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The survival of contrastive analysis hypothesis: Reevaluates criticisms and highlights its value in cross-cultural communication studies

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Abstract - Contrastive Analysis Hypothesis (CAH) has long been an important tool in understanding the relationship between the first language (L1) and the second language (L2). CAH can be traced to its origins: the behaviorist theory, whose primary role was to predict linguistic interference. However, since this hypothesis has been criticized for not being inclusive and sensitive about learner errors, it left the spotlight to Error Analysis and Interlanguage Theory. However, this systematic review of 19 empirical articles sourced from the Web of Science (2016–2025) reveals that CAH remains highly relevant. Current research demonstrates a paradigm shift: it is not only used as a tool to identify errors, but it also helps educators foster linguistic awareness and bridge the gap between L1 and target-language structures. The study concludes that CAH is a prominent tool, despite previous criticisms, and can be a practical way to enhance both teaching methodologies and learner outcomes when applied in a balanced manner.

Keywords: contrastive analysis hypothesis, second language acquisition, error analysis

1. Introduction

1

The Contrastive Analysis Hypothesis (CAH), originating in the 1950s, posits that differences between a learner's first language (L1) and the target second language (L2) can predict areas of difficulty in language acquisition. Early strong versions of CAH claimed that direct contrasts between L1 and L2 structures could reliably forecast learner errors, but this deterministic view has been largely discredited due to its oversimplification and failure to account for the dynamic nature of language learning. However, weaker and moderate versions of CAH remain influential, emphasizing that while linguistic differences may signal potential interference or transfer issues, they do not deterministically cause errors; instead, they highlight areas where learners might struggle or avoid certain structures (Al-Rickaby, 2022; Zobl, 1982; Thao, 2020).

CAH has been particularly useful in pedagogical contexts for syllabus design and error prediction by comparing phonological, grammatical, and lexical features across languages, aiding teachers in anticipating learner difficulties and tailoring instruction accordingly (Khansir & Pakdel, 2019; Alsaedi, 2025; Li, 2021).

Moreover, recent perspectives integrate typological markedness to assess the relative degree of difficulty posed by specific linguistic contrasts, refining CAH's predictive power beyond simple binary distinctions (Eckman, 1977).

Overall, CAH contributes to understanding cross-linguistic influence as part of a broader framework that includes error analysis and interlanguage development, recognizing that L1 influence is indirect and constrained by universal grammar principles and developmental sequences in L2 acquisition (Lardiere, 2009; Wardhaugh, 1970; Khansir & Pakdel, 2019; Tajareh, 2015).

Research has refined CAH by emphasizing developmental sequences in second language acquisition rather than static comparisons of mature L2 structures, highlighting that L1 influence is indirect and constrained by markedness—typological difficulty levels that affect learning challenges (Zobl, 1982; Eckman, 1977).

Recent studies argue for the continued relevance of CAH beyond phonology and grammar to include cultural traits and discourse-level analysis, which can enhance cross-cultural communication understanding (Al-Rickaby, 2022; Kostova, 2022).

Despite criticism, CAH remains a valuable pedagogical tool for syllabus design and error analysis in language teaching contexts worldwide (Khansir & Pakdel, 2019; Tajareh, 2015; Namaziandost, 2017). Overall, the hypothesis has evolved from a rigid predictive model to a more nuanced framework incorporating typological markedness and developmental perspectives to better explain second language learning processes (Namaziandost, 2017; Zobl, 1982; Eckman, 1977).

The Contrastive Analysis Hypothesis (CAH) has been a significant theory in second language acquisition since the 1950s, initially proposing that differences between a learner's first language (L1) and the target language predict learning difficulties. Early strong versions of CAH, which claimed direct prediction of errors based on linguistic contrasts, have been largely discredited, but weaker and moderate versions remain influential in understanding language interference and error patterns (Wardhaugh, 1970; Khansir & Pakdel, 2019; Tajareh, 2015).

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Research problems related to the Contrastive Analysis Hypothesis (CAH) primarily revolve around its predictive limitations and theoretical assumptions. One major issue is that CAH often fails to accurately predict the specific errors learners will make, as language acquisition involves complex developmental sequences rather than direct transfer of L1 structures to L2 (Zobl, 1982).

The strong version of CAH, which claims straightforward error prediction based on linguistic contrasts, has been widely criticized as unrealistic and overly simplistic (Wardhaugh, 1970). Another problem is the insufficient consideration of markedness and typological difficulty in early CAH models, which newer research suggests are crucial for understanding relative learning challenges (Eckman, 1977).

