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Review

A Systematic Review on the Relationship Between Language Aptitude and Second Language Grammar Acquisition: Do Different Instructional Approaches Play a Role?

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Abstract: Although substantial research supports language aptitude's critical role in second language acquisition (SLA), how individual differences in aptitude interact with instructional approaches to influence grammar learning outcomes remains underexplored. Most prior studies examined aptitude effects in isolated instructional contexts, leaving the potential causal mechanisms of aptitude across instructional treatments largely uninvestigated. This systematic review analyzed nine empirical studies to characterize the relationship between language aptitude and L2 grammar acquisition, and determine whether instructional variations moderate this association. Findings demonstrated a robust correlation between aptitude and grammar learning success, but revealed differential outcomes depending on instructional design. Methodological inconsistencies in measuring aptitude and grammar proficiency, alongside mediating contextual factors, were identified as potential confounders. The review emphasizes integrating aptitude assessments into instructional design for grammar pedagogy and advocates for standardized measurement tools to advance SLA research. Directions for future inquiry include longitudinal investigations of aptitude-instruction interactions and expanded theoretical frameworks.

Keywords: language aptitude; second language; grammar acquisition; instructional approaches; interaction

1. Introduction

Second language acquisition (SLA) outcomes exhibit substantial variability among learners, influenced by multiple interacting factors. Research on individual differences has identified language aptitude as a key determinant of L2 attainment [1-3]. In L2 research, two seminal frameworks have emerged to define language aptitude: Carroll conceptualized it as cognitive capabilities determining an individual's efficiency in learning a foreign language under specific time and conditions [4]. This framework underscores the predictive power of language aptitude for proficiency outcomes across instructional contexts. Carroll advocated for a universal teaching methodology, opposing the adaptation of instructional strategies to accommodate individual differences [5]. The utility of this aptitude construct resides primarily in its predictive capacity for learner success, secondarily in identifying potential challenges, reflecting a static, outcome-oriented view of language aptitude. In contrast, Robinson articulates a framework emphasizing language aptitude as dynamic cognitive processes engaged during information processing across L2 learning contexts and developmental stages [6]. This perspective posits that language aptitude is dynamic, evolving in response to environmental demands. Robinson's framework highlights the malleability of aptitude, shaped by specific learning conditions. Thus, instructional efficacy varies across learners, with optimal outcomes achieved through

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alignment between teaching techniques and individual cognitive profiles. This underscores the need for adaptive instructional strategies tailored to accommodate diverse aptitude configurations. While theoretical perspectives differ on how aptitude influences L2 learning outcomes and mechanisms, as illustrated by the aforementioned models, they converge on a shared premise: language aptitude comprises domain-specific cognitive skills distinct from general intelligence and prior learning experiences [7,8]. These common core tenets of language aptitude served as key inclusion criteria for literature selection. The Modern Language Aptitude Test (MLAT) remains the gold-standard assessment in aptitude research, comprising five subtests evaluating three core constructs: phonetic coding, language analytic ability, and memory. While alternative instruments like PLAB, DLAB, and LLAMA have been developed for specialized purposes, they derive from or reference the MLAT framework and demonstrate comparable predictive validity [3,9] .

A growing body of research highlights the critical role of language aptitude in second language acquisition (SLA) [10-13]. A seminal conceptualization of language aptitude included phonemic coding ability, inductive language learning, grammatical sensitivity, and rote learning [14]. Advances in second language acquisition, educational methodologies, and cognitive psychology have expanded the conceptualization of language aptitude to incorporate factors such as perceptual speed and working memory capacity [8]. This expanded perspective on language aptitude recognizes that individuals may demonstrate strengths in specific aptitude dimensions while underperforming in others. Furthermore, it hypothesizes that distinct aptitude components assume varying degrees of salience across language development stages and instructional contexts [15,16]. This expanded perspective on language aptitude opens avenues for innovative research, offering critical insights for both SLA theorists and practitioners.

