

RESEARCH TIMELINE

# Ecological systems theory and second language research

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## Introduction

“Context” has been increasingly featured and acknowledged in second language (L2) research because L2 teaching is recognised to be shaped by the environments in which it is situated. Numerous theoretical perspectives were introduced to L2 research that aim to capture the contextual forces at work in teaching and learning, including but not limited to Activity Theory, Complexity Theory, and Sociocultural Theory. Activity Theory holds that a learner’s motives (human needs directed towards an object) are highly malleable, subject to the influence of such contextual variables as institutional rules, community, tools and artefacts available (see Leont’ev, 1978, 1981 who popularised Activity Theory from Sergei Rubenstein’s founding and also Engeström’s more current work in 1999). Complexity Theory, which has been widely adopted in both physical and social sciences, originates from physics (Martin et al., 2019). Complexity Theory was later introduced into L2 research by Diane Larsen-Freeman who posits that language learning is not only a process but a volatile and emerging system that is shaped by components of the system (e.g., learners, teachers, schools) engaging in constant and vibrant interactions (Larsen-Freeman, 2014). Sociocultural Theory highlights the sociocultural contexts where learning takes place (Lantolf, 2000; Vygotsky, 1978). Informed by a social constructivist view of learning, key concepts such as scaffolding (e.g., teachers’ support for learners) are put forward. In particular, Vygotsky argues that communication plays an indispensable role in language learning. Extrapolating Vygotsky’s work to L2 research, Swain (2006) claims that *LANGUAGING*, dialogues among learners to discuss issues in L2 learning, is an important process of learning a L2.

These social constructivist theories refer to context in general terms. For instance, Complexity Theory describes the nature of context (one that is volatile and subject to change); Activity Theory examines how learning is mediated by “tools” (e.g., textbooks) and “community”; and Sociocultural Theory focuses on the broader socio-political and cultural landscape where learning and teaching takes place. From the perspective of conceptualisation of context, it appears that there is a need for a more granular view of *CONTEXTS* (as opposed to context as a singular concept), which enables L2 researchers to identify various contextual forces and the interactions among them. It is therefore the purpose of this timeline to offer an alternative theoretical perspective, Ecological Systems Theory (Bronfenbrenner, 1979\*), which has been introduced to L2 research for some time, although receiving less attention. Ecological Systems Theory offers a unique perspective regarding “contexts” because it adopts a more granular and systematic approach to conceptualising contexts than the other theories. Having said that, it must be acknowledged that boundaries between layers of “contexts” are blurry, especially in light of the widespread use of technology in education that enables L2 learning to take place beyond the classroom.

Ecological Systems Theory employs a metaphorical use of the terms “ecology” and “ecosystem” to conceptualise contexts. Ecology is a sub-field of Biology that focuses on the relationships between

living organisms and the physical components of the habitats of living organisms, the ecosystem (van Lier, 2014\*). In educational research, with the advent of the social constructivist view of learning and teaching, the notion of “ecology” or “ecosystem” has been borrowed by researchers to refer to the environments where learning takes place. An ecological perspective is theorised by Bronfenbrenner (1979\*) when he puts forward his seminal nested Ecological Systems Theory framework, which comprises four layers of context: MICROSYSTEM, MESOSYSTEM, EXOSYSTEM, and MACROSYSTEM. Neal and Neal (2013\*) further highlight the temporal aspect of context and bring to the fore an additional dimension of context: CHRONOSYSTEM, which was not explicitly mentioned in Bronfenbrenner’s book. In the same paper, Neal and Neal put forward a networked version of Ecological Systems Theory. While retaining the five layers of ecosystem, they redefine the notion of “setting” in Bronfenbrenner’s (1979\*) model. Bronfenbrenner defines “setting” as a location or physical space where people interact. However, given the increasing use of technology in communications, Neal and Neal (2013\*) argue that setting is more appropriately understood as face-to-face and virtual interactions among people, focusing on the people rather than places. When presented diagrammatically, a nested Ecological Systems Theory reveals that layers of context form a series of concentric circles, while ecosystems in a networked Ecological Systems Theory are represented by discrete circles, which are connected by the people engaged in interaction in those contexts. In Table 1, we attempt to unpack the meanings of the five ecosystems with an example relevant to L2 learning and teaching.