Additionally, CAH tends to focus on surface-level linguistic differences without adequately addressing deeper cognitive, cultural, and discourse factors influencing second language learning and cross-cultural communication (Al-Rickaby, 2022; Namaziandost, 2017). Finally, there is a need for more dynamic and integrative models that incorporate developmental stages and indirect L1 influence rather than static comparisons of mature language forms (Zobl, 1982; Dost & Bohloulzadeh, 2017).

2. Method

2.1. Article Selection

For the purpose of this systematic review on CAH, article selection was conducted through the Web of Science (WoS) database. This database was preferred because it is a well-known source used by researchers worldwide, and its advanced search tools helped narrow down the number

of articles more effectively (Li, K., Rollins, J., & Yan, E., 2018). In order to find articles that align with this review's research questions, keywords were chosen: Contrastive analysis, contrastive analysis hypothesis, contrastive analysis between languages, language comparison, contrastive analysis in SLA, and language transfer. As many studies have been done on CAH, the keywords were searched as "title" for pragmatic reasons. This way, the author was able to narrow down the articles as much as possible.

For the first step of this research, Boolean terms were entered into the database system of WoS: TI= ("contrastive analysis" OR "contrastive analysis hypothesis" OR "contrastive analysis between languages" OR "language comparison" OR "language transfer" OR "contrastive analysis in sla").

The total number of results was 4,419 documents. Afterwards, studies that were not articles and were not in English were removed from the search. The publication year was narrowed to the last decade (2025-2016) to obtain the most relevant and current research in the field. Only Social Science Citation Index (SSCI) and Arts & Humanities Citation Index (A&HCI) articles were chosen. As the concept of contrastive analysis can be applied in different fields, the studies were narrowed down to Linguistics, Language Linguistics, and Education Educational Research categories from the WoS drop-down menu. This way, 284 studies remained. These criteria were used to include studies, and articles that did not meet them were excluded from the review.

After the studies were selected, a quick skim of the titles and abstracts was conducted, and it was concluded that further elimination was needed, as some of the remaining articles did not address this systematic review's research questions or align with the study's aim. Based on this, the following exclusion criteria were applied: (1) As the study aims to delve deeper into research on contrastive analysis and language transfer, some variables were excluded, such as studies on sign language, language impairment, aphasia, and comparisons between disabled and non-disabled language users. (2) Translation studies were excluded because they usually focus on different paradigms. (3) Studies comparing monolinguals with different L1s were removed. (4) If the article investigated how the developmental sequences of bilingual children change, this article was excluded. (5) Studies that were reviews and did not do empirical research were removed. (6) Studies that researched L1-L3 or L2-L3 relationships were removed.

Only studies that examined the contrastive analysis of participants' L1 and L2 were included in this systematic review. After this elimination and inclusion process, the final number of articles remaining was 19. As the number was finalized, steps for coding were taken.

3. Results and Discussion

3.1 Results

3.1.1. Theoretical Frameworks

Firstly, each article's theoretical framework and its mention in the articles were coded by skimming the articles. After the theories were named, each theory was grouped by its aim. *How the languages interact* code was decided for the theories where the transfer or interplay between different languages. This category was represented by theories such as Cross-linguistic Transfer (CLT), Transfer Facilitation Model, Interactive Framework of Transfer, and it included 5 articles (Ghazi-Saidi & Ansaldi, 2017; Huang et al, 2025; Ke & Koda, 2021; Lü et al., 2025; van Maastricht et al, 2016). For the second category, the code, *how the brain stores 2+ languages*, was chosen in order to group the theories that talk about how multiple languages were stored and in which ways they were accessed. This category was represented in 5 articles (Janssen et al., 2017; Romano, 2021; Sasson et al, 2025; Wang & Yum, 2022; Wealer et al, 2025), and the theories are: Interdependency Hypothesis, Basic Continuity Hypothesis, Shared vs Separate Syntax, Shared Representation, and Revised Hierarchical Model. The third category is how we *learn/process* the language. This category includes 4 articles (Baicchi & Della Puta, 2019; Barking et al., 2025; Steele & Yeatman, 2025; Zhao et al, 2024) and the theories included in this category are related to how the brain or the individual processes information, manages new sounds, and builds the mental maps necessary to understand and speak a language. These are Optimality Theory, Noticing

Theory, Usage-based Approach, and Cognitive Construction Grammar. One article mentioned theories that fit the three categories mentioned above (Bhallo et al., 2025).

