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RESEARCH TIMELINE

Informal second language learning

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1. Introduction

Second language acquisition (SLA) research has historically prioritized classroom-based contexts, with the exception of areas such as study abroad, incidental and self-directed learning. In the last decades, however, research interest in second language (L2) learning beyond the classroom has grown substantially, expanding our understanding of where and how L2 learning takes place. This can be largely attributed to advancements in mobile and digital technologies which, through rapidly expanding access to online content, have opened up new possibilities for authentic L2 consumption, production, and interaction. Researchers coined various terms to describe these new avenues of online language use, including *online informal learning of English* (OILE; Toffoli & Sockett, 2010*[1]), *informal digital learning of English* (IDLE; Lee & Dressman, 2018*), *out-of-class language learning with technology* (Lai & Gu, 2011*), or *language learning in the digital wilds* (Sauro & Zourou, 2019). In parallel, other researchers began to investigate *extramural English* (EE; Sundqvist, 2009*) and *language learning and teaching beyond the classroom* (LLTBC or simply LBC; Reinders & Benson, 2017*; Reinders et al., 2022a), with similar overall research objectives but a broader focus that includes both digital and "real-world" practices. Since then, the number of publications on language learning beyond the classroom has increased exponentially, with particularly rapid growth since 2017 (Kusyk et al., 2025*). From this body of literature, the beginning contours of what we will refer to as *informal second language learning* (ISLL; Arndt, 2019) as a distinctive area of interest within SLA research have emerged. Different varieties of learning outside the classroom both overlap and differ considerably in their definitions. They can be distinguished by four primary aspects (see Fig. 1), referring to the inclusion of non-formal activities in addition to informal activities; activities that are teacher-initiated or link to the formal language classroom in addition to learner-initiated and -direct activities; "real-world" activities in addition to digital or technology-mediated activities; and other target languages in addition to English. Figure 1 presents an overview of how the most frequently cited terms differ in regard to these aspects, based on our interpretation of the definitions provided in the literature. LLTBC being the most inclusive term (Reinders et al., 2022a), we consider it an umbrella under which the other terms can be subsumed.

In this timeline we focus on the particular strand of ISLL, which we define as follows:

- ***Informal*** refers to autonomous, self-initiated participation in L2 activities beyond the classroom, both on- and offline, which are unconnected to language courses or other forms of formalized learning and teaching (e.g., private tutoring). In this sense, we exclude non-formal

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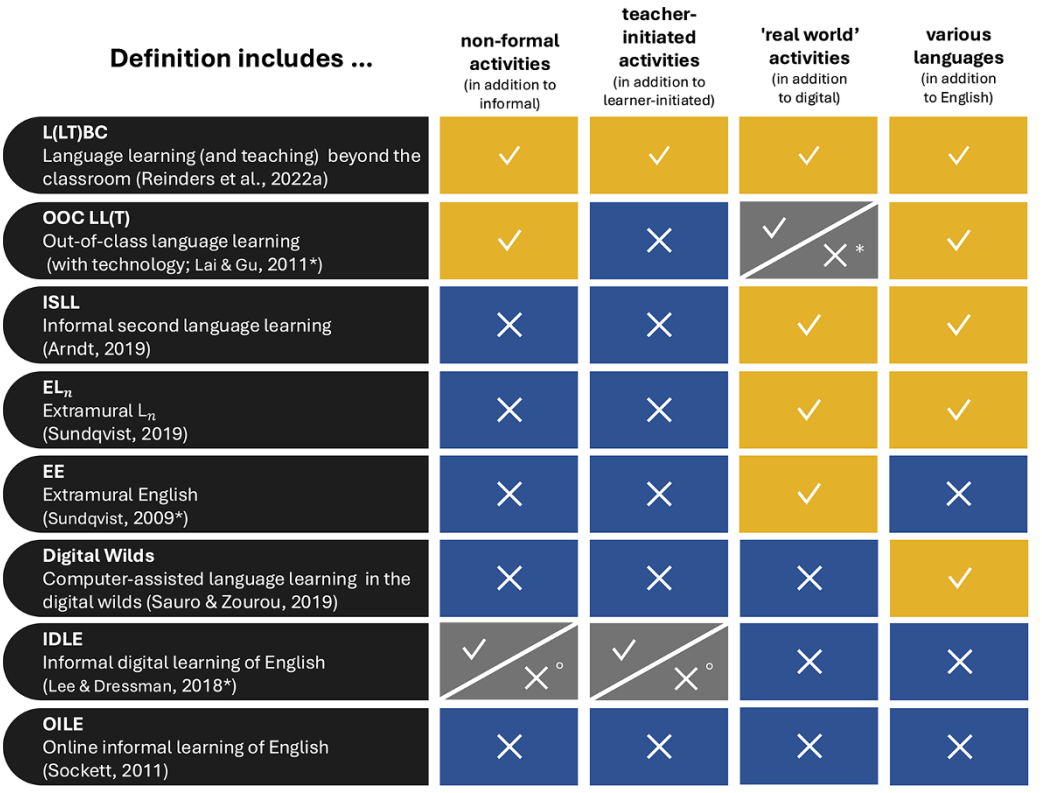


Figure 1. Language learning and teaching beyond the classroom: Terms and definitions.
**Some later publications included activities not mediated by technology (e.g.,* Lai, 2015*).*
°While Lee (2019b) *distinguished between IDLE in extracurricular vs. extramural contexts, the former retaining a link to formal and non-formal language education, a later publication defines IDLE as "a fully autonomous L2 activity in out-of-class digital environments that is not linked to formal language instruction" (*Lee, 2020**, p. 52).*

learning (programs and resources designed for learning outside of educational institutions, e.g., online language learning communities or language learning apps; Schugurensky, 2007) because it may involve different learning processes and levels of motivation than informal learning.

- ***Second language*** is used symbolically, as in *second language acquisition*, to refer to all additional languages (L2, L3, etc., or L_n) learned both in traditional second language and foreign language contexts. The term also indicates a consideration of many possible target languages, as opposed to focusing just on English.
- Finally, ***learning*** here refers to language development in all forms (acquisition, learning, progression, regression, etc.), also taking into consideration psychological variables connected to the learning process such as motivation, grit, willingness to communicate, etc. Learning may take place intentionally, though it is often incidental, emerging from participation in meaning-focused activities.

