, focusing on specific developments of ecolinguistics. To date, very few studies have attempted to offer a systemic review of ecolinguistics’ overall research impact on both linguistics and other contingent ecological disciplines and how the field’s theoretical premises have been adopted by researchers (especially those outside ecolinguistics) in their own studies remains largely unexplored for exceptions, see Refs. [18,19]. As such, I hope that this article will help to provoke further conversations on potential theoretical dialogues between ecolinguistics and other contingent ecological disciplines.

Based on previous studies in relevant fields such as risk communication [9] and media representation of science and climate change [34,35], this article presents a systemic review of ecolinguistics as an emerging research field through a quantitative content analysis of relevant journal publications over the past 25 years (1991–2015). The article examines four basic, yet relevant dimensions of the surveyed journal publications: (1) when the respective studies were published, (2) what and where were these studies’ primary publication venues; (3) what research topics were addressed in these studies; and (4) how these studies proceeded methodologically. In doing so, the paper aims at analyzing to what extent ecolinguistics has grown and diversified over the past 25 years, what kind of “functional differentiations” have been achieved in this field, and what potential issues may need researchers’ attention for the field’s future development. However, before diving into the content analysis’ methodological designs and major findings, it is necessary for us to take a step back and take a brief historical overview of ecolinguistics.

2. Ecolinguistics: a brief overview

Since many scholars have offered cogent and reputable summaries of ecolinguistics’ historical development e.g. Refs. [5,15,18–20], this section will only provide a brief genealogy of the key developmental stages and theoretical insights that outline ecolinguistics’ disciplinary contour. Wilhelm von Humboldt’s (1767–1835) work on comparative linguistics and his view on the interdependency between language and the world has been widely regarded as the predecessor of ecolinguistics, which later on were incorporated into the “linguistic relativity hypothesis” by pioneers of anthropological linguistics in North America, such as Franz Boas (1858–1942), Edward Sapir (1884–1939) and Benjamin Whorf (1897–1941). To some extent, the famous yet controversial “Sapir-Whorf hypothesis”, the idea that a speaker’s perception of the world such as worldviews and cognitive processes is conditioned by his/her linguistic system, can be seen as the first explicit attempt to theorize the complex relations between languages and their surrounding contexts. As time went on, contestations over the validity of “Sapir-Whorf hypothesis” in North America influenced the establishment of cognitive linguistics whereas in Europe some scholars began to explore language-context interactions through ecological concepts.¹ As several leading practitioners of ecolinguistics e.g. Refs. [5,38] point out, the speech titled “the ecology of language” given by Ref. [11] at Center for Applied Linguistics in

Washington D.C. marked the “proper beginning” of ecolinguistics. Within this important speech [11], argued that language is part of a larger environment that is physical (a language’s users only exist in physical environment), psychological (a language interacts with other languages in the minds of bilingual and multilingual speakers), and sociological (a language interacts with the society in which it functions as a communication medium). Although many aspects of [11] argument are reflected in miscellaneous linguistic sub-fields such as anthropological linguistics, psycholinguistics, and sociolinguistics, it is his proposal of future research on language ecology, that is, “the study of interactions between any given language and its environment” (p. 325), that leads to later developments in ecolinguistics [8]. From this time onwards, references to the subject of language and environment or language and ecology occasionally popped up in linguistics publications.

Yet, it was until the 1990s the field of ecolinguistics really began to take off and consolidate as an emerging discipline distinctive from sociolinguistics [5]. This decade started with [10] keynote speech “new ways of meaning” at the 1990 World Conference of Applied Linguistics, in which he made connections between language and environmental issues, and to a less extent, between language and politics. Central to Halliday’s argument is his critique of “linguistic anthropocentrism”, which can be understood in two senses: on the one hand, in everyday communications nature and non-human creatures are often addressed in mere categories of usefulness, which demonstrates the sense of utilitarian anthropocentrism embedded in daily language usage; on the other hand, ecological issues are often escalated by discourses promoting non-sustainable actions. Halliday’s remark on the interplays between language and ecological issue broadened Haugen’s original elaboration of “language ecology”. The central role held by Halliday in the functional approach to language research also helped to promote the recognition of ecolinguistics among the entire linguistic community. Meanwhile, at the same conference the term “ecolinguistics” was formally introduced into the debate on language and ecology, which further enhanced the field’s visibility. The 1990s also witnessed the publications of [14] and [23]; two seminal books summarizing the achievements of ecolinguistics in its consolidating stage.