Apart from these, the Phonology, Narrative, & Dialect code is used to categorize theories applied to specific parts of language, such as phonology or storytelling. The articles that mentioned these theories (Kapalková et al., 2016; Kopotev et al., 2025; Mooney, 2019) included Phraseology, Speech Learning Model, and Story Grammar Model. Only one theory did not explicitly mention its name (Tsukada et al., 2025).

3.1.2 Methodology and Research Design

All the articles used a quantitative research approach to obtain their results, except for one (Steele & Yeatman, 2025). In contrast, each article had a different number of participants, ranging from 10 to 165. The distribution of participant counts is shown in Figure 1.

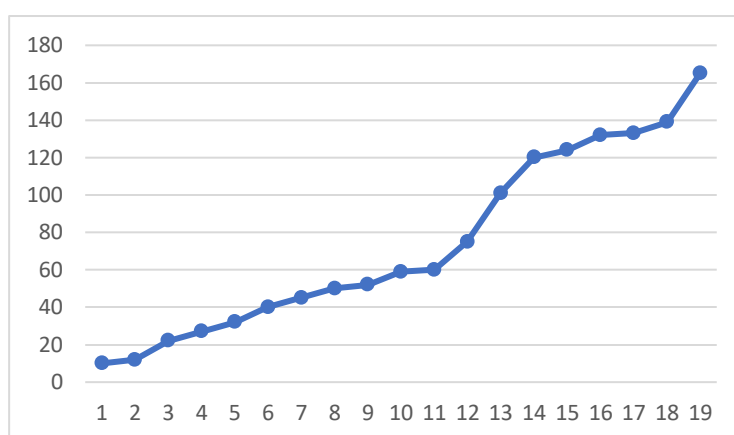


Figure 1. Number of Participants

To collect data, each article used different data collection tools for its specific aims. In Figure 2, the distribution of the number and kind of data collection tools used is shown. The most frequently used data collection tool was tasks, which mostly focused on production-related tasks (7). Some studies used tasks and tests simultaneously (4), and others used tests only (3), including comprehension or assessment tests. Two of the studies used recordings as the data collection tool, and the rest of them used task & sociolinguistic interview (1), corpus (1), or fMRI test (1). Table 2 can be referred to find which articles use each data collection tool mentioned above.

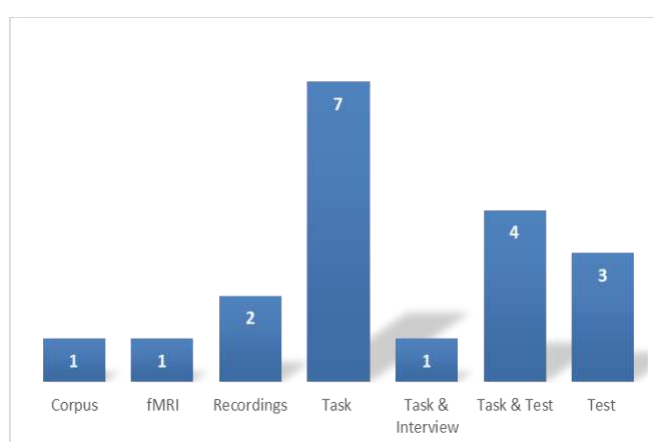


Figure 2. Data Collection Tools

Table 2. Articles that used each data Collection Tool

Data Collection Tool	Articles
Corpus	Kopotev et al., 2025

fMRI Recordings Task	Ghazi-Saidi & Ansaldo, 2017; Zhao et al, 2024; Steele & Yeatman, 2025; Baicchi & Della Puta, 2019; Barking et al, 2025; Huang et al, 2025; Ke & Koda, 2021; Tsukada et al, 2025; van Maastricht et al, 2016; Romano, 2021
Task & Interview	Mooney, 2019
Task & Test	Lü et al., 2025; Janssen et al., 2017; ; Kapalková et al., 2016; Wang & Yum, 2022
Test	Bhallo et al, 2025; Sasson et al, 2025; Wealer et al, 2025;