The timeline is intended to help readers familiarize themselves with the topic of ISLL, as defined above, through presenting a selection of research papers, theoretical discussions, reviews, etc. that includes influential, widely cited works that have shaped this research area, articles representing a cross-section of the topics that the field has grappled with in this time, and those that signify important milestones or conceptual developments in ISLL research. We also include some publications that underscore the evolution of pedagogical practices as a result of the growing importance of ISLL (e.g., Lai, 2019*; Richards, 2015*; Thorne & Hellerman, 2022*). Though concerned with the classroom,

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rather than informal settings, these publications emphasize the importance of learner autonomy, learner choice, and bidirectional learning across the formal–informal interface.

To be sure, SLA researchers have been interested in language learning beyond the classroom long before the recent surge of ISLL-related publications: consider Bialystok (1981) underlining the importance of functional practice through language exposure in promoting L2 competence; discussions on autonomy and the importance of learning beyond the classroom (Benson, 2001; Hyland, 2004); and studies on face-to-face interactions (Brouwer, 2003; Spada, 1986) and language learners' use of traditional media (Murphy, 2005; Pickard, 1996). *Learning through leisure* has also been investigated extensively in the context of television viewing, especially in Europe where countries employ different broadcasting modalities such as subtitling, captions, and dubbing (e.g., European Commission, 2011; Koolstra & Beentjes, 1999; Vanderplank, 1988). In the early 2000s, the field of new literacies explored questions of digital L2 literacy and identity construction through participation in chat rooms and online communities (e.g., Black, 2006; Lam, 2000). Around the same time, broader investigations of out-of-class L2 exposure and use with various technologies began to emerge, which we take as the point of departure for this timeline (e.g., Alabau et al., 2002*; Lamb, 2004). While echoing themes and insights from earlier scholarship, these more recent studies generally aim to investigate informal language learning in a more holistic manner, transcending individual technologies to paint a comprehensive picture of learners' language exposure and use outside the classroom and, in some cases, relate it to different aspects of language development and individual learner differences.

In addition to recognizing that ISLL research is rooted in studies dating back far beyond the beginning of this timeline, it is also important to distinguish between the foci of ISLL research and certain "ISLL-adjacent" areas of inquiry. Firstly, we have observed a considerable amount of overlap with *computer- and mobile-assisted language learning* (CALL/MALL), with some ISLL studies even situating themselves within the greater CALL/MALL landscape (e.g., Benson & Chik, 2011; Lee, 2019a). This overlap could sow some confusion, with the strong tendency of CALL/MALL studies to focus on the use of mobile learning applications in the classroom, or in teacher-led non-formal contexts, as well as on the devices themselves (Burston, 2014; Chwo et al., 2016). Though there is certainly utility in examining ISLL as a possible complement to classroom pedagogy (see, e.g., Lee & Sylvén, 2021*; Richards, 2015*; Thorne & Hellermann, 2022* on the interface between informal and formal learning), in keeping with our definition of ISLL above, we have excluded publications from our timeline which would be better situated within CALL/MALL because they focus primarily on digital practices connected to classroom or teacher-led activities. We also exclude studies on L2 learning in study abroad and migration. While the potential for learning through informal language exposure and use certainly exists in these contexts, we feel that they are firmly rooted within SLA as distinct areas of inquiry with their own historical development and bodies of literature. Finally, while the timeline is limited to journal articles and book chapters, interested readers should not overlook relevant monographs and edited volumes, such as Benson and Reinders (2011), Nunan and Richards (2015), Sockett (2014), Sundqvist and Sylvén (2016), Dressman and Sadler (2020), plus additional collections mentioned in the timeline.

Despite being a relatively new area of inquiry within SLA, a clear evolution in research interests, objectives, and methodologies can be observed in recent ISLL studies. We have previously proposed that these changes can be grouped into three major waves (Kusyk et al., 2025*), which is clearly reflected in the timeline: Research published in the early 2010s primarily centered on the discovery and description of ISLL, using questionnaires to inventory learners' informal habits, their frequency, and perceptions of informal L2 use (e.g., Lai & Gu, 2011*; Sundqvist, 2009*, Toffoli & Sockett, 2010*). In the second wave, the focus shifted toward the relationships between informal L2 practices and language learning, with findings overwhelmingly pointing toward positive associations (e.g., Cole & Vanderplank, 2016*; De Wilde et al., 2020*; Peters, 2018*). This is often interpreted as evidence that informal L2 exposure and use benefit language learning, although the heavy reliance on correlational methods means that the proposed causal relationship requires further investigation (e.g.,

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in longitudinal studies, see Bengtsson, 2023*; Kusyk, 2017). Research in the most recent third wave shifted toward exploring ISLL in relation to numerous individual difference (ID) variables and the nature of specific informal activities themselves, in order to determine for whom and under which conditions ISLL can be most effective (e.g., Arndt, 2023; Lai, 2015; Lee & Hsieh, 2019*). Since the "first wave," studies have also increasingly incorporated more complex methods and forms of analysis, such as multilevel linear regression, structural equation modelling, and latent profile analysis (e.g., Arndt, 2019; Lee, 2020*; Liu & Ma, 2024*).

We see the evolution of research themes and methods, including a push for standardized instruments developed specifically for research in informal contexts (Arndt, 2023*; Sockett et al., 2023; Sundqvist & Uztosun, 2024*), as a sign that ISLL research as a whole is growing and maturing. The publication of several systematic and scoping reviews (e.g., Kusyk et al., 2025*; Zhang et al., 2021*) and comparative studies (e.g., Muñoz & Cadierno, 2021*; Sundqvist & Uztosun, 2024*) would lend support to this suggestion. Finally, recent papers on new technologies (e.g., generative artificial intelligence: Liu & Ma, 2024*) and languages other than English (e.g., Japanese: Bengtsson, 2023*) illustrate the direction in which the literature is currently developing.

In summary, this timeline is intended to chronicle the recent historical development of research within informal second language learning, highlighting key contributions and significant findings along the way. We categorize the publications according to the following themes that emerged through our systematic readings and observations of the literature:

A. Publication focus

1. Research review
2. The formal–informal interface
3. Theorizing ISLL
4. Research methods

B. Research focus

1. Describing/inventorying informal practices
2. Learner/teacher perceptions
3. Correlations between informal practices and proficiency/ID variables
4. Group comparisons
5. Case studies
6. Learners prior to instruction
7. Longitudinal investigations

C. Aspects of informal practices

1. Frequency (how often)
2. Duration (time spent)
3. Diversity
4. Quality (nature of engagement with these resources)

D. Aspects of language proficiency

1. General proficiency
2. Vocabulary
3. Grammar
4. Reading
5. Writing

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6. Listening
7. Speaking

E. Individual differences

1. Gender
2. Self-efficacy, confidence, grit
3. Emotions: Anxiety, enjoyment
4. Motivation, attitudes, willingness to communicate