To deepen understanding of aptitude's role in language learning, SLA research has increasingly focused on investigating how these cognitive skills — especially language analytic ability — shape L2 learning processes [17-20]. Substantial experimental evidence from controlled laboratory settings has established language aptitude as a critical factor in L2 grammar acquisition [21]. These studies demonstrate that individual differences in language aptitude interact significantly with instructional conditions, resulting in divergent L2 acquisition outcomes. Cumulative evidence highlights a particularly significant role for aptitude in explicit learning contexts where learners engage in intentional pattern identification, hypothesis testing, and strategic problem-solving — key features of form-focused instructional approaches [22-24]. However, Robinson found a significant correlation between language aptitude and learner performance under intentional learning conditions, whereas working memory demonstrated stronger associations with outcomes in incidental learning contexts [16]. This observation, alongside insights from aptitude-treatment interaction research, prompted Robinson to advance a nuanced perspective: traditional aptitude measures exhibit greater predictive validity in explicit learning scenarios but may lack utility for implicit or incidental learning. Consequently, he recommended incorporating supplementary measures like working memory to comprehensively assess learning potential across diverse instructional contexts [25,26].

Past studies focusing on explicit instruction have consistently shown that it tends to be more effective and advantageous compared to approaches that are less explicit [27,28]. However, research has also documented limitations of explicit learning, such as transient learning gains [29,30], no beneficial effect when practice is task-essential [31,32], and variable effectiveness depending on type of grammatical structure [33,34], timing of explicit instruction, and ID in cognitive aptitudes [6,30,35,36]. Thus, exploring the interaction between language aptitude and instructional approaches can offer critical insights into the controversial efficacy and inconsistent findings of teaching strategies, particularly regarding explicit and implicit instruction.

The review aimed to synthesize the extant literature to offer a comprehensive understanding of how instructional approaches interact with language aptitude in L2 grammar acquisition. By illuminating the nuanced interaction effects, this synthesis advances SLA

scholarship by providing evidence-based insights into optimizing instructional strategies to accommodate diverse aptitude profiles. This contributes to developing adaptive teaching methods that address the varied needs of learners in L2 grammar acquisition. Guided by this overarching objective, the study sought to answer the following research questions:

RQ1: What are the existing studies that investigate the role of language aptitude in second language grammar acquisition, particularly in the context of various instructional approaches?

RQ2: Based on these studies, is there an association between language aptitude and the performance of second language grammar acquisition?

RQ3: If a significant relationship is found, is the effect of language aptitude influenced by instructions? What's the interplay between language aptitude and instructional approaches in L2 grammar acquisition?

The first research question (RQ1) aimed to map the landscape of current research, identifying the components of language aptitude that have been investigated and the category of main instructional approaches. Subsequent questions (RQ2 and RQ3) delved deeper, exploring the relationship between the language aptitude and L2 grammar performance and the aptitude-treatment interaction effect. This analysis is crucial for understanding whether certain instructional approaches can enhance or diminish the natural advantages conferred by language aptitude in second language grammar acquisition.

It's important to note that this review specifically addressed broad contexts of second language (L2) learning, intentionally omitting studies involving individuals with language learning disabilities. Such populations may encounter distinct challenges and dynamics in language acquisition that could not reflect the experiences of the general language-learning community.

In summary, this systematic review endeavored to illuminate how language aptitude interacts with various instructional approaches in shaping second language grammar acquisition. By elucidating these relationships, the review aimed to provide insights for developing more effective language teaching strategies, tailored to leverage the strengths of individual language aptitudes.

2. Materials and Methods

This review adhered to the PRISMA protocol guidelines throughout several stages [37].

3. Searching Strategy

A comprehensive literature search was conducted on 8 January 2024 across electronic databases including Web of Science, EBOSCO, PubMed, and ProQuest. No restriction on the publication date was applied to encompass a broad range of studies. The Boolean search strategy employed the following keywords: ("language aptitude" OR "language ability" OR "language capacity" OR "language capability" OR "language competence" OR "cognitive aptitude" OR "language analytic ability" OR "phonetic coding" OR "rote memory") AND ("second language" OR "foreign language" OR "L2") AND ("grammar acquisition" OR "grammar proficiency") AND ("instructional approaches" OR "instruction" OR "instructional treatments" OR "instructional methods" OR "instructional methodology").