Each article that is chosen for this systematic review was found to use different kinds of research designs for the purpose of their studies. The most commonly used design was cross-sectional, in which the researcher conducts a study at a single point in time. The number of articles that used this design was 5 (Sasson et al., 2025; Romano, 2021; Zhao et al., 2024; Tsukada et al., 2025; Janssen et al., 2017). This number is followed by the experimental design in 4 articles (Huang et al, 2025; Baicchi & Della Puta, 2019; Ghazi-Saidi & Ansaldo, 2017; Wang & Yum, 2022). After this, comparative articles are used to compare the results of two or more groups. This category was used by 3 articles (Barking et al, 2025; Kapalková et al., 2016; Mooney, 2019). Both experimental and comparative designs were used in 1 article (van Maastricht et al, 2016). Longitudinal (Bhallo et al, 2025; Wealer et al, 2025) and correlational designs (Ke & Koda, 2021; Lü et al., 2025) are used in 2 articles each. Lastly, CPAR (Steele & Yeatman, 2025) and Corpus-driven designs (Kopotev et al., 2025) were used 1 time each. In Figure 3, the research design types and the number of articles using each type are shown.

2.2. Coding

After the short-listed articles were identified, these articles were reviewed systematically. This way, the author was able to find recurring themes and patterns in these studies. Accordingly, the author formed 12 codes both by looking deeper into existing literature and consulting experts' opinions. These codes include: theoretical framework, research approach, research method, sample size, participant profile, instruction type, research design, transfer type, linguistic feature, language pairs, conclusion, limitations, and suggestions for stakeholders. The codes for methodology, theoretical frameworks, language pairs, and limitations were decided beforehand; as a result, it was a bottom-up approach. However, the rest of the codes were determined as the author read the articles, which makes it a top-down approach (Saldaña 2016).

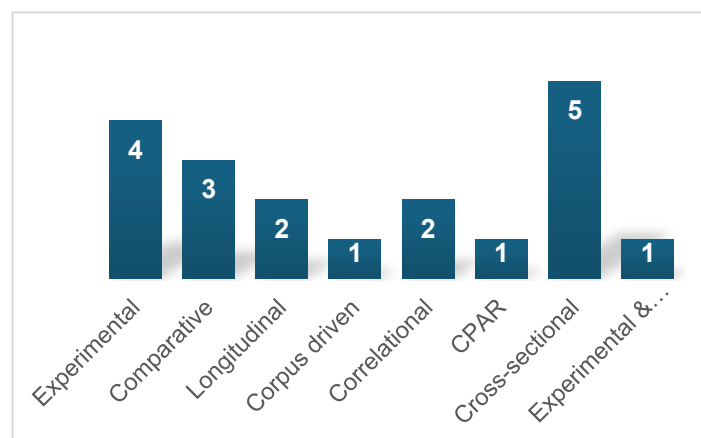


Figure 3. Research designs used in each article

3.1.3 Language and Transfer

Articles were analysed to determine which language pairs were examined in each study in order to answer research question 1 (Which language pairs and linguistic features have been focused

on in recent CAH research?). When the results were considered, it is clear that CAH studies have been conducted across many languages and language pairs. Nevertheless, Chinese and English have been two of the most researched languages in the pair, either as L1 or L2. Chinese was present in 4 studies (Lü et al., 2023; Huang et al., 2025; Wang et al., 2022; Ke et al., 2021) and English was present in 8 studies (Lü et al., 2023; Huang et al., 2025; Wang et al., 2022; Bhallo et al., 2025; Baicchi & Della Putta, 2019; Zhao et al., 2024; Kooptev et al., 2025; Kapalková et al., 2016; Sasson et al., 2025; Steele & Yeatman, 2025). In addition to these languages, Urdu, Vietnamese, Japanese, Cantonese, Russian, German, Luxembourgish, Dutch, Swedish, Italian, Slovak, Hebrew, Persian, French, Spanish, Turkish, Lingo, and Occitan were used in one of the investigated language pairs.

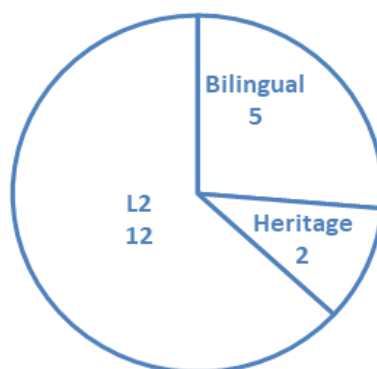


Figure 4. Number of participants

All the participants in these studies came from different backgrounds, and their aims for learning the language varied. Some participants learnt this language as an L2 for different reasons, as mentioned above. Some already had mastery of these languages, and the others were learning them as heritage languages. The numerical data in Figure 4 show that, in these studies, 12 collected data from L2 learners, 5 from bilinguals, and 2 from heritage language learners. In Table 3. The article provides the reasons students learnt these languages.