In social sciences, there has been budding interest in conducting ecologically valid research (Lewkowicz, 2001), for example, in the form of naturalistic classroom-based research. An ecological perspective was introduced to the language education community by van Lier in his 1997 article on adopting an ecological lens to language classroom observation research. van Lier draws on Bronfenbrenner’s (1979\*) and Gibson’s (1979) seminal work to discuss two approaches to classroom observation: microanalytical (an emic approach to research) and macroanalytical, with the latter referring to Bronfenbrenner’s (1979\*) four layers of context. van Lier (1997\*) also introduces the notion of AFFORDANCE that refers to the alignment between learners’ needs and environmental design. Following van Lier (1997\*), a series of conceptual works were published, discussing various aspects and notions of Ecological Systems Theory, namely, types of interactions between individuals and contexts (Tudor, 2003\*), temporal aspect of context (Kramsch, 2008\*), an emic approach to research (Lafford, 2009\*). These publications laid the groundwork for establishing a firm theoretical and conceptual basis for introducing Ecological Systems Theory into L2 research. Since then, aspects of Ecological Systems Theory have featured in L2 research in various topics, most evidently in the areas of computer-assisted language learning, language policy, language teacher education, and L2 classroom instruction. In this timeline, we aim to include key and recent publications related to the following themes:

- A. Conceptualisation of an ecological perspective
- B. Ecological research/perspective on computer-assisted language learning
- C. Ecological research/perspective on language policy
- D. Ecological research/perspective on L2 teacher education
- E. Ecological research/perspective on L2 classroom instruction
- F. Ecological research/perspective on L2 assessment

Given the transdisciplinary nature of Ecological Systems Theory, selected works vis-à-vis conceptualisation (Theme A) extend beyond L2 research. To make the timeline relevant to L2 researchers, only primary L2 research informed by Ecological Systems Theory is included (Themes B–F). The focus of this timeline is on Ecological Systems Theory and L2 learning and teaching in naturalistic instructional settings that considers sociocultural influences, which is not to be confused with the broader meaning of the term “ecological” in applied linguistics, second language acquisition (SLA), and instructed second language acquisition (ISLA) research. In applied linguistics (especially in sociolinguistics), the term “language ecology” is used synonymously with “linguistic landscape” (for example, see publications in the journal *Language Ecology*, published by John Benjamins). The notion of “ecology” is

**Table 1.** Definitions and examples of the five ecosystems

Ecosystem	Definition	L2 example
Microsystem	The setting where the focal individual interacts with others	The language classroom where the learner (focal individual) interacts with the teacher and other learners
Mesosystem	The setting where interactions between two or more social groups of the focal individual take place, involving the focal individual	Dialogues between the learners' (focal individual) two peers about learning a language
Exosystem	The setting where the focal individual is excluded from the interaction	Consultative fora between representatives of language educators and government officials
Macrosystem	The social, cultural, and political setting	The introduction of school-based assessment into the language curriculum
Chronosystem	The temporal change of the other four settings around the focal individual	The rise of the use of social media and technology in language learning

also featured in the work of Jay Lemke (2000) on discourse and social dynamics, Jan Blommaert (2010) on timescales in globalised contexts, Uryu et al. (2014) on the ecology of intercultural interaction, and the field of ecolinguistics (e.g., Bang et al., 2007; Fill & Mühlhäusler, 2001; Stibbe, 2015). In SLA research, the edited volume by Leather and van Dam (2003) focuses on ecology and language acquisition that extends to non-instructional contexts. Regarding the established line of SLA research on task-based language teaching, albeit its focus on instructional setting, it rarely considers the role of contexts outside of the language classroom (Long, 2016). In ISLA, the interpretation of “ecology” is restricted to only classroom settings (in lieu of broader sociocultural settings) and ISLA research focuses on efficacy of pedagogical interventions rather than how contextual forces influence language acquisition (Loewen, 2014). In short, although we are aware of the connotative meaning of “ecology”, the inclusion of this body of important work is beyond the remit of our timeline.

When selecting the entries to be included in the timeline, we consider importance of the publications, that is, classic work frequently cited in L2 research that adopts an ecological perspective (e.g., Bronfenbrenner, 1979\*; van Lier, 1997\*). More recent publications are also included, including a number that were published in 2021, to demonstrate the growing use of the theory in various sub-fields of applied linguistics. It must be noted that despite the long history of development of Ecological Systems Theory since 1979, its application to L2 research has only been recently taken up, resulting in a prolific growth in the amount of L2 ecological research in post-2019, especially in 2021.

When selecting L2 primary studies that employ Ecological Systems Theory, we take into account depth and explicitness of discussions of Ecological Systems Theory in the publications. In other words, we do not automatically include a publication that claims to adopt an ecological approach; rather, we review publications and include those that dedicate specific sections of the manuscript to discussing Ecological Systems Theory or its components. Another criterion for including L2 primary research is its substantive focus: we would like to include publications from a variety of sub-fields in L2 research to illustrate applications of (aspects of) the theory.