As we stepped into the new millennium, the field of ecolinguistics also moved into a new developmental stage, as suggested by a series of academic events dedicated to ecolinguistics (e.g. “30 Years of Language and Ecology” at University of Graz, 2000), the notable increase of book-length publications on this field especially [6,15,25], and the establishment of the “language and ecology research forum” in 2004. Most recently, a special issue on ecolinguistics was published in *Language Sciences* (2014/Jan), which offered an up-to-date evaluation of ecolinguistics’ past, present, and future. As [5] comments in his contribution to this special issue, “nowadays we can safely say that ecolinguistics is a well-established discipline” (p. 125).

In short, what is ecolinguistics? According to [40]; “ecolinguistics analyses language to reveal the stories we live by, judges those stories according to an ecosophy, resists stories which oppose the ecosophy, and contributes to the search for new stories to live by” (p.183). In other words, ecolinguistics seeks to explore linguistic phenomena found in inter-language, inter-human, and human-nature relationships from the perspective of ecological philosophy. In contrast to other subfields of linguistics, ecolinguistics adopts “ecosophy” as its principle normative framework. Central to ecosophy is the commitment to ecological equilibrium, which, unlike positivist worldviews, rejects the separation between human beings and nature under Cartesian dualism and proposes that ecological crises require not only scientific solutions but also moral introspections of anthropocentric activities [27].

¹ The distinction between North America and Europe here is not definitive since we can find ecolinguists (e.g. Einar Haugen and Adam Makkai) working in the U.S. and vice versa. Yet, current research practices within ecolinguistics indeed suggest that the “ecology of language” pioneered by Einar Haugen has been better received in Europe.

According to [20]; there are three interrelated yet distinctive theoretical strains in ecolinguistics: the “Haugenian tradition”, the “biolinguistic tradition”, and the “Hallidayan tradition”. The “Haugenian tradition” refers to studies following the work of [11]; which sees language as part of a larger ecology based on the mutual interactions among human mind, society, and natural environment. In one recent elaboration of this tradition [38], argue for a conceptualization of four types of “ecologies” that language is situated in. First, language exists in a symbolic ecology that includes the symbolic systems in the brain of a multilingual speaker or those co-existing a multilingual context. Second, language exists in a natural ecology that comprises the biological and physical surroundings in which it is spoken. Third, language exists in a socio-cultural ecology, the socio-cultural contexts that shape speakers and speech communities. Fourth, language exists in a cognitive ecology that is structured by the interactions between biological organisms.

In line with the “Haugenian tradition”, the “biolinguistic tradition” takes a more practical interpretation of the term “language and ecology”, viewing the existing multilingual system across the world as an ecological system and the extinction of minority languages resembles the loss of biodiversity in the world. This tradition was mainly marked by Refs. [30]; who coined the term “biolinguistic diversity” and argued for the necessity of preserving minority languages in this increasingly hegemonic world brought by globalization, with English functioning as the primary lingua franca for intercultural communications. The “biolinguistic tradition” is perhaps the most popular strain of ecolinguistics and the ecological metaphor on language diversity has been widely adopted by scholars working in the fields of language planning and anthropological linguistics [20]. Admittedly, the biomorphic view on language diversity proposed by the “biolinguistic tradition” has received many critiques as well. [32]; for instance, addresses the potential negative impacts of adapting biomorphic metaphors in language policy research: “we should be very wary of the political implications of the metaphors we use; the enumeration, objectification and biologisation of languages renders them natural objects rather than cultural artefacts” (p. 232).