Table 3. Aims of Learning for each participant

Aim of Learning	Articles
L2	Baicchi & Della Puta, 2019; Barking et al., 2025; Ghazi-Saidi & Ansaldo, 2017; Huang et al, 2025; Ke & Koda, 2021; Kopotev et al., 2025; Sasson et al, 2025; Steele & Yeatman, 2025; Tsukada et al, 2025; van Maastricht et al, 2016; Wang & Yum, 2022; Zhao et al, 2024
Bilingual	Janssen et al., 2017; Kapalková et al., 2016; Lü et al., 2025; Wealer et al, 2025; Mooney, 2019
Heritage	Bhallo et al, 2025; Romano, 2021

In order to answer the remaining part of research question 1, the most researched linguistic features were investigated in each article. Results showed a variety of categories, ranging from the most used, vocabulary (6 studies), to phonology (5), grammar (3), syntax (2), and morphosyntax, speaking, and reading (1 each). In Figure 5, the numerical distribution can be seen.

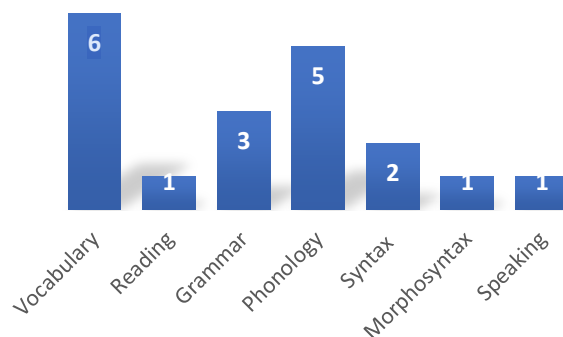


Figure 5. Linguistic Features Used in the Articles

After this, whether there was a transfer of evidence was analysed across the articles, and the results varied: Developmental or Complex Transfer, Positive Transfer, Negative Transfer, and No Transfer Evidence (Figure 6). Positive transfer was marked when the L1 of the students helped in the process of learning L2 (Baicchi & Della Puta, 2019; Ghazi-Saidi & Ansaldo, 2017; Ke & Koda, 2021; Wang & Yum, 2022; Janssen et al., 2017; Wealer et al, 2025; Bhallo et al, 2025); if it interfered with language learning, then Negative Transfer was marked for this article (Mooney, 2019; Steele & Yeatman, 2025; Zhao et al, 2024; Huang et al, 2025; Sasson et al, 2025). Only one study reported little to no transfer evidence (Romano, 2021). Developmental or Complex Transfer category was marked when the transfer evidence was not “black & white” (van Maastricht et al, 2016; Kapalková et al, 2016; Barking et al., 2025; Kopotev et al., 2025; Tsukada et al, 2025; Lü et al., 2025). For instance, some research showed it depended on how well a student had mastered the skill in their first language (Lü et al., 2023), and in some cases it was dependent on the level of the students (Tsukada et al., 2025).

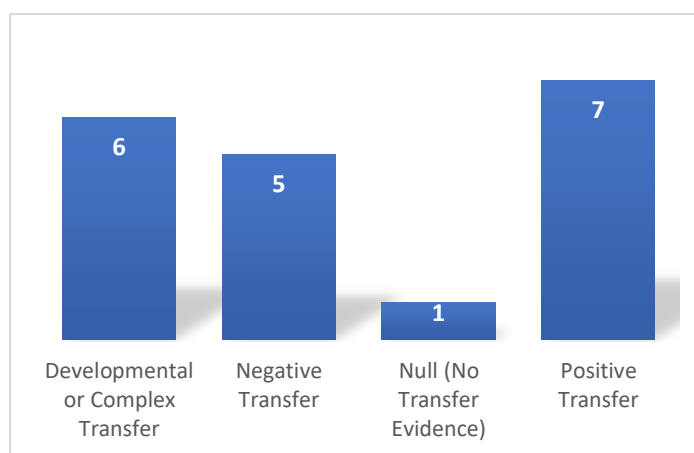


Figure 6. Transfer Evidence

However, when the transfer direction was examined, fifteen articles reported a transfer mainly from L1 to L2. Two findings showed bidirectional transfer evidence, and one found no transfer evidence. One of the articles reported a transfer from L2 to L1, which was this article's main focus. Table 4 can be consulted to see which articles found which transfer direction.