In the research timeline below, which contains 31 entries published between 1979 and 2021, in addition to summarising the original contributions of each piece of work, relationships among the works are highlighted through small capitals whenever possible to demonstrate developments in the conceptualisation, operationalisation, and/or evaluation of L2 learning ecologies. From the timeline, there has been a widespread uptake of Ecological Systems Theory in L2 research, especially in areas related to computer-assisted language learning, language policy, L2 teacher education, L2 classroom instruction, and L2 assessment. Earlier work is mostly conceptual, introducing components of Ecological Systems Theory and underscoring its relevance and usefulness as a theoretical lens to L2 research. More recent

publications, mainly adopting a qualitative research design, apply Ecological Systems Theory to examine sources of influence of L2 learning and teaching. Having said that, the majority of the reviewed studies demonstrate a fragmented application of Ecological Systems Theory, referring to specific notions of the theory such as “affordance” and “mutuality” rather than the philosophical underpinning of the theory (e.g., its eco-sociocultural view towards social phenomena, and its relationship with other sociocultural theories). Moreover, the central tenets of Ecological Systems Theory – interplay among (1) layers of contexts, and (2) contexts and people – are not captured in some of the reviewed studies. For example, some (e.g., Song & Ma, 2021\*) focus on specific levels of contexts mentioned in Ecological Systems Theory rather than adopting a holistic view towards contexts, forfeiting the opportunity to examine the relationships among various contextual dimensions. Some (e.g., Hofstadler et al., 2021\*), on the other hand, focus solely on contexts, neglecting the fact that people within the contexts are agentic beings who are not only influenced by the environments they are in but actively reshape the environments. With this timeline, we aim to introduce Ecological Systems Theory to the broad field of L2 research, demonstrating its usefulness as a theoretical framework. At the same time, we call for a more holistic and fine-grained understanding of the theory.

## Note

\* Indicates the full reference is available in the timeline itself.

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Year	References	Annotations	Theme(s)
1979	Bronfenbrenner, U. (1979). <i>The ecology of human development: Experiments by nature and design</i> . Harvard University Press.	In this seminal book, <b>Bronfenbrenner</b> sets out to discuss the usefulness of “an ecological orientation” to researching and understanding human development. He then presents a nested framework of Ecological Systems Theory, focusing on four types of contexts: <small>MICROSYSTEM</small> , <small>MESOSYSTEM</small> , <small>EXOSYSTEM</small> , and <small>MACROSYSTEM</small> . Since then, the theory has then been widely influential, informing the conceptualisation of an ecological perspective in many of the entries in this timeline.	<b>A</b>
1997	van Lier, L. (1997). Observation from an ecological perspective. <i>TESOL Quarterly</i> , 31(4), 783–787. doi:10.2307/3587762	<b>van Lier</b> provides an overview of the history of ecological approaches in various disciplines such as biology and psychology. He was the first scholar to apply the notion to lesson observation in language classrooms, defining an ecological perspective as the interactions between learners and learning environments. Turning to methodologies of ecological research, van Lier discusses two approaches: <small>MICROANALYTICAL</small> and <small>MACROANALYTICAL</small> . The former focuses on language learning in classroom contexts. As for the latter, van Lier draws on <small>BRONFENBRENNER’S (1979)<sup>1</sup></small> nested ecological systems theory to outline the layers of context, or “ecosystems”, which extend beyond the classroom.	<b>A</b>
2003	Tudor, I. (2003). Learning to live with complexity: Towards an ecological perspective on language teaching. <i>System</i> , 31(1), 1–12. doi:10.1016/S0346-251X(02)00070-2	In his commentary, <b>Tudor</b> underscores that language teaching and learning is an increasingly complex process due to the advent of computer-assisted language learning. Referring to <small>VAN LIER (1997)</small> , Tudor argues that an ecological perspective enables researchers to capture learner-centredness and individual learners’ interactions with their learning environments. The original contribution of this work lies in the conceptualisation of factors that affect such interactions: <small>PSYCHOLOGICAL</small> , <small>COGNITIVE</small> , <small>EXPERIENTIAL</small> , <small>SOCIOCULTURAL</small> , and <small>IDEOLOGICAL</small> . This resembles <small>BRONFENBRENNER’S (1979)</small> nested ecological systems theory but also considers individual learner differences. To address the complexity of the language learning process, Tudor appeals for the value of emic research that emphasises experiences of participants as insiders.	<b>A</b>