Last but not least, the “Hallidayan tradition” can be traced back to [10] insight on the connections between language use and environmental degradation. As mentioned earlier, Halliday takes a functional approach toward language research and thus for him, the anthropocentric nature of human language makes it at least partially responsible for human being’s unecological conducts. Scholars following the “Hallidayan tradition” tend to situate their research in the intersection between ecolinguistics and critical discourse studies. [39,40]; for instance, proposes ecolinguistics as a form of critical discourse studies plus its ecocentric normative framework. According to [39,40]; the fact that contemporary media landscape is dominated by discourses promoting consumerism and material growth presents a central subject for ecological critiques and thus ecolinguistics can offer valuable theoretical and methodological contributions to creating ecological awareness. In a similar vein, Brigitte Nerlich [28,29] also addresses the importance of language in the current communication efforts of climate change and how metaphors such as “greenhouse effect” and “carbon footprint” lock us into defining, thinking and interpreting climate change from the perspective of risk assessment and management, instead of viewing it as a complex, multifaceted and cultural phenomenon.

Besides the above typology, there are other ways conceptualizing the current landscape of ecolinguistics as well. For instance [1], define ecolinguistics as the combination of “the analysis of ecological discourse” and “the ecological analysis of discourse”: while the former trend focuses on the analysis of discourses about

environmental issues, the latter refers to studying languages in an ecological way by treating them as species that can influence each other. As shown in the above typologies, however, the research topics of ecolinguistics overlap with other subfields of linguistics such as critical discourse analysis and sociolinguistics, which raise the question whether such overlap weakens the validity of ecolinguistics being an independent research field. Without question, this is a legitimate concern and my answer for it is that ecolinguistics is best understood not as a unitary discipline but as a cluster of interdisciplinary approaches concerning the study of language from ecological perspectives or in relation to ecological issues. As Bang and Tramp (2015) suggest, ecolinguistics needs to be recognized as an umbrella term covering two research traditions: “on the one hand traditional linguistic methods applied on texts and discourse of ecological importance and on the other hand deeper reflections on the theories of language inspired by the holistic paradigm of ecology” (p. 83). Recent studies bearing the “ecolinguistics” label are increasingly complex and multifaceted, which, while reflecting the field’s interdisciplinary nature, requires further research. Thus, a content analysis of ecolinguistics’ recent development would be a timely contribution for reviewing its current status as well as envisioning its future horizons.

3. Research design

Representativeness is a key factor for consideration for generating valid evaluations of a target research field and the content analysis here aims to provide a comprehensive “snapshot” of the current dynamics within ecolinguistics for researchers interested in this emerging field. For this purpose, there are three possible sampling strategies [34,35]: (1) to acquire any scholarly publication relevant to a discipline, (2) to take a random sampling among a discipline’s existing literature, and (3) to select the most representative publications of a discipline based on pre-set parameters. Clearly, the first two strategies seem to be unfeasible since they require not only a very high degree of prior knowledge of the target discipline’s historical details but also available databases that index all journals, book chapters, and conference proceeds of the target discipline. Based on previous studies on related environmental topics [9,34,35], the content analysis of ecolinguistics was conducted by analyzing relevant ecolinguistics publications in well-established scholarly journals over the past 25 years (1991–2015). The term “well-established scholarly journals” here refers to peer-reviewed journals that are indexed in three major academic databases on language and communication: Linguistics and Language Behavior Abstracts (LLBA), Communication & Mass Media Complete (CMMC), and Social Sciences Citation Index (SSCI). The exclusive focus on journal publications did not mean to downgrade the academic merits of conference proceeds, book chapters, and books. This decision was based on considerations from the perspective of scholarly communication and how “outsiders” would approach the field of ecolinguistics: journal publications are the most-circulated research outputs among academic communities of social sciences and for researchers with no or little prior knowledge of “ecolinguistics”, a quick search of journal articles in academic databases would offer a straightforward perception of the research field. As such, a quantitative assessment of existing journal publications on ecolinguistics would offer valuable insights on how ecolinguistics, as a newly established field in its infancy, is communicated within linguistics and contingent fields such as communication, sociology, and ecology. In terms of the academic databases used in the content analysis, LLBA is the definite research database on linguistics and it indexes publications in over 30 languages from 50 countries, which makes it the primary database for the current study. Given ecolinguistics’

Table 1
Numbers of ecolinguistics related articles published between 1991 and 2015.