Table 4. Transfer Distribution

Transfer Direction	Article
L1 to L2	Baicchi & Della Puta, 2019; Bhallo et al, 2025; Ghazi-Saidi & Ansaldo, 2017; Huang et al, 2025; Janssen et al., 2017; Kapalková et al., 2016; Ke & Koda, 2021; Kopotev et al., 2025; Mooney, 2019; Sasson et al, 2025; Steele & Yeatman, 2025; Tsukada et al, 2025; Wang & Yum, 2022; Wealer et al, 2025; Zhao et al, 2024
L2 to L1	Barking et al., 2025
Bidirectional	van Maastricht et al, 2016; Lü et al., 2023
No Transfer Evidence	Romano, 2021

3.2 Discussion

This study investigated recent research on CAH and carefully examined which linguistic features, language pairs, and methods have been studied in this context. By doing so, the aim was to identify how CAH has evolved and been applied to research and classroom practices, and to identify the limitations of this hypothesis.

First of all, the theoretical framework of CAH has been analysed, and the theories that were used in CAH studies were divided into different categories, such as “how we learn/process, how the languages interact, how the brain stores 2+ languages...”. These umbrella terms refer to theories that show that CAH is not used to identify errors, but rather serves as an evidence-collection mechanism for various theories and hypotheses. One example is the implementation of CAH within a Usage-Based Approach (Barking et al. 2025). Another interesting finding was that Ghazi-Saidi & Ansaldo (2017) used fMRI to provide evidence for Cross-Linguistic Transfer. This shows that CAH is not only a classroom technique used by teachers but can also be integrated into various scientific studies. In this manner, we can conclude that CAH can be an important tool for collecting data not only for focusing on structural differences but also for different disciplines such as cognitive linguistics and neurolinguistics.

This systematic review has also revealed that each article has used different kinds of data collection tools, ranging from tasks to tests to interviews and corpus. We can see that sometimes tasks and tests are used at the same time; it might be because, the nature of tasks (especially the production-related ones) can make it difficult to collect data, as the language is a choice, and it is difficult to direct the participants to produce the exact structure we would like to elicit. For this reason, tests can be an important component in data collection. Also, tests can limit the subject to the researcher’s needs while being easy to implement, depending on the researcher’s style. For example, interviews might take a while to conduct, and they might also require a different kind of research ethics committee approval. The same rationale might apply to collecting data from a corpus. For example, in a study included in this systematic review (Kopotev et al., 2025), the authors collected data from learners at different levels and compared it with a reference corpus. This will take more time, as students at different levels need to be observed for a while to collect the necessary data. Lastly, fMRI studies might be difficult to conduct because participants must undergo an MRI, which requires additional funding, equipment, and participant motivation.

Similarly, the research design will depend on the data collection tools and the aim of the research. The reason the cross-sectional designs were prioritized might be their efficient nature, which focuses on identifying prevalence or characteristics within a population without the need for long-term tracking. The time constraints and scarcity of resources might explain why the longitudinal studies were chosen less. Comparison is in the nature of Contrastive Analysis, as its name suggests, so it is no surprise that Comparative Design was also one of the most used designs on the list.

When we analyse the results for language pairs and transfer, we can see that many studies have been conducted on Chinese and English, which can be attributed to their international impact and global importance. There is no doubt that these two languages are typologically different, and because of this, the language pair seems appealing for CAH studies. Other than this, we can see that many of the language pairs have been chosen from typologically distant pairs, such as L1 Dutch and L2 Spanish (van Maastricht et al. 2016) and Swedish and

Italian (Romano, 2021). However, there have also been some studies between typologically similar languages such as German and Dutch (Barking et al. 2025).

Secondly, whether there has been a transfer of evidence between these languages has been a research topic in these studies, and we can see not only negative transfer but also positive transfer and bidirectionality. This shows us that CAH has evolved not only to focus on the “interference” but also to serve different purposes. One study even investigated whether there has been a transfer from L2 to L1 (Barking et al. 2025), which would contradict the views of CAH at the time of its emergence. However, one supporter of this view can be Vivian Cook (2003). She suggests that a person's L1 isn't isolated; it changes and adapts as they learn a second language, meaning that learning a new language can reformat our L1 in various ways.