References	Annotations	Themes
Alabau, I., Bonnet, G., de Bot, K., Bramsbye, J., Dauphin, L., Erickson, G., Etelälahti, A., Evers, R., Hesse, H.-G., Ibsen, E., Kühnbach, O., Lagergren, T., Levasseur, J., Nielsen, K. L., de Quay, P., Tuokko, E., & Vrignaud, P. (2002). *The assessment of pupils' skills in English in eight European countries.* The European network of policy makers for the evaluation of education systems.	**Alabau et al.'s** large-scale comparative study showed stark differences in English skills between European countries. Though no inferential analyses were conducted, the data suggested differences between countries that subtitle television programs and movies (in general, higher test scores) and countries that dub such content (in general, lower test scores). Secondary school students in the subtitling countries also reported significant exposure to English outside the classroom (not reported for dubbing countries), suggesting that the media landscape may play an important role in skill acquisition. Contemporary research continues to emphasize differences between subtitling and dubbing countries (e.g., KUPPENS[2], 2010; MUÑOZ & CADIERNO, 2021; Schurz & Sundqvist, 2022).	B4, C1, D1, D4, D5, D7
Sundqvist, P. (2009). *Extramural English matters: Out-of-school English and its impact on Swedish ninth graders' oral proficiency and vocabulary* [PhD thesis]. Karlstad University. https://urn.kb.se/resolve?urn=urn:nbn:se:kau:diva-4880	**Sundqvist**'s Ph.D. dissertation study established her as a forerunner in EE research. Structured diaries were used to measure the quantity (duration) of EE contact among 80 Swedish secondary school students. This correlated significantly and positively with performance on speaking and vocabulary tests and self-efficacy in English but not speaking-related anxiety. Although receptive activities were more common among the surveyed learners, productive language use better predicted both oral and lexical proficiency and was more common among boys in this study. Despite employing only correlational methods, Sundqvist interpreted her results as an indication that EE benefits L2 acquisition (rather than more proficient students engaging more extensively in EE) and suggested that teachers should motivate all students to engage particularly in productive EE activities.	B1, B3, C1, C2, D2, D7, E1, E2, E3
Thorne, S. L., Black, R. W., & Sykes, J. M. (2009). Second language use, socialization, and learning in internet interest communities and online gaming. *Modern Language Journal*, 93, 802–821. https://doi.org/10.1111/j.1540-4781.2009.00974.x	This is a summary of and reflection on mostly ethnographic *new literacy studies* in the early 2000s (e.g., Black, 2006; Lam, 2000; 2004), which illustrated what later ISLL research demonstrated at a broader scale: the potential linguistic, affective, and motivational benefits of participating in online L2 environments closely tied to personal interests. **Thorne et al.** pointed toward the need for researchers to discuss what models of language development best apply in informal learning contexts, and how interest-driven participation in L2 activities can be integrated with instructed practices. Both topics, the theorization of ISLL and the pedagogical interface, remain widely discussed today (e.g., THORNE & HELLERMAN, 2022; WAGNER, 2015).	A1, A2, A3, B1, B2

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References	Annotations	Themes
Kuppens, A. H. (2010). Incidental foreign language acquisition from media exposure. *Learning, Media and Technology, 35*(1), 65–85. https://doi.org/10.1080/17439880903561876	In this study with 361 Flemish pupils aged 10–12 with no prior formal instruction in English, **Kuppens** found that the frequency of watching TV programs/movies and playing video games in English correlated positively with performance on an oral bilingual translation test. This effect was stronger for girls than boys, and the participants achieved higher average scores in the English translation tests than in equivalent tests in French (their first L2, after several years of formal language instruction). Therefore, this study demonstrated not only the influence of the omnipresence of English in popular culture but provided early evidence in favor of a causal relationship between informal English-language contact and proficiency (see also DE WILDE, BRYSBAERT & EYCKMANS, 2020; SYLVÉN, 2022; SYLVÉN & SUNDQVIST, 2012).	B3, B4, B6, C1, D2, E1
Toffoli, D., & Sockett, G. (2010). How non-specialist students of English practice informal learning using web 2.0 tools. *ASp, 58*, 125–144. https://doi.org/10.4000/asp.1851	The paper reports on an influential "first wave" ISLL study (see KUSYK et al., 2025) focused on inventorying the most popular informal L2 practices among a specific learner population, which is typically the first research to be conducted when ISLL becomes a topic of interest in a new region/context. The researchers surveyed how frequently 222 French university students participated in different OILE activities. More than 95% reported engaging in such activities "regularly" (at least once per month). Like SUNDQVIST (2009), **Toffoli and Sockett** found that receptive activities were more common, with listening to music, watching films, and TV series being most popular. The findings were largely replicated by Sockett (2014), except that TV series had further risen in popularity.	B1, C1
Benson, P. (2011). Language learning and teaching beyond the classroom: An introduction to the field. In P. Benson & H. Reinders (Eds.), *Beyond the language classroom* (pp. 7–16). Palgrave Macmillan. https://doi.org/10.1057/9780230306790_2	In this introduction to the first significant collection of research on LLTBC, which played a crucial role in drawing attention toward this research area, **Benson** proposed a seminal framework for delineating formal, non-formal, and informal varieties of learning using the four dimensions location, formality, pedagogy, and locus of control (further additions discussed in BENSON & REINDERS, 2017). The framework is frequently cited in researchers' definitions of informal learning (e.g., Arndt, 2019; LAI, ZHU & GONG, 2015; Schwarz, 2020).	A2, A3
Lai, C. & Gu, M. (2011): Self-regulated out-of-class language learning with technology. *Computer Assisted Language Learning, 24*(4), 317-335. https://doi.org/10.1080/09588221.2011.568417	Adopting self-regulated learning (e.g., Zimmerman, 2000) as a theoretical framework, **Lai and Gu** surveyed 279 Hong Kong university students' use of technology for language learning outside the classroom. Exploratory factor analysis was used to examine how and why students used technology to regulate their language learning. In contrast to earlier studies from the European context (TOFFOLI & SOCKETT, 2010; SUNDQVIST, 2009), learners from Lai & Gu's sample emphasized using technology primarily for self-initiated learning as opposed to leisure (though this may have been due to differing proficiency levels, as more than half of the participants were beginners). To further enhance students' use of technology for self-regulated learning, the authors argue that teachers should not only provide encouragement but also help students to identify resources at an appropriate level of difficulty and introduce tools and strategies to help mitigate challenges and maximize language learning outcomes.	B1, B2, C2, C4