Research topic time	Language learning and teaching	Theorization and historical analysis	Language policy and planning	Language in contact	Discourse analysis	Total
1991–1995	0	2	2	1	0	5
1996–2000	0	1	2	0	2	5
2001–2005	1	0	9	2	0	12
2006–2010	5	2	12	6	5	30
2011–2015	0	10	9	1	4	24
Total	6	15	34	10	11	76

interdisciplinary nature, the current study also searches relevant journal publications in CMMC, the leading database for communication and media studies, and SSCI, the most significant multidisciplinary index in humanities and social sciences.

Admittedly, using mainstream academic indexes for a content analysis has both advantages and disadvantages. As suggested by scholars working in critical information studies e.g. Refs. [31], these indexes tend to favor journals by commercial academic publishers over those open-access ones and English language based journals in North America and Europe are much easier to be indexed than those published in other languages or other geographical locations. Nonetheless, the positive points of using these indexes seem to outweigh their limitations: these indexes tend to be the starting points of many scholars for literature review and their information gathering and diversification has been improved over the past decade.

To be specific, the surveyed journal publications were selected as follows. The data selection process started with a general full-text search in LLBA, CMMC, and SSCI, with the keyword “ecolinguistics OR language and ecology” and the time parameter was set between January 1991 and December 2015. As mentioned earlier [10], keynote at the 1990 World Conference of Applied Linguistics significantly increased ecolinguistics’ visibility within the linguistics community and thus the data collection took 1991 as the starting point. This search ended up with a large corpus including various publications and each piece within this preliminary sampling pool was then screened individually. Only publications in peer-reviewed journals with explicit discussions (i.e. those adopting ecolinguistics as a key component of their theoretical frameworks) on ecolinguistics or language and ecology were retained. The data selection ended up with 76 relevant journal publications² (see Appendix for the complete list of surveyed articles).

Following the analytical frameworks in Refs. [34] and [35]; these selected studies were then coded in terms of four basic yet relevant dimensions: (1) when the respective studies were published, (2) what and where were these studies’ primary publication venues; (3) what topics were addressed in these studies; and (4) how these studies proceeded methodologically. These coding questions were designed to systemically evaluate journal-publishing practices of ecolinguistics and to identify both strengths and weaknesses of the field. The next section will present major findings from the data analysis.

4. Results

Coding question (1) focuses on the general presence of ecolinguistics research activities in terms of journal publications since 1991. As shown in Table 1, there has been a steady increase of journal publications on ecolinguistics since 1991, with and the

majority of the surveyed articles (56 out of 76) being published over the past decade. It should be pointed out that the slight decrease of publication numbers during 2011–2015 does not indicate the decline of research attention to ecolinguistics since many journals have an embargo time of 1–3 years for indexing and thus the result of the 2011–2015 period is subject to change. Overall, the noticeable increase of journal publications since 2006 indicates the growing interests on ecolinguistics among linguists and improving institutional support for ecolinguistics research.

The increase of journal publications on ecolinguistics is also accompanied by a noticeable diversification of research topics within ecolinguistics. While “language policy and planning” remains the dominant research topic within ecolinguistics throughout the surveyed period, there has been a noticeable growth of studies applying ecolinguistics theories in contingent fields such as discourse analysis and interestingly, language learning and teaching. For instance, among the surveyed articles [24] ethnographically examined a common-sense performer metaphor in a Western nature tourism setting and highlights how metaphors mediate the processes of involvement with/in nature [16], adopted ecological perspectives on both L1 and L2 language acquisition by addressing how language learners acquire symbolic competence in various socio-cultural contexts. The above finding confirms [20] assessment that a certain degree of “functional differentiation” has been achieved within ecolinguistics, with the contours of different research strands being formed.