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Year	References	Annotations	Theme(s)
2004	van Lier, L. (2004). <i>The ecology and semiotics of language learning: A sociocultural perspective</i> . Springer.	<b>van Lier</b> continues his exploration of an ecological view towards issues pertaining to language education, following VAN LIER (1997) that focuses narrowly on the application of an ecological perspective to language classroom observation. In this book, van Lier discusses the applicability of an ecological worldview for researching language learner identity, language learning development, and critical language pedagogy. In addition, van Lier argues for a need to take into account both macro (e.g., language policy) and micro (e.g., learner psychology) aspects of language learning ecology. van Lier writes about the resemblance between an ecological approach to research and Sociocultural Theory, and how such an approach can further advance language education research informed by Sociocultural Theory.	A
2005	Garner, M., & Borg, E. (2005). An ecological perspective on content-based instruction. <i>Journal of English for Academic Purposes</i> , 4(2), 119–134. doi:10.1016/j.jeap.2004.08.002	This article begins with a presentation of an ecological view of language and communication. As one of the first publications to apply an ecological view to English for Academic Purposes (EAP), <b>Garner &amp; Borg</b> contend that this perspective perceives language use in EAP as holistic, dynamic, and situated within various disciplinary communities where the language is used. Using an EAP course as an example, the authors identify the potential for adopting a content-based approach in EAP courses to create an environment for engaging in authentic use of academic language in different academic disciplines.	E
2005	Hu, G. (2005). Contextual influences on instructional practices: A Chinese case for an ecological approach to ELT. <i>TESOL Quarterly</i> , 39(4), 635–660. doi:10.2307/3588525	<b>Hu's</b> study focuses on the exosystem and macrosystem elements of BRONFENBRENNER'S (1979) framework to apply an ecological lens to researching language policy. Focusing on English Language Teaching (ELT) policy in China, Hu compares ELT practices in Chinese secondary schools in different parts of China to identify contextual factors that affect teachers' implementation of official ELT policies. Findings from this survey-based study reveal great disparity between ELT practices in more and less affluent regions in China. Specifically, more developed areas tend to adopt some form of communicative language teaching while traditional ELT methodologies are more pervasive in less developed parts of the country. Hu concludes that ELT in classrooms is influenced by sociocultural and economic forces. He attributes the limited success of Chinese ELT reforms to their prescriptive orientation without taking into account regional differences.	E

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Year	References	Annotations	Theme(s)
2008	Kramsch, C. (2008). Ecological perspectives on foreign language education. <i>Language Teaching</i> , 41(3), 389–408. doi:10.1017/S0261444808005065	When discussing an ecological frame of mind about second language acquisition (SLA) in her plenary speech, <b>Kramsch</b> draws on Larsen-Freeman’s Complexity Theory to identify five major tenets of an ecological theory of SLA: relationships between self and others, the chronological aspect of the ecology, language learning as an emergent process, problematisation of the notion of speech communities, and repeated patterns of events. Kramsch closes by providing an example of multilingual language ecology and discussing implications for foreign language teachers. The value of this piece lies in Kramsch’s explicit comparison between Ecological Systems Theory and Complexity Theory.	A
2009	Berglund, T. Ö. (2009). Multimodal student interaction online: An ecological perspective. <i>ReCALL</i> , 21(2), 186–205. doi:10.1017/S0958344009000184	This study extends the application of Ecological Systems Theory to online language learning environments. Reviewing work by VAN LIER (1997) and others, <b>Berglund</b> postulates that an ecological approach to researching language learning in virtual environments should capitalise on language learners’ perception of affordances of learning spaces. Berglund also draws a parallel between such an ecological perspective and Vygotsky’s Sociocultural Theory, highlighting the situatedness of language learning. Focusing on learners’ multimodal online interactions using a videoconferencing tool, findings suggest that learners’ participation rates and conversational strategies were influenced by not only contextual factors, such as technological tools and communicative tasks, but also learners’ individual differences, including learning experiences, and speaking styles. In this way, this study emphasises the interplay between context and learners.	B

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Year	References	Annotations	Theme(s)
2009	Lafford, B. A. (2009). Toward an ecological CALL: Update to Garrett (1991). <i>Modern Language Journal</i> , 93(S1), 673–696. doi:10.1111/j.1540-4781.2009.00966.x	This introduction to a special issue on computer-assisted language learning (CALL) includes extensive discussions on an ecological approach to language use and language education. Referring to VAN LIER (1997) and KRAMSCH (2008), <b>Lafford</b> discusses the affordances of adopting an ecological framework as an analytical lens through which to examine issues and trends in CALL. In particular, the metaphorical use of the notion of ecology is useful in unravelling the seamless interrelatedness between the social, cognitive, and environmental dimensions of language learning using technology. Reiterating VAN LIER (1997) and TUDOR (2003), Lafford posits that the key tenets of an ecological approach to language study include such principles as the adoption of emic approach to research, the conception of language as context-specific, and language use as a dynamic, non-linear process. Lafford concludes the section on the ecological perspective by stressing that CALL research aiming to investigate efficacy of educational technologies should take into consideration contextual factors, and that there needs to be a stronger emphasis on CALL infrastructure, which refers to the environment where technology and pedagogy synthesise. This piece strengthens the relevance of Ecological Systems Theory to CALL research.	A, B
2010	van Lier, V. (2010). The ecology of language learning: Practice to theory, theory to practice. <i>Procedia - Social and Behavioral Sciences</i> , 3, 2–6. doi:10.1016/j.sbspro.2010.07.005	<b>van Lier</b> continues his discussion on an ecological perspective to language learning by defining an ecology as interactions among the physical, social, and semiotic elements in an educational setting. He then outlines the core attributes of an ecology of language learning: relationships among the physical, social, and symbolic; quality of educational experiences; and learners' agency. In addition to conceptualisation, van Lier concludes by recommending useful research methodologies with which to conduct ecological research, namely case study and action research underpinned by theories that take into consideration complexity of the language learning process (e.g., complexity theory, activity theory).	A