There has also been a category made for “Developmental or Complex Transfer” evidence. From this, we can see that transfer is not only about the mistakes occurring from one language to another, but it can also have different shapes or forms. For example, in one study, evidence shows that negative transfer is prominent at the beginner stage, but as students reach advanced levels, they can engage in more positive transfer (Tsukada et al., 2025). Also, some studies found that the transfer type can depend on the level of development of L1 skills as well (Wealer, 2025).

Lastly, when we look at the most-searched linguistic features, we see that skills such as reading and speaking have not been chosen very frequently; researchers preferred features such as vocabulary and phonology more often. This may be because these microlinguistic features allow researchers to measure performance. For example, in order to comprehend a reading passage, the learner should know the vocabulary well, and if they know reading strategies in their L1, they can transfer them easily. Also, the familiarity and interest in a passage can make things easier or more difficult for some students. In speaking, however, if they are being tested, then the anxiety and learners' characteristics can interfere with their speaking performance. Skehan & Foster (2001) argue that students need to “trade off” certain things when performing cognitively demanding tasks. They cannot focus on the complexity, accuracy, and fluency all at once. Because of this, it is difficult to say whether an error is due to fatigue or to transfer. However, it is easier to collect data on micro-linguistic features such as vocabulary and phonology. They do not require the brain to do many tasks at once.

4. Conclusion

This systematic review has provided comprehensive data on how recent studies on CAH have been conducted and has helped inform recent developments in language learning. In order to detect the most used language pairs, linguistic features, and methodological applications, the 19 studies were analysed from different perspectives. At the end of the analysis, it was concluded that historically, CAH has been used only as a tool for error prediction; however, nowadays it has seen a paradigm shift where it is used as a data collection method to help other studies.

This study is significant because it shows that CAH remains relevant in language research, though it is now used across more diverse fields than originally criticized (Wardhaugh, 1970). We can see that diverse data collection tools and research designs have been used in CAH studies to identify not only for error detection in language transfer models but also aiming to explain the cognitive architecture of the multilingual brain, the interaction between these languages, and the language learning process. Although these are big steps since the first establishment of CAH, we can identify some limitations in the studies.

One challenge that was identified is the difficulty of data collection. It was observed that most researchers opted for research focusing on micro linguistic features, as they are easier to isolate from other affecting factors. As language remains a matter of choice, it is difficult to direct the participants in productive skills such as speaking and writing while aiming to obtain natural and neutral data results. Also, many studies used cross-sectional designs because they are easier

to collect data at a single point in time; however, the value of longitudinal studies is undeniable. They will be able to show more of the routes and the evaluation of mistakes the multilinguals go through when learning a new language. Although these kinds of studies will be important, they can be expensive and, as the name suggests, will take longer. Aside from choosing data collection tools, another limitation might be understanding what is considered an "error". In order to ensure the errors are identified correctly, many researchers opted for studies that can show the errors very clearly, such as the micro linguistic features mentioned above.

From a pedagogical perspective, it was suggested that educators should understand that language distance causes a cognitive load, and that, therefore, teachers should modify their teaching methods based on the linguistic distance (Ghazi-Saidi & Ansaldo, 2017). Also, Wealer et al. (2025) found that challenges in L1 can predict challenges in L2, suggesting that strengthening L1 skills is very important for students' language learning journey. Aside from the skills, the L1's innate nature will affect the L2 learning process in areas such as phonology and syntax. Sasson et al. (2025) stated that in order to improve reading comprehension, teachers should provide explicit instruction on cross-language syntactic differences, as this will help to diminish the negative effects of L1 syntax on L2 reading comprehension. Educators should use contrastive analysis to help students better identify the differences in pronunciation and dialects while making sure that these aspects are practiced through productive activities (Steele & Yeatman, 2025; Tsukada et al., 2025; van Maastricht et al., 2016).

Finally, as for suggestions for future studies, researchers can conduct detailed studies across different language pairs, both distant and related languages. Also, many studies have focused on the transfer from L1 to L2, but in some cases, the reverse transfer is also possible. This can be an interesting study for some research. Aside from this, longitudinal studies can be done to collect more data from the learners, which can give us insights into how the errors develop depending on the L1, and they can detect the transfer in different skills, such as reading and speaking.

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