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References	Annotations	Themes
Kusyk, M. & Sockett, G. (2012). From informal resource usage to incidental language acquisition: language uptake from online television viewing in English. *ASp, 62*, 45-65. https://journals.openedition.org/asp/3104	Following SUNDQVIST (2009) and KUPPENS (2010), this study was among the first to investigate L2 proficiency in association with informal L2 activities. Here, the focus was exclusively on online television viewing. Using an adapted vocabulary knowledge scale, **Kusyk and Sockett** measured 45 French university-level English learners' listening comprehension of the most frequent four-word chunks from Sockett's (2011) corpus of popular American television series. Vocabulary Knowledge Scores (VKS) were significantly higher for "frequent" (more than once per week) than "occasional" viewers (between once per week and once per month). Results were interpreted within a complex dynamic systems theory (CDST; CHAN et al., 2016; Godwin-Jones, 2018; KUSYK, 2017; Sockett & Toffoli, 2012) and incidental acquisition framework (KUPPENS, 2010; KUSYK, 2017; Lee 2019a).	A3, B3, C1, D2
Sylvén, L. K., & Sundqvist, P. (2012). Gaming as extramural English L2 learning and L2 proficiency among young learners. *ReCALL, 24*(3), 302–321. https://doi.org/10.1017/S095834401200016X	Similar to KUPPENS (2010), this study focused on younger learners (86, aged 11–12) but in a Swedish context. **Sylvén and Sundqvist** used questionnaires, diaries, and proficiency tests (reading and listening comprehension, vocabulary) to study English-language video gaming among these learners. Mirroring SUNDQVIST's (2009) findings, time spent gaming correlated positively with vocabulary knowledge and L2 comprehension, with some gender differences: boys had higher vocabulary scores, gamed 4.4 hours more per week, and played different types of games compared to girls. Video gaming was the most popular EE activity for this sample, followed by TV, music, films, and internet. Interestingly, the frequent gamers had the highest scores in both Swedish and English reading comprehension, despite gaming frequency negatively correlating with the frequency of reading books in Swedish. This provides evidence against the doubts raised by THORNE et al., 2009 regarding the transferability of language skills acquired from gaming.	B3, B6, C2, C3, D2, D4, D6, E1
Lai, C., Zhu, W., & Gong, G. (2015). Understanding the quality of out-of-class English learning. *TESOL Quarterly*, 49(2), 278–308. https://doi.org/10.1002/tesq.171	In an analysis of survey data from 82 Chinese middle school students, the variety of OOC English language activities positively correlated with confidence and enjoyment related to learning English, as well as subject grades. The quantity of OOC activities was not significantly related to these factors, which stands in contrast to earlier studies (KUPPENS, 2010; SUNDQVIST, 2009; KUSYK & SOCKETT, 2012; but see Lee, 2019b). Drawing on complementary participant interviews, **Lai et al.** argued that especially meaning-focused OOC activities provide an important complement to the heavily form-focused and teacher-led classroom experiences of learners in China. The interviews also revealed that less proficient students tended to use OOC activities in a form-focused way (focusing on grammar and rote learning), suggesting the possible presence of a "negative transfer effect." It should be noted that while Lai et al.'s definition of OOC English activities is broader than the definition of ISLL in the current paper (including non-formal options such as practice with grammar books and private tutoring), the importance of meaning-focused activities emerging from these findings directly speaks to their relevance to this timeline.	B3, C2, C3, C4, D1, E2, E3

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References	Annotations	Themes
Richards, J. C. (2015). The changing face of language learning: Learning beyond the classroom. *RELC Journal, 46*(1), 5-22. https://doi.org/10.1177/0033688214561621	Questions about the changing role of the teacher and the classroom have arisen in parallel with growing ISLL research interest (see also Lai, 2015; THORNE et al., 2009; WAGNER, 2015). Referring primarily to learning English as a foreign language (EFL), **Richards** postulated that LLTBC now "provide[s] greater opportunities for meaningful and authentic language use than are available in the classroom" (p. 2). This paper largely consisted of an inventory of LLTBC affordances (e.g., developing learners' communicative skills and different aspects of L2 proficiency), accompanied by discussions of individual resources and their implications. It thus functions as a potential guide for teachers looking to support students' L2 learning beyond the classroom and/or integrate LLTBC activities into classroom learning (see also de Bot, 2007).	A2
Wagner, J. (2015). *Designing for language learning in the wild: Creating social infrastructures for second language learning.* In T. Cadierno & S. W. Eskildsen (Eds.), *Usage-based perspectives on second language learning* (pp. 75–103). De Gruyter Mouton. https://doi.org/10.1515/9783110378528-006	The paper contains an early use of "in the wild" to refer to informal L2 practices, a term which was more widely popularized through the 2019 *Language Learning & Technology* special issue entitled *CALL in the Digital Wilds* (see HANNIBAL JENSEN, 2019; Sauro & Zourou, 2019). Drawing on sociocultural and usage-based theories of SLA, **Wagner** discussed how classroom practices can relate to, and be enhanced by, a consideration of learners' everyday L2 experiences. He reflected on various strategies for creating a "reflexive relationship" between formal and informal learning, such as designing tasks and infrastructure to encourage and support informal practices and, in turn, drawing on everyday activities as resources for reflection to strengthen and develop classroom learning (see Thorne & Reinhardt, 2008 on *bridging activities*; THORNE et al., 2009; RICHARDS, 2015). Later, Schwarz (2020) advocated for a similar "EE sensitive" approach, adapting formal instruction to better meet the needs of informal L2 users (e.g., in connecting with and building on knowledge acquired outside the classroom) and supporting more frequent and varied encounters with the informal sphere.	A2, A3
Chan, H., Lowie, W., & de Bot, K. (2016). Input outside the classroom and vocabulary development: A dynamic perspective. In M. Reif, & J. A. Robinson (Eds.), *Cognitive perspectives on bilingualism* (pp. 183–204). De Gruyter. https://doi.org/10.1515/9781614514190-010	In one of very few longitudinal ISLL studies (see also BENGTSSON, 2023; KUSYK, 2017), **Chan et al.** tracked the vocabulary development (lexical sophistication) of four Taiwanese learners of English over 5 months, which they described mathematically using a population logistic model. Situated within CDST, this study focused on the *process* of learning, rather than the product. Watching movies and reading constituted most of the learners' informal contact, which was not entirely learner-initiated due to the experimental nature of the study, but varied considerably across individuals and time. Overall, lexical sophistication increased by approximately 500 words during the study, with intermittent periods of decrease for one participant, which the researchers attribute to decreased exposure. The logistic model did not fit this participant's highly variable development well, suggesting that variables such as quality and quantity of input should also be considered. Like KUSYK (2017), this study highlights the nonlinear, fluctuating nature of learning that is often absent from product-focused study designs.	A3, B5, C2, D2