Coding question (2) examines the surveyed articles’ publication venues, which offers a general indicator for the global dissemination of ecolinguistics research practices. As Table 2 shows, almost all (73 out of 76) of the survey studies are published in North America and Europe, with Mainland Europe (especially Netherlands) being the leading location (n = 32), followed by the United States (n = 20) and the United Kingdom (n = 21). This result corresponds to [18,19] previous finding and is more or less expected since currently all the leading publishers of linguistics research (e.g. Elsevier, Wiley-Blackwell, Taylor-Francis, and Sage) and the majority of ecolinguistics’ leading proponents, such as Alwin Fill, Arran Stibbe, and Adam Makkai, are located in North America and Europe.

Another aspect indicating the dissemination of ecolinguistics theories, especially among researchers working in contingent fields is the aims and scopes of journals publishing ecolinguistics articles. As shown in Table 3, the primary publication venues delivering ecolinguistics pieces are those focusing on general linguistics (n = 25) and sociolinguistics (n = 25) (the venues’ primary fields are identified through reading their “aim and scope” sections). A further qualitative examination of these journals’ titles further reveals that while the concept of ecolinguistics has been introduced in several high impact international journals with a wide range of audience, such as *Critical Discourse Studies*, *Discourse and Communication*, and *Language Sciences*, the journals preferred by ecolinguistics pieces remain those targeting specific readership of anthropological linguistics and sociolinguistics, such as *Anthropological Linguistics*, *Current Issues in Language Planning*, and *International Journal of the Sociology of Language*.

² The content analysis excluded articles published on *Language and Ecology*, the journal managed by the “language and ecology research forum” since the journal currently is indexed by LLBA, CMMC, and SSCI, which means it is less likely found by “outsiders” of ecolinguistics.

Table 2
Publisher locations of the surveyed studies.

Publisher location	United States	United Kingdom	Mainland Europe	Other
Number (total = 76)	20	21	32	3

Table 3
The aims and scopes of journals publishing the surveyed studies.

Journal's focusing field	General linguistics	Sociolinguistics	Language teaching	Discourse analysis	Other
Number (total = 76)	26	25	13	7	5

Table 4
Research method employed by the surveyed studies.

Research method	Ethnography	Policy analysis	Literature review and synthesis	Qualitative discourse analysis	Quantitative survey and experiment
Number (total = 76)	17	13	38	6	2

Meanwhile, a closer look at the research subjects of the surveyed articles demonstrates that the three traditions of ecolinguistics (i.e. the Haugenian tradition, the biolinguistic tradition, and the Hallidayan tradition) are not taken up equally. As Table 1 shows, these studies can be generally divided into five categories according to their research subjects (the naming of these research subjects is based on the keyword indexes used by LLBA, CMCC, and SSCI): (a) Language Learning and Teaching (studies applying ecological perspectives in analyzing language teaching and learning processes), (b) Theorization and Historical Analysis (non-empirical pieces advancing theorization and synthesis of ecolinguistics), (c) Language Policy and Planning (studies addressing language policy issues), (d) Language in Contact (studies focusing on anthropological examinations on interactions between language systems), and (e) Discourse Analysis (studies on analyzing environmental discourses). If we further group these categories according to [20] typology, then categories (b), (c), and (d) include studies following the Haugenian and biolinguistic traditions whereas categories (a) and (e) refer to those following the Hallidayan tradition. Noticeably, the result that category (e) only takes a very small percentage of the surveyed articles (11 out of 76) contradicts with the dramatic growth of studies on media coverage of climate change and environmental issues, among which analysis of environmental discourses is a major research practice see Refs. [34,35]. Meanwhile, in terms of research subject, there seems to be a vertical imbalance between macro and micro research since the majority of the surveyed publications addressing policy issues at the national level, leaving many meso-level and micro-level issues untouched.