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Year	References	Annotations	Theme(s)
2011	Cao, Y. (2011). Investigating situational willingness to communicate within second language classrooms from an ecological perspective. <i>System</i> , 39(4), 468–479. doi:10.1016/j.system.2011.10.016	<b>Cao</b> draws on the line of work by VAN LIER (1997; 2010) to introduce the ecological focus of her study: learners' willingness to communicate (WTC). Similar to BERGLUND (2009), this study explores the interrelatedness between environmental and learner factors in contributing to learners' WTC in a L2 setting. Adopting a multiple case study approach focusing on six English learners, data were collected from interviews, lesson observations, and reflective journals. Findings suggest three interdependent dimensions that influence learners' WTC: environmental, individual, and linguistic dimensions. This piece contributes to a more comprehensive ecological thinking, highlighting interconnectedness between contexts and the people therein.	E
2012	Peng, J. (2012). Towards an ecological understanding of willingness to communicate in EFL classrooms in China. <i>System</i> , 40(2), 203–213. doi:10.1016/j.system.2012.02.002	<b>Peng</b> employs BRONFENBRENNER'S (1979) nested Ecological Systems Theory as the conceptual framework to analyse learner and environmental factors that influence the willingness to communicate of four Chinese English as a Foreign Language (EFL) university learners. Similar to CAO (2011), which focuses on learners' willingness to communicate, Peng expands on CAO'S (2011) environmental dimension to comprise micro-, meso-, exo-, and macro-ecosystems. Qualitative findings of this study call for a refined understanding of willingness to communicate as a sociocultural construct.	A, E
2012	Wiertlewska, J. (2012). Language planning and language policy in the ecological perspective. <i>Glottodidactica. An International Journal of Applied Linguistics</i> , 39(1), 117–126. doi:10.14746/gl.2012.39.1.11	Similar to Hu's (2005) attempt to apply an ecological lens to language policy research, <b>Wiertlewska</b> introduces the notion of ecological language planning and policy (LPP), which aims to sustain linguistic diversity by identifying favourable physical and cultural factors. In an ecological approach to LPP, diversity triumphs over standardisation by involving local communities. The author traces the development of LPP research from a historical perspective using an ecological lens, foregrounding efforts to ascertain linguistic diversity.	A, C
2013	Neal, J. W., & Neal, Z. P. (2013). Nested or networked? Future directions for ecological systems theory. <i>Social Development</i> , 22(4), 722–737. doi:10.1111/sode.12018	This article first reviews BRONFENBRENNER'S (1979) nested Ecological Systems Theory. In addition to the four ecological systems, <b>Neal &amp; Neal's</b> typology of ecologies underscores the temporal aspect of environments (chronosystem). Employing a social network model, the authors propose a networked version of Ecological Systems Theory that reconceptualises the notion of "setting" from a physical space where people interact to the people who interact. The networked Ecological Systems Theory enables ecological researchers to enrich their analysis to encompass not only descriptions of contextual features, but also the nature and patterns of human interactions within a specific context.	A