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References	Annotations	Themes
Cole, J., & Vanderplank, R. (2016). Comparing autonomous and class-based learners in Brazil: Evidence for the present-day advantages of informal, out-of-class learning. *System, 61*, 31–42. https://doi.org/10.1016/j.system.2016.07.007	Through purposive sampling, this quasi-experimental study directly compared language proficiency and motivation of primarily classroom-trained and predominantly informal adult English learners in Brazil. The informal learners had significantly higher language proficiency as measured in six language tests (with a strong focus on grammar skills, a rarity in ISLL research). **Cole and Vanderplank** interpreted this as evidence that informal learning "might produce better outcomes for learners than … traditional classroom-based environments" (p. 32). Since the group differences could not be explained fully by the quantity of ISLL, the authors argue that there is a qualitative, rather than categorical, difference in how "autonomous" and "class-based" learners engage in informal learning, in other words, that the difference is not in the extent to which these groups engage in informal activities, but *how* they do it (see also ARNDT, 2023; LAI et al., 2015).	B3, B4, C2, D2, D3, D4, E4
Kusyk, M. (2017). The development of complexity, accuracy and fluency in L2 written production through informal participation in online activities. *CALICO Journal, 34*(1), 75–96. https://doi.org/10.1558/cj.29513	In a *CALICO Journal* special issue (Sylvén & Sunqvist, 2017), this mixed-method, two-part study offers new insights on previous inventories of informal L2 usage (SUNDQVIST, 2009; TOFFOLI & SOCKETT, 2010) based on questionnaire data from 953 French and German university students. **Kusyk** also conducted longitudinal case studies, tracking the written language development of three learners over 5 months. This was the first ISLL study to employ complexity, accuracy and fluency measures to investigate language development within a CDST framework (see CHAN et al., 2016; Godwin-Jones, 2018; KUSYK & SOCKETT, 2012; Sockett & Toffoli, 2012), highlighting patterns of variation and nonlinearity. Full results, including data on oral production and lexical chunks, are reported in Kusyk's (2017) Ph.D. dissertation.	B1, B3, B5, B7, C2, D5
Reinders, H., & Benson, P. (2017). Research agenda: Language learning beyond the classroom. *Language Teaching, 50*(4), 561–578. https://doi.org/10.1017/S0261444817000192	Reflecting on the growth of LLTBC research, **Reinders and Benson** discussed the need to expand BENSON'S (2011) initial framework to include dimensions such as sociality, modality, language skills, and the learning processes (i.e., intentional, incidental, explicit, implicit). They did not present an updated model here but outlined key issues and research tasks intended to help advance LLTBC research, namely, the *settings* in which LBC takes place, how learners *experience/learn from* it, and the role that *teachers* should play. Reinders and Benson emphasized that LLTBC does not exclude the classroom, but rather connects with it, thus distinguishing LLTBC from other strands of ISLL research that exclusively focus on L2 exposure that is self-initiated and self-directed, without direct links to the classroom (see Section 1).	A2, A3

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References	Annotations	Themes
Lee, J. S., & Dressman, M. (2018). When IDLE hands make an English workshop: Informal digital learning of English and language proficiency. *TESOL Quarterly*, 52(2), 435–445. https://doi.org/10.1002/tesq.422	This is one of several publications based on Lee's (2018) Ph.D. dissertation study of informal practices among 94 university English learners in South Korea. The paper introduced IDLE, highlighted the importance of considering aspects beyond the duration/frequency of informal exposure (see ARNDT, 2023; LAI et al., 2015), and was seminal in establishing East Asia as one of the "hot-spots" of research on informal learning (KUSYK et al., 2025). Similar to LAI, et al. (2015), **Lee and Dressman** found that the variety of informal activities correlated positively with language proficiency (productive vocabulary size and performance on a speaking test), as well as willingness to communicate online. Lee (2019b) additionally reported that, in this same sample, the quantity of IDLE exposure was not significantly related to proficiency, unlike in prior studies from the European context (e.g., SUNDQVIST, 2009; KUPPENS, 2010; PETERS, 2018; KUSYK & SOCKETT, 2012). Lee (2018) postulated that this could signify that informal practices play a different role in East Asian language learning cultures (see LAI et al., 2015; LEE & SYLVÉN, 2021).	B1, B3, B5, C3, D1, D2, D7, E4
Peters, E. (2018). The effect of out-of-class exposure to English language media on learners' vocabulary knowledge. *International Journal of Applied Linguistics*, 169(1). 142–168. https://doi.org/10.1075/itl.00010.pet	This paper presents an investigation of OOC English-language media consumption among 79 Flemish secondary school/university students. **Peters** studied the relationships between vocabulary knowledge and length of instruction, gender, and current levels of OOC exposure reported in self-report questionnaires. Boys/men played computer games significantly more often than girls/women, but this did not correlate significantly with vocabulary knowledge (in contrast to studies with younger learners such as SYLVÉN & SUNDQVIST, 2012; DE WILDE et al., 2020). As in KUPPENS (2010), there was no significant difference in vocabulary knowledge between genders. Positive correlations were found between vocabulary and (in order of effect size) using the internet, watching non-subtitled television and movies, and reading magazines and books. Both length of classroom instruction and frequency of OOC exposure had a positive effect on vocabulary but, importantly, OOC contact explained a larger part of the variance in vocabulary scores (13% vs. 7%).	B3, C1, D2
Hannibal Jensen, S. (2019). Language learning in the wild: A young user perspective. *Language Learning & Technology*, 23(1), 72–86. https://doi.org/10125/44673	This publication reports on an ethnographic observation study of 7- to 11-year-old Danish children who frequently took part in what **Hannibal Jensen** (2017) described as "gender-typical informal activities in English" (i.e., online social networking, music, and some gaming for girls, more extensive gaming and watching YouTube for boys, see also SUNDQVIST, 2009; SYLVÉN & SUNDQVIST, 2012). Drawing on *activity theory* (Lantolf & Pavlenko, 2001), Hannibal Jensen concluded that the children's motivation for taking part in informal activities seemed to change the way in which they engaged with the associated affordances for language learning (see *linguistic engagement*, ARNDT, 2023). Most participants' informal use of English seemed to be driven by their interest in the activities themselves and a desire to participate in online communities. Children who were motivated in this way were more likely to employ various strategies for language comprehension, often viewed as the mark of effective language learners.	B5, B6, C4, E1, E4