Last but not least, when analyzing the research methods used by the surveyed articles, the results indicate a diversified picture. As shown in Table 4, while half of the publications (38 out of 76) remain non-empirical essays focusing on literature review and theoretical synthesis, empirical studies, especially qualitative ones based on ethnography (including both field studies and classroom observations) and macro policy analysis have been widely adopted by researchers to addressing the ecological nature of linguistic systems.

5. Discussion and conclusion

The content analysis presented here reviews the development of ecolinguistics over the past 25 years from the perspective of journal publishing practice. In line with previous theoretical discussions [1,2], one important insight from the analysis is how

“ecolinguistics” and “language ecology” are best to be understood as umbrella terms describing a highly interdisciplinary field, as suggested by the diversity of the surveyed publications. The results also demonstrate that ecolinguistics has received growing research attention within linguistics, as indicated by its increasing publications in scholarly journals, diversifying research topics, and mixture of various research methods. These indicators present a positive prospect of the future of ecolinguistics: it can be predicted that ecolinguistics, with its dedication to the interaction between language and the environment, will become an increasingly important research area and we would expect to see the further growth of ecolinguistics publications in various forms in the coming years.

Nonetheless, the current analysis also identifies several “points of contention” within ecolinguistics, which, depending on their outcomes, will significantly influence the field’s future research directions. Given the growing research interest on language and environment among scholars, these issues are worth further discussion. Just to be clear, the following discussion is only meant to provoke further conversations on potential developments within ecolinguistics, instead of proposing a definitive view of this newly formed field.

First, as shown in Table 1, the majority of ecolinguistics articles published between 1991 and 2015 fall into the Haugenian and biolinguistic traditions, which contradicts the prevalence of environmental discourse research. One possible explanation for such “mismatch” is that there seems to be a notable gap between ecolinguistics scholars and those working in contingent fields, or, according to [39] categorization, between “the ecological analysis of language/discourse” and “the analysis of ecological discourse”. Indeed, although it would be expected that the proliferation of environmental discourse research in recent years would naturally incorporate ecolinguistics theories and improve the field’s visibility, the data analysis reveals that this is only partially true: to date, very few environmental discourse studies, at least in terms of journal publications, have adapted the term “ecolinguistics” or effectively engaged with ecolinguistics theories [34,35].

Thus, one interesting point for further consideration among current and future practitioners of ecolinguistics would be whether future research practices within ecolinguistics should be more politically engaged in line with the normative stance followed by many environmental discourse studies. As one respondent in Ref. [20] survey claimed, ecolinguistics may not be a true sub-discipline of linguistics since it is “too-biased” and “full of tree-hugging types”. This apolitical stance has also been taken by many studies in the current content analysis since they are

concerned with saving minority languages or conceptualizing language systems from the holistic paradigm of ecology, rather than environmental issues or texts with ecological importance. Admittedly, there is no doubt that theoretical explorations on linguistic systems and their resemblances with ecological systems can promote multilingual awareness or trigger a holistic view on human-nature interactions. Yet, we may wonder whether such indirect approach can only promote changes at the *transactional level*. As revealed by recent discussions on indigenous experiences in Canada, maintaining and revitalizing minority language cannot be separated from the nation-wide discussions on the recognition and reconciliation of Canada's past and present colonial practices and more importantly, the deep understanding of the inseparable connections between language policy and systems of power and racial hierarchies [12]; for alternative indigenous politics in Canada, see Ref. [4]. The same argument also applies to texts with ecological importance, given the important role played by discourse in sustaining unsustainable consumerism and capitalist fetishism on material growth [28,40].