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Year	References	Annotations	Theme(s)
2016	Edwards, E., & Burns, A. (2016). Language teacher-researcher identity negotiation: An ecological perspective. <i>TESOL Quarterly</i> , 50(3), 735–745. doi:10.1002/tesq.313	<b>Edwards &amp; Burns</b> apply an ecological and sociocultural lens to a new area of L2 research: language teacher-researcher identity. Focusing on VAN LIER'S (1997) notion of affordances from an ecological perspective and social construction of self in Sociocultural Theory, the study examines how two language teacher-researchers' identities were negotiated through action research in their respective socio-political environments. Results shed light on micro and macro environmental constraints of conducting action research.	D
2017	Allard, E. C. (2017). Re-examining teacher translanguaging: An ecological perspective. <i>Bilingual Research Journal</i> , 40(2), 116–130. doi:10.1080/15235882.2017.1306597	Extending an ecological perspective to research on translanguaging and bilingualism, <b>Allard</b> conducts an ethnographic study on the translanguaging practice of two teachers. Informed by KRAMSCH (2008) and others, Allard considers the connections between translanguaging and various dimensions of educational milieus. Specifically, this study investigates the compatibility between the teachers' translanguaging practice and a specific ecosystem, the classroom/institutional contexts (microsystem). Findings reveal that the two teachers' translanguaging is restricted because of unfavourable school policies and classroom culture.	D
2017	Saghafi, K., Adel, S. M. R., & Zareian, G. (2017). An ecological study of foreign language writing anxiety in English as a Foreign Language classroom. <i>Journal of Intercultural Communication Research</i> , 46(5), 424–440. doi:10.1080/17475759.2017.1367954	This study focuses on EFL learners' writing anxiety. <b>Saghafi et al.</b> adopted BRONFENBRENNER'S (1979) nested Ecological Systems Theory as the theoretical framework with which to analyse sources of EFL learners' writing anxiety in terms of four dimensions of ecosystems: micro, meso, exo, and macro. This is one of the few studies that utilise BRONFENBRENNER'S (1979) model comprehensively. Microsystemic influences include EFL learners' beliefs, motivation, cognitive, linguistic, emotional factors, and classroom contextual factors. Mesosystemic forces at work relate to learners' past learning experience. The exosystematic dimension concerns curriculum design of the English language courses. Macrosystem concerns the impact of sociocultural factors on learners' writing anxiety.	E

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Year	References	Annotations	Theme(s)
2018	Liu, Q., & Chao, C.-C. (2018). CALL from an ecological perspective: How a teacher perceives affordance and fosters learner agency in a technology-mediated language classroom. <i>ReCALL</i> , 30(1), 68–87. doi:10.1017/S0958344017000222	This qualitative study examines environmental influences on a language teacher’s use of technological tools in developing learners’ agency. Pinpointing such ecological notions as affordance and interaction, the authors’ investigation centres on connections among affordances of technological tools, the teacher’s pedagogical knowledge, and her belief in cultivating L2 learners’ agency. The theoretical underpinnings of this study draw on works by ecological researchers such as VAN LIER (1997, 2010), and Vygotsky’s Sociocultural Theory. The uniqueness of this study lies in its single case study design, demonstrating further how Ecological Systems Theory can serve as a useful theoretical framework to inform in-depth qualitative research.	B
2019	Han, Y. (2019). Written corrective feedback from an ecological perspective: The interaction between the context and individual learners. <i>System</i> , 80, 288–303. doi:10.1016/j.system.2018.12.009	Han applies VAN LIER’S (1997, 2010) ecological perspective to language learning to researching L2 learners’ engagement with written corrective feedback. The study includes one teacher participant and two student participants in a Chinese university. Similar to LIU & CHAO (2018), this case study aims to identify the learner and contextual variables that affect learners’ engagement with written corrective feedback. A secondary objective of the study is to capture how learner and contextual factors interact to shape feedback engagement. This study is one of the first to put forward the notion of “alignment,” arguing that for engagement to take place, it is essential to establish alignment between learners’ needs and contextual affordances.	F
2019	Stelma, J., & Fay, R. (2019). An ecological perspective for critical action in applied linguistics. In A. Kostoulas (Ed.), <i>Challenging boundaries in language education</i> (pp. 51–69). Springer. doi:10.1007/978-3-030-17057-8_4	Taking a social justice stance, <b>Stelma &amp; Fay</b> discuss the notion of applied linguistics ecology. Highlighting key notions in ecological perspective such as mutuality and affordances, the authors offer an alternative view that universities in non-English speaking contexts should respond to the dominance of English as an international academic language through acknowledging and encouraging the development of goals of various stakeholders (e.g., international students) in the ecology. This novelty of this work rests in its emphasis on a less frequently discussed notion in the ecological model, “mutuality” (referring to the indispensable nature of two elements in an ecosystem), which is a critical take on the ecological perspective.	A