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References	Annotations	Themes
Lai, C. (2019). Technology and learner autonomy: An argument in favor of the nexus of formal and informal language learning. *Annual Review of Applied Linguistics, 39*, 52–58. https://doi.org/10.1017/S0267190519000035	In this position paper, **Lai** discussed the dynamic, synergetic relationship between technology and learner autonomy (see BENSON, 2011), before briefly reviewing the literature on technology in support of autonomy in both formal and informal contexts. She argued that the two bodies of literature have largely developed in parallel, without much interaction, which has restricted avenues of exploration and inquiry. Lai called for greater efforts directed toward investigating the bidirectional relationships between the two contexts and suggested that doing so would allow for a more comprehensive understanding of technology-mediated learner autonomy in both formal and informal learning.	A2, A3
Lee, J. S., & Hsieh, J. C. (2019). Affective variables and willingness to communicate of EFL learners in in-class, out-of-class, and digital contexts. *System*, 82, 63–73. https://doi.org/10.1016/j.system.2019.03.002	Part of a series of studies by Lee and associates that focus on willingness to communicate (WTC) as a central variable in IDLE research (e.g., Lee & Drajati, 2019; Lee & Chiu, 2024), this study investigated affective predictors of 261 Taiwanese undergraduate EFL learners' WTC in-class, out-of-class, and in digital settings. Grit and L2 confidence significantly predicted WTC in all three contexts, whereas anxiety predicted WTC both in- and outside the classroom, but not digitally. **Lee and Hsieh** suggested that this may indicate that students (at least in the Asian context) generally feel more comfortable communicating in writing in digital environments than speaking in- or outside of class.	B4, E2, E3, E4
De Wilde, V., Brysbaert, M., & Eyckmans, J. (2020). Learning English through out-of-school exposure. Which levels of language proficiency are attained and which types of input are important? *Bilingualism: Language and Cognition, 23*(1), 171–185. https://doi.org/10.1017/S1366728918001062	Similar to KUPPENS (2010) and SYLVÉN (2022), this study measured OOC exposure to English in relation to receptive vocabulary, listening, speaking, reading, and writing skills in 780 Flemish children with no prior English classroom instruction. Results from the skills tests were highly variable, though it was reported that 10–25% of the children (depending on the skill in question) had already reached a CEFR A2 level in English. Despite the vast literature on extensive reading and viewing, these two activities were not as strongly correlated with overall proficiency in this study as social media, speaking, and gaming (in contrast to the lack of correlation with gaming in PETERS, 2018 and the negative correlation with gaming in MUÑOZ & CADIERNO, 2021).	B1, B3, C2, D2, D4, D5, D6, D7
Lamb, M., & Arisandy, F. E. (2020). The impact of online use of English on motivation to learn. *Computer Assisted Language Learning, 33*(1–2), 85–108. https://doi.org/10.1080/09588221.2018.1545670	This study focused on the relationship between ISLL and learners' attitudes toward classroom-based learning. The findings did not support the authors' *authenticity gap* (Henry, 2013) hypothesis that more frequent informal contact may lead students to perceive formal language instruction as less relevant. In fact, an analysis of self-report data from 308 university-level learners of English in Indonesia indicated significant *positive* links between the frequency of out-of-class contact and the ideal L2 self as well as attitudes toward formal learning. This stands in contrast to Sundqvist & Olin-Scheller (2013), who highlighted the prevalence of classroom *demotivation* within an EE context, and Arndt (2019), who did not find significant links between attitudes toward formal learning and ISLL quantity (but with affective, cognitive, and linguistic engagement in ISLL).	A2, B2, B3, C1, E4

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References	Annotations	Themes
Lee, J. S. (2020). Informal digital learning of English and strategic competence for cross-cultural communication: Perception of varieties of English as a mediator. *ReCALL, 32*(1), 47-62. https://doi.org/10.1017/S0958344019000181	Following Lee and Lee's (2019) finding of a positive relationship between IDLE and Korean students' perceptions of English as an International Language (EIL), this study explored the connections between IDLE, strategic competence for cross-cultural communication (CCC), and perceptions of varieties of English among 266 Korean EFL university students with no overseas experience. Drawing on questionnaire and interview data, **Lee** found that students who engaged in IDLE more frequently perceived themselves as more effective users of CCC strategies, and that perceptions of English varieties mediated the relationship between IDLE and strategic competence for CCC. In other words, students' perceptions of different English varieties became more positive through participation in informal activities, which increased their likelihood to adopt more effective CCC strategies (note that these are results from cross-sectional, not longitudinal data).	C1, E4
Lee, J. S., & Sylvén, L. K. (2021). The role of Informal Digital Learning of English in Korean and Swedish EFL learners' communication behaviour. *British Journal of Educational Technology*, 52(3), 1279–1296. https://doi.org/10.1111/bjet.13082	This publication reports on one of only a handful of cross-national comparative studies in this research area (see also Lee et al., 2022; MUÑOZ & CADIERNO, 2021; SCHURZ & SUNDQVIST, 2022; SUNDQVIST & UZTOSUN, 2024). Survey data about IDLE activities and willingness to communicate (WTC) in the classroom were collected from 388 Korean and 144 Swedish secondary school students. The authors thoroughly discussed issues of sampling and measurement equivalence to establish the validity of their cross-cultural comparison. Swedish students were found to participate more frequently in IDLE (both receptive and productive). In both groups, the overall frequency of IDLE significantly predicted classroom WTC (explaining 24% of variance in the Swedish but only 17% in the Korean sample). Yet, scores on the receptive vs. productive IDLE subscales only emerged as significant predictors in the Korean group. **Lee and Sylvén** attributed this to the different status of English in the respective societies, as well as distinct pedagogical approaches to language teaching, which they argued may mean that Korean students uniquely benefit from both receptive and productive activities.	B4, C1, C3, E4