Then, how can ecolinguistics deal with the above challenges and stimulate *transformative* changes? One possible direction for future ecolinguistics research may be to get more engaged with environmental politics and to move toward a progressive rethinking of human-nature relation. This may sound radical, but recent ecolinguistics work such as [40] and [29] have shown how such approach can further promote ecolinguistics a unique sub-discipline of linguistics in its own rights. The argument here is by no means degrades the merits of research on language policy, language contact, and theoretical issues of ecolinguistics. Yet, it seems that politically engaging studies, such as those in category (e) in the current analysis, can be more effective in terms of directly confronting capitalist material growth and unsustainable consumerism as well as engaging the general public at the behavioral level. In addition, being politically engaging may also bridging the epistemological gap between ecolinguistics and other contingent disciplines such as environmental communication, environmental education, and critical discourse studies.

Fortunately, in recent years we have seen the emergence of academic pieces that explicitly address the challenge of cross-disciplinary consolidation e.g. Refs. [1,39]. As [39] correctly points out, ecolinguistics can be a crucial venue for resisting discourses of economic growth, advertising and intensive agriculture by “promoting *critical language awareness* [13] of the potentially damaging effects of the discourse and providing materials that can be useful in resisting it” (p. 122). In this regard, confronting problematic environmental narratives, such as discourses celebrating consumerism, material growth, and environmental deregulation can be a key direction for future inquiries of ecolinguistics [39].

In addition to the above contention on what normative stance ecolinguistics should take, it is also worthwhile for us to consider whether the notion of (ecological) justice could be better incorporated into future ecolinguistics research. The analysis of the surveyed journal publications has found very few instances where (ecological) justice issues have been explicated addressed. This is by no means an indication that ecolinguistics does not care about (ecological) justice. Are concerns over language diversity or English's over-dominance as a global lingua franca not an implicit expression of liberal pluralism? Given the notion of justice' close connotation with improper distribution and unfairness, it is unfortunate to find that the commitment to (ecological) justice, at least among the surveyed publications, remains a less-elaborated aspect. Contemporary ecological crises (climate change, as well as other issues such as diminishing biodiversity and the rapid decline of habitat) are perhaps the great challenges ever faced by human civilization. Ecolinguistics, with its close connections with ecology,

has to give its own responses. To a large extent, the repetitive failure and disappointments of global environmental negotiations suggest how anthropocentric ideologies dominate the contemporary landscape of international environmental politics and it is evident that environmental issues are political issues instead of scientific disagreements [7]. How do we swallow the fact that the Global South (especially countries in Africa and Latin America), which contributes the least to the climate change, has to suffer the most from the warming climate? What should be done for the recognition existing environmental injustice? What procedures should be set on the global stage for negotiating the different economic and political interests of various states? Shall we recognize environmental rights as a basic human capacity for prosperity? It seems that ecolinguistics, with its unique insights on the interactions between language and ecology, would make important contributions to the above questions. As such, future directions of ecolinguistics, in my opinion, will be heavily influenced by the field's responses to challenges imposed by global ecological injustice and the dominance of capitalist ideologies.

Meanwhile, as shown in Table 2, very few non-English journals have published ecolinguistics related articles, which is likely to be caused by the lack of indexation of non-English academic journals in LLBA, CMMC, and SSCI. This finding indicates that the dissemination process of ecolinguistics research has been somewhat constrained to the Global North. Similarly, although there are a couple of studies dealing with non-Western research subjects (e.g. Refs. [26,33,36]; etc.), almost all studies within the data have taken a Western epistemological stance. Given the fact that many ecolinguists are critical about English's undue dominance of international communications, a valuable topic for further discussion among ecolinguistics practitioners is how ecolinguistics could better research people and languages in the Global South. One possible solution for this issue is to better incorporate non-Western epistemologies in future ecolinguistic research for a more holistic understanding of the complex human-nature relations. Recent research in environmental communication has explicitly linked contemporary ecological crises to Western ideas of modernization and individualism [7,17]. Indeed, as [25]; one of the key proponents of ecolinguistics, comments on the limitation of Western environmentalism:

“The environmental ideology existing in most Western societies is that it is responsible individual choices that will save the Earth. While local improvements can indeed result from individual choices, it remains unclear what global impact those choices can have in view of power politics, large scale environmental crime and continued widespread ignorance and indifference. [...] I am concerned about the trend to blame individual consumer's moral responsibility for policies and social processes which are beyond the control of individuals.”