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Year	References	Annotations	Theme(s)
2020	Mercer, S. (2020). The wellbeing of language teachers in the private sector: An ecological perspective. <i>Language Teaching Research</i> , 1–24. Advanced online publication. doi:10.1177/1362168820973510	<b>Mercer</b> discusses how the wellbeing of eight ELT teachers in the private sector in Malta is positively and negatively affected by their work environments. Environments, or ecologies, identified through two rounds of interviews include the local ELT industry, the school, and the teacher participants' teaching experiences. This work is original owing to its application of an ecological perspective to language teacher psychology, marrying the psychological and ecological turns in L2 research (see also SAGHAFI ET AL., 2017).	<b>D</b>
2020	Niu, R. (2020). An ecological perspective on EFL learners' oral communication. In A. Jamshidnejad (Ed.), <i>Speaking English as a second language</i> (pp. 75–101). Springer International Publishing. doi:10.1007/978-3-030-55057-8_4	<b>Niu</b> employs VAN LIER'S (1997, 2010) ecological perspective and BRONFENBRENNER'S (1979) nested Ecological Systems Theory to investigate learner and environmental factors that affect a group of EFL learners' oral language learning. Focusing on two university EFL learners in China, data for this case study were collected from interviews and reflective journals. Results identify eight learner and contextual factors, corresponding to the four layers of ecosystem in BRONFENBRENNER'S (1979) model. Based on the findings, Niu introduces the notion of "ecological transition" (p. 96), which refers to change of learning environments as experienced by the learners.	<b>E</b>
2021	Chong, S. W. (2021). Reconsidering student feedback literacy from an ecological perspective. <i>Assessment &amp; Evaluation in Higher Education</i> , 46 (1), 92–104. doi:10.1080/02602938.2020.1730765	<b>Chong's</b> commentary enriches the conceptualisation of student feedback literacy using an ecological lens. He puts forward a student feedback literacy model consisting of three dimensions: engagement, context, and individual learner. Drawing on BRONFENBRENNER'S (1979) and NEAL & NEAL'S (2013) Ecological Systems Theory, the contextual dimension is divided into four layers: textual, instructional, interpersonal, and sociocultural. A unique contribution of this piece is the concept of the interplay between contextual and learner variables. Similar to HAN (2019), Chong argues that congruence between learners' attributes and environments is crucial for learner engagement in educational activities, in this case, engaging with feedback.	<b>A, F</b>

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Year	References	Annotations	Theme(s)
2021	Hofstadler, N., Babic, S., Lämmerer, A., Mercer, S., & Oberdorfer, P. (2021). The ecology of CLIL teachers in Austria – an ecological perspective on CLIL teachers’ wellbeing. <i>Innovation in Language Learning and Teaching</i> , 15(3), 218–232. doi:10.1080/17501229.2020.1739050	This study by <b>Hofstadler et al.</b> , in line with <b>MERCER (2020)</b> , focuses on the wellbeing of 16 Content and Language Integrated Learning (CLIL) teachers in Austria. The ecological lens of this study is informed by <b>BRONFENBRENNER’S (1979)</b> nested Ecological Systems Theory to look at sources of influence of the CLIL teachers’ wellbeing. Interview data suggest that four types of contexts affected the teachers’ wellbeing: personal, class, institutional, and national contexts. Instead of focusing on the interplay between contextual and learner variables as advocated in such recent publications as <b>HAN (2019)</b> , this study only examines contextual influences.	<b>D</b>
2021	Huang, E., Jiang, L., & Yang, M. (2021). The affordances of a technology-aided formative assessment platform for the assessment and teaching of English as a foreign language: An ecological perspective. <i>Educational Technology Research and Development</i> , 69, 3391–3412. doi:10.1007/s11423-021-10047-y	<b>Huang et al.’s</b> ecological framework is eclectic, drawing on Ecological Systems Theory, Complex Dynamic Systems Theory, and Activity Theory. Focusing on the notion of “affordance” from an ecological perspective, Huang et al. identify five types of affordances of formative assessment practices on a learning management system used by five Chinese EFL teachers: pedagogical, managerial, assessment, social, and developmental. This is one of the few entries that synergises similarities among the three theoretical constructs; at the same time, it underscores the unique attribute of Ecological Systems Theory – its emphasis on contextual affordances.	<b>B, F</b>
2021	Mercer, S. (2021). An agenda for well-being in ELT: An ecological perspective. <i>ELT Journal</i> , 75(1), 14–21. doi:10.1093/elt/ccaa062	<b>Mercer</b> puts forward a case for making wellbeing a core business in ELT. She defines “wellbeing” as the outcome of one’s capacity to identify affordances in their social and professional environments and grounds her arguments using an ecological lens. She posits that any interventions aiming to improve ELT teachers’ wellbeing should consider both teachers’ needs and changes in the educational system. This study is a fine example of applying an ecological frame to reconceptualise an emerging L2 notion.	<b>D</b>
2021	Schwartz, M., & Deeb, I. (2021). Toward a better understanding of the language conducive context: An ecological perspective on children’s progress in the second language in bilingual preschool. <i>International Journal of Bilingual Education and Bilingualism</i> , 24(4), 481–499. doi:10.1080/13670050.2018.1484424	Focusing on six three-year-old L2 learners, <b>Schwartz &amp; Deeb’s</b> study examines favourable factors that lead to productive use of L2 in a bilingual speaking preschool classroom in Israel. This is one of the first studies that applies an ecological perspective to researching young L2 learners. The ecological component of this study is based on <b>VAN LIER’S (1997, 2010)</b> ecological perspective of language learning, focusing on micro- and macro-context where L2 learning takes place. The results suggest that children-led, play-based classroom activities are conducive to young learners’ use of L2.	<b>E</b>