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References	Annotations	Themes
Muñoz, C., & Cadierno, T. (2021). How do differences in exposure affect English language learning? A comparison of teenagers in two learning environments. *Studies in Second Language Learning and Teaching*, 11(2), 185–212. https://doi.org/10.14746/ssllt.2021.11.2.2	This is another cross-national comparative study, comparing language proficiency and OOC exposure to English among 14–15-year olds in Denmark and Spain. In addition to listening comprehension, this study targeted two skills that remain under-studied in the informal context: metalinguistic knowledge and grammaticality judgements. The Danish outperformed the Spanish learners in all aspects except metalinguistic knowledge and generally engaged more frequently in English activities OOC. Significant correlations between specific types of informal activities and language test scores also differed between the two populations. **Muñoz and Cadierno** argued that this reflected differences in the English-richness of the respective cultures (see dubbing/subtitling dichotomy in ALABAU et al., 2002), the relative linguistic distance between Danish/Spanish and English, and differences in formal English instruction. Notably, in contrast to prior research (e.g., SUNDQVIST & SYLVÉN, 2012; DE WILDE et al., 2020), this study found a *negative* correlation between language skills and gaming, which the researchers argued may represent an "opportunity cost," whereby time spent gaming takes away from the opportunity to engage in more effective OOC activities, especially for lower-level learners.	B3, B4, C2, D1, D3, D6
Zhang, R., Zou, D., Cheng, G., Xie, H., Wang, F. L., & Au, O. T. S. (2021). Target languages, types of activities, engagement, and effectiveness of extramural language learning. *PLoS One, 16*(6), e0253431. https://doi.org/10.1371/journal.pone.0253431	This publication constitutes the first systematic review in ISLL, covering 33 studies indexed in *Web of Science*. **Zhang et al.** found that 88% of these studies focused on informal learning of English (in addition to German, French, Chinese, and Japanese). Generally, listening to music, watching TV/films, and playing digital games were the most common informal activities (see SUNDQVIST, 2009; TOFFOLI AND SOCKETT, 2010; KUSYK, 2017), and a positive relationship was often found between informal activities and language development or motivational-affective variables, potentially mediated by the amount of engagement, interactiveness, linguistic difficulty, and learners' gender. Systematic reviews focusing on other aspects of ISLL research have since been published by Lee (2022), Guo and Lee (2023), Soyoof et al.(2023), Inayati et al. (2024), and KUSYK et al. (2025).	A1, C4, D1, E1, E4
Sylvén, L. K. (2022). Very young Swedish children's exposure to English outside of school. In C. Bardel, C. Hedman, K. Rejman, & E. Zetterholm (Eds.), *Exploring language education: Global and local perspectives* (pp. 121–155). Stockholm University Press. https://doi.org/10.16993/bbz	**Sylvén's** pilot study on 20 kindergartners and first graders (aged 3–7) in Sweden offers insights into the EE practices of very young learners. According to interviews and language diaries (completed by parents), watching YouTube videos was the most popular activity, followed by gaming, watching movies, and listening to music. Weekly exposure ranged from approximately 1–20 hours. A vocabulary test and picture description task suggested that different children had English proficiency levels equivalent to first language (L1) speakers aged between 2–4 and 14–16. **Sylvén** also reported significant, positive correlations between informal exposure and the lexical test/task results (though statistical findings from such small samples should be interpreted with caution). As the children had not yet received formal English instruction, their proficiency likely resulted from informal exposure (suggesting causality, see also KUPPENS, 2010; DE WILDE et al., 2020).	B3, B6, C1, D2, D7

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References	Annotations	Themes
Thorne, S., & Hellermann, J. (2022). Interfacing formal education and language learning beyond the classroom. In, H. Reinders, C. Lai & P. Sundqvist (Eds.), *The Routledge handbook of language learning & teaching beyond the classroom.* Routledge, 36-51.	In this reflective piece, **Thorne and Hellermann** addressed a prominent issue in the LLTBC literature: the formal/informal interface (see also RICHARDS, 2015; THORNE et al., 2009; WAGNER, 2015). They described in detail innovative pedagogical practices that incorporate forms of authentic L2 use, including fan fiction, exploration of linguistic landscapes, mobile augmented reality, and guided, learner-led opportunities to engage in everyday interactions (which the authors called *language learning in the wild*). Going beyond specific interventions, the authors also discussed the pedagogical approaches of *rewilding* (increasing the presence of vibrant, unpredictable, authentic L2 use in the classroom) and *bridging activities* (using student-selected texts as a point of departure for careful, guided analysis). Overall, this text highlighted the synergistic learning opportunities that can arise from bringing together ISLL experiences and classroom-based reflection and support.	A2
Schurz, A., & Sundqvist, P. (2022). Connecting extramural English with ELT: Teacher reports from Austria, Finland, France, and Sweden. *Applied Linguistics*, 43(5), 934-957. https://doi.org/10.1093/applin/amac013	This comparative study queried 534 upper secondary teachers from dubbing (Austria, France) and subtitling (Finland, Sweden) countries about their students' EE practices as well as the perceived impact on teaching and learning. The results showed some similarities among the four countries: Teachers collectively designated writing skills, grammar, and formal language usage as "not affected," or sometimes "negatively affected" by EE. They also agreed on the importance of both connecting the informal and formal spheres and bringing EE material into the classroom. However, numerous statistically significant differences also emerged between (a) subtitling and dubbing countries: e.g., more frequent EE use was reported in subtitling countries, as well as greater teacher awareness of knowledge gaps perceived as potential results of EE; and (b) between individual countries, e.g., with France having the lowest EE usage and French teachers believing the least in the learning benefits of EE. The authors suggest that educators in dubbing countries will likely need to adapt their teaching to learners' expanding EE usage (see also RICHARDS, 2015; THORNE et al., 2009; WAGNER, 2015).	A2, B2, B4, C1
Arndt, H. L. (2023). Construction and validation of a questionnaire to study engagement in informal second language learning. *Studies in Second Language Acquisition,* 45(5), 1456–1480. https://doi.org/10.1017/S0272263122000572	Substantial variability and sometimes contradictory findings in prior research suggest that not all learners participate in and/or benefit from ISLL in the same way (e.g., COLE & VANDERPLANK, 2016; LAI et al., 2015; LEE & DRESSMAN, 2018). Arguably, the considerable focus on IDs in more recent ISLL research can be seen as one way of trying to make sense of this issue. **Arndt** suggested that another way would be to look at the specific ways in which learners *engage* with informal activities, not just in terms of quantity and diversity but also concurrent thoughts and feelings (see also Arndt, 2023, in additional references). This paper reported on the development and initial validation of the *Informal Second Language Engagement questionnaire* (ISLE), an instrument designed to capture affective, behavioral, cognitive, and linguistic aspects of engagement in ISLL. Full results from the larger project on German secondary school students' engagement in ISLL and their developing L2 proficiency, motivation, and attitudes toward language learning were reported in Arndt's (2019) Ph.D. dissertation.	A4, B3, C2, C3, C4, E3, E4