[25]; p.201)

How will ecolinguistics respond to the contemporary ecological crises? as required by ecolinguistics' anti-hegemonic commitment and the fact that the alarming ecological degradation requires collective responses of the entire human civilization, future ecolinguistics research may consider diversify its research practices in two senses: (1) the field should be promoted and communicated in multi-languages and across various geographical boundaries; and more importantly, (2) it should be locally grounded yet globally minded by incorporating non-Western epistemologies for a better understanding of the complex human-nature relations. It should be noted that similar proposals have also emerged in contingent linguistic fields: there have been fierce discussions within critical

discourse studies regarding non-Western intellectual traditions (e.g. Chinese philosophy) potential contributions to critical scholarship's adaptation in a new global intellectual environment [3,37].

Last but not least, the content analysis also reveals a couple of specific aspects that future ecolinguistics research may seek to improve. In terms of research topic, the results in Table 1 demonstrate that currently ecolinguistics research has mainly dealt with issues at the macro-level such as language policies in different countries. In this regard, future research focusing on validating ecolinguistics hypothesis at the micro-level would be welcomed, such as exposing how everyday discourses legitimize materialist definitions of "good life" or examining how daily metaphors imply certain perceptions of interactions among human being, other species and the physical environment. In terms of research method, the results in Table 4 make it clear that currently qualitative research designs are preferred by ecolinguistics. Undoubtedly, qualitative research designs allow for exceptional sensitivity and are able to capture subtle elements that shed light upon the complex language-ecology interactions underlying everyday routines, but for some linguists, such approaches can pose considerable problems of replicability, generalizability and representativeness [21]. Thus, while we should continue to gain insights on language and ecology using interviews and other qualitative methods, a promising direction for future ecolinguistics research is quantitative-oriented strategies involving corpus-driven or experimental methods. In terms of publishing practice, ecolinguistics has been only vigorously discussed within some sub-disciplines of linguistics so far, as shown in Table 3. Given the complexity of contemporary environmental crises and the highly interdisciplinary nature of ecolinguistics, ecolinguistics practitioners may consider going beyond the disciplinary boundary of linguistics and seek to present their work to a wider audience in other humanities and social sciences disciplines, which would benefit the further development of this field.

In short, research activities on ecolinguistics have grown strongly since the 2000s. While the field is still primarily characterized by studies in language policy/planning, it has begun to move beyond its initial research agenda through incorporating more types of topics and various methodological approaches. As a young sub-discipline of linguistics, there are many potentials within ecolinguistics for promoting future interdisciplinary research on the mutual interactions among human mind, society, and natural environment.

Admittedly, this study is exploratory in nature and its limitations should be noted. The above findings and discussions have been solely based on indexed journal publications of ecolinguistics and thus they cannot be generalized as the definite assessment of ecolinguistics' development over the past 25 years. As mentioned earlier, the content analysis is primarily conducted from an outsider perspective, seeking to find out how ecolinguistics would be perceived by researchers from contingent disciplines. A more comprehensive examination of ecolinguistics would incorporate key books, book chapters, and conference proceedings and consider more non-Western publication venues if possible. Another limitation comes from the use of LLBA, CMMC, and SSCI as source databases. Although these databases have significantly improved their multilingual inclusiveness over the past decade, their attention to non-English publications remains secondary. Unfortunately, a systemic critique of the current indexing practices in academic publishing industry is far beyond the scope of the current study. As stated in the Introduction, the primary goal of this article is to provoke further conversations on potential theoretical dialogues between ecolinguistics and other environmental research fields. In this regard, there is no doubt that much more ecolinguistics research would be required and it would be beneficial to see follow-

up meta-analyses after one or two decades.

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Appendix: Surveyed journal publications of ecolinguistics

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