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Year	References	Annotations	Theme(s)
2021	Shen, Q., Wang, L., & Gao, X. (Andy). (2021). An ecological approach to family language policy research: The case of Miao families in China. <i>Current Issues in Language Planning</i> , 22(4), 427–445. doi:10.1080/14664208.2020.1764730	The focus of this mixed methods study is on family language policy and practice of the Miao language in China. Adopting an ecological framework closely resembling BRONFENBRENNER'S (1979) nested model, <b>Shen et al.</b> investigate the mediating factors influencing family language policy. Results suggest that inconsistencies between factors at various levels of the ecosystem of family language policy led to the decline in the use of the Miao language. This focus on mismatch (in lieu of alignments) among various ecosystems is also discussed in other entries (e.g., CHONG, 2021; HAN, 2019).	C
2021	Shirvan, M. E., Lou, N. M., & Taherian, T. (2021). Where do language mindsets come from? An ecological perspective on EFL students' mindsets About L2 writing. <i>Journal of Psycholinguistic Research</i> , 50(5), 1065–1086. doi:10.1007/s10936-021-09787-y	Informed by works by VAN LIER (1997, 2010), BRONFENBRENNER (1979), and others, <b>Shiravn et al.</b> present an ecological conceptual framework comprising five nested ecosystems: micro-, meso-, exo-, macro-, and chrono-. Grounded on an ecological viewpoint, interviews of six adult EFL learners reveal myriad contextual factors that cultivate the learners' mindset towards L2 writing. Findings unravel factors ranging from individual learners' traits to sociocultural ones, which shape the development of L2 writers' mindset. This study, together with MERCER (2021) that focuses on ELT teacher wellbeing, demonstrates the usefulness of employing an ecological perspective to reconceptualise new L2 notions. In this case, the focal concept, L2 mindset, is reconceptualised as an emergent, complex, and dynamic construct.	F
2021	Solmaz, O. (2021). The affordances of digital social reading for EFL learners: An ecological perspective. <i>International Journal of Mobile and Blended Learning</i> , 13(2), 36–50. doi:10.4018/IJMBL.2021040103	Similar to previous entries – such as HUANG ET AL. (2021), LIU & CHAO (2018), EDWARDS & BURNS (2016), and BERGLUND (2009) – <b>Solmaz</b> focuses on affordances of an educational intervention in an EFL university. Like some earlier entries in the timeline, Solmaz defines “affordances” as learners' perceived benefits of a pedagogical intervention. In the context of an online collaborative reading tool, the researcher discusses linguistic and social affordances of this technology-mediated reading practice for improving learners' writing skills and grammar. The study is an insightful reference to conducting ecologically-informed L2 research, underscoring the usefulness of collecting both perceptual and observational data when analysing ecologies of learning.	B

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Year	References	Annotations	Theme(s)
2021	Song, Y., & Ma, Q. (2021). Affordances of a mobile learner-generated tool for pupils' English as a second language vocabulary learning: An ecological perspective. <i>British Journal of Educational Technology</i> , 52(2), 858–878. doi:10.1111/bjet.13037	Focusing on affordances (see also other entries that focus on affordances, e.g., BERGLUND, 2009, EDWARDS & BURNS, 2016; SOLMAZ, 2021) from an ecological perspective, <b>Song &amp; Ma</b> investigate the vocabulary learning experiences of 23 Grade 4 English L2 learners in Hong Kong using a mobile learner-generated content application. The innovation of this study lies in its proposition of an ecological mobile vocabulary learning framework that highlights the interconnectedness between mobile vocabulary learning environment and young language learners. Affordances identified include opportunities created by the mobile platform to increase learner agency and opportunities for learners to engage in collaborative learning.	<b>B</b>
2021	Tsang, S. C. S. (2021). An exploratory study of Chinese-as-an-additional-language teachers' agency in post-1997 Hong Kong: An ecological perspective. <i>Current Issues in Language Planning</i> , 22 (1–2), 19–40. doi:10.1080/14664208.2020.1725331	Focusing on Chinese as an additional language policy in Hong Kong, <b>Tsang</b> conducts interviews with ten Chinese-as-an-additional-language secondary school teachers to identify contextual features that promote and constrain teacher agency. The uniqueness of this study vis-à-vis an ecological perspective is its explicit focus on the temporal aspect of contexts, highlighting Chinese language policy changes before and after the 1997 handover of Hong Kong to China. Findings suggest that there is a constant interplay between language policy and Chinese-as-an-additional-language teachers who are “micro-level language planners” (p. 36).	<b>D</b>

<sup>1</sup>Author names are shown in small capitals where the study referred to appears elsewhere in this timeline.

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