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References	Annotations	Themes
Bengtsson, A. (2023). The effects of extramural language: Relationships between engagement in Japanese language activities and general Japanese language proficiency [Doctoral thesis, University of Stockholm]. https://su.diva-portal.org/smash/record.jsf?pid=diva2%3A1805629&dswid=-9491	Similar to ARNDT (2023), **Bengtsson** identified a need for theory-informed, purpose-built research instruments to increase rigor and replicability in future ISLL studies. He proposed three *Activity Dimensions* (ADs: communicative direction, linguistic and non-linguistic modalities) to distinguish different types of informal practices, which informed the design of a retrospective questionnaire and language diary. Focusing on learners of Japanese (see also Dizon, 2021; Imura, 2018; Kurata, 2024) at a Swedish university, this study was one very few investigating informal learning in a language other than English. The findings regarding the nature and quantity of informal practices and their relationship to language proficiency were largely similar to those in studies with English learners, leading Bengtsson to conclude that "such research is likely applicable to any target language" (p. 203). The study also included the collection of longitudinal data (albeit from a very small sample), which provided some evidence of informal activities causing changes in L2 proficiency, but not of prior proficiency affecting involvement in ISLL.	A3, A4, B4, B7, C1, C2, D1
De Wilde, V. (2024). Research methods for investigating young learners' engagement with foreign languages outside of school. *Research Methods in Applied Linguistics*, 3(3), 100159. https://doi.org/10.1016/j.rmal.2024.100159	A review of quantitative, qualitative, and mixed methods that have been used to research EE among young learners, aged 6–12 (see also contributions in Reinders et al., 2022b, PART III). As in the broader ISLL literature (see Lee, 2022; SUNDQVIST & UZTOSUN, 2024), questionnaires and language diaries focusing on the frequency and quantity of informal activities were identified as most common, often used in combination with interviews and focus groups. **De Wilde** provided general recommendations for how to apply, adapt, and improve extant methods for use with younger learner groups.	A1, A4
Liu, G., & Darvin, R. (2024). From rural China to the digital wilds: Negotiating digital repertoires to claim the right to speak. *TESOL Quarterly*, 58(1), 334–362. https://doi.org/10.1002/tesq.3233	**Liu and Darvin** present an in-depth, qualitative investigation of the informal digital practices of two Chinese university-level learners of English. Reminiscent of early digital literacy studies (see THORNE et al., 2006) of migrant (L2) language learners, this study explored the role of informal English language activities in the identity development of two students from rural China. Drawing on sociocultural theory, the researchers investigated the ways in which these learners, after feeling marginalized by peers and teachers in their English-language classrooms due to their educational and cultural backgrounds, were able to reframe their identities as successful speakers of English through participation in online fan spaces and connections with other speakers of English as a foreign language. They also showed the effects of these developments on the learners' subsequent participation in formal and informal English language learning contexts. The authors concluded by reflecting on how language teachers may help cultivate in their students the awareness and agency to empower them to leverage the linguistic, social, and cultural opportunities afforded by online spaces.	B1, B2, B5, E2, E3, E4

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References	Annotations	Themes
Liu, G., & Ma, C. (2024). Measuring EFL learners' use of ChatGPT in informal digital learning of English based on the technology acceptance model. *Innovation in Language Learning and Teaching*, 18(2), 125–138. https://doi.org/10.1080/17501229.2023.2240316	With the vast increase in the popularity of generative artificial intelligence (GenAI), researchers have become interested in the potential of these technologies to support ISLL. However, students' interactions with GenAI in relevant studies have typically been teacher-initiated and -guided (Guan et al., 2024). **Liu and Ma** studied 405 Chinese English learners' experiences using ChatGPT for ISLL through the lens of the *Technology Acceptance Model* (Davis, 1989). They found that positive attitudes toward using ChatGPT for informal learning predicted learners' behavioral intentions and their actual GenAI usage. Although the study did not provide insight into the relationship between the use of ChatGPT and language development, the authors concluded that teachers should highlight the technology's positive affordances for ISLL.	B4, E4
Sundqvist, P. (2024). Extramural English as an individual difference variable in L2 research: Methodology matters. *Annual Review of Applied Linguistics*, 1–13. https://doi.org/10.1017/S0267190524000072	In this position paper, **Sundqvist** called for the wider field of SLA research to consider EE as a core ID variable. She argued that, in many contexts, EE has now replaced classroom teaching as the actual foundation of L2 English learning at a young age (see SYLVÉN, 2022) and should therefore be measured in any study on L2 development. The paper also included a brief review of recently developed targeted research instruments (including ARNDT, 2023; SUNDQVIST & UZTOSUN, 2024) and a discussion of areas where further research is needed.	A1, A3, A4
Sundqvist, P., & Uztosun, M. S. (2024). Extramural English in Scandinavia and Asia: Scale development, learner engagement, and perceived speaking ability. *TESOL Quarterly*, 58(4), 1638–1665. https://doi.org/10.1002/tesq.3296	Like ARNDT (2023) and BENGTSSON (2023), **Sundqvist and Uztosun** recognized the need for common, validated research instruments to facilitate the comparison and replication of results across different ISLL contexts. This paper described their process of developing the *EE Scale*, a summative self-report questionnaire targeting how frequently learners engage in various types of informal activities and testing various aspects of the instrument's reliability and validity in the Scandinavian and Asian context.	A4, C1, C4, B4
Kusyk, M., Arndt, H. L., Schwarz, M., Yibokou, K. S., Dressman, M., Sockett, G., & Toffoli, D. (2025). A scoping review of studies in informal second language learning: Trends in research published between 2000 and 2020. *System*, 130, 103541. https://doi.org/10.1016/j.system.2024.103541	The paper reports on the largest ISLL scoping review to date, analyzing 206 publications over a period of 20 years (cf. Inayati et al., 2024; Soyoof et al., 2023; ZHANG et al., 2021). Investigated topics included terminology, theoretical frameworks, research designs and methods, learner populations, target languages, L2 proficiency development, informal activities, individual difference variables, and pedagogical applications. **Kusyk et al.** discussed issues of definitional and terminological clarity and identify signs of growth within the field, including a move toward more complex study designs, methods, and analytical approaches. They suggested that ISLL studies can be grouped into three thematic waves (see Section 1), which re-occur as interest in ISLL research arises in new geographic areas/cultural contexts.	A1, A2

CREDiT authorship contribution statement. **Henriette L. Arndt:** Conceptualization (equal), data curation (equal), formal analysis (equal), investigation (equal), project administration (equal), validation (equal), visualization (lead), writing – original draft (equal), writing – review & editing (lead). **Meryl Kusyk:** Conceptualization (equal), data curation (equal), formal analysis (equal), investigation (equal), project administration (equal), validation (equal), writing – original draft (equal), writing – review & editing (supporting).

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Competing interests. None.

Notes

1. Asterisks indicate that the full reference for this work can be found in the subsequent timeline.
2. Small capitals indicate work which appears elsewhere in the timeline.

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