4. Inclusion/Exclusion Criteria

Studies were included based on these criteria: (1) The study focused on the grammatical aspects of second language acquisition including both specific grammatical structures and general grammar knowledge and contained the measure data of L2 grammar proficiency; (2) General language aptitude or some single aptitude component was measured through test instruments such as MLAT PLAB, VORD, DLAB, LLAMA, etc.; (3) The study examined the language acquisition under the instructional settings; (4) The study should

be written in English; (5) Full-text was available; (6) Studies were published in peer-reviewed journals to ensure the reliability and validity of the findings; (7) Only empirical research studies, involving the collection and analysis of data, were included.

Studies were excluded if they met these criteria: (1) Studies approached language acquisition from a holistic perspective rather than focusing specifically on the acquisition of second language grammar as the effect of language aptitude on each aspect of second language is different; (2) Studies about the validation of aptitude test instrument, as these studies primarily focused on the development and validation of assessment tools, rather than examining the relationship between language aptitude, second language grammar acquisition, and instructions; (3) Studies involving participants with learning disabilities because of their unique cognitive profiles, which may introduce additional variables and complicate the synthesis of results [38]; (4) Grey literature; (5) Review articles; (6) Books, conference proceedings or dissertation thesis.

5. Study Selection

In the initial stage of the research, a comprehensive search resulted in 446 articles. From this pool, 14 duplicates were removed, leaving 432 studies for title screening. A closer examination of these titles helped identify 133 studies that potentially aligned with the research criteria. The next phase involved a thorough review of abstracts, further narrowing down the pool to 23 articles deemed suitable for full-text analysis. After a detailed evaluation, only nine of these studies fulfilled all the inclusion criteria and were selected for the final review. The entire selection process, including the criteria for inclusion and exclusion at each stage, is detailed in Figure 1 of the study.

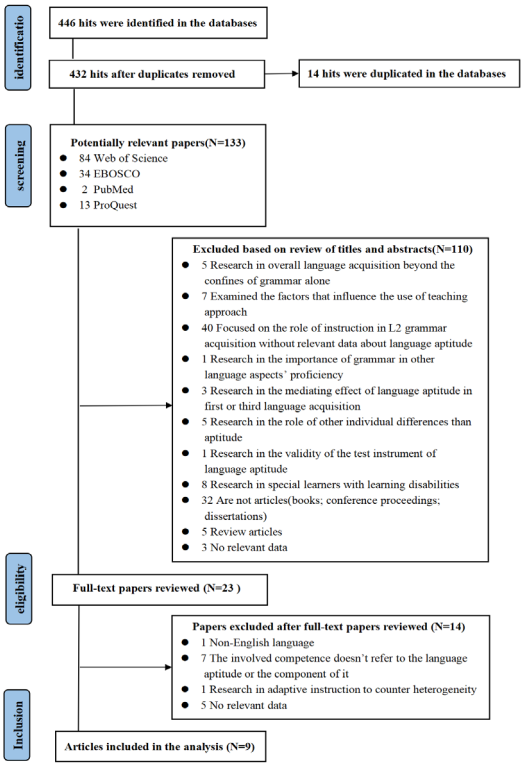

Figure 1. Prisma Flowchart.

6. Results

This systematic review identified a total of nine studies that rigorously examined the relationship between language aptitude and second language grammar acquisition under different instructions which can basically be divided into two category explicit vs. implicit

[1,25,26,39-44]. And the detailed information is shown in Table 1. The summarized results presented below will align with the objectives of this review.

Table 1. Description of reviewed studies.

Author (date)	Location	Design	Size (%F)	Features	Measures	Analysis	Main findings
Hwu et al., 2014	US	Experimental	93 (51)	Native English speakers who enrolled in a first-quarter Spanish course at a public university L1: English L2: Spanish	Aptitude: three group-administered tests (task based on Skehan; Modern Language Aptitude Test (MLAT)) Grammar:a written sentence-production test; a written sentence-correction test	Latent growth curve analysis (LGCA)	language aptitude had a positive effect on both the initial level of performance and the rate of growth; deductive method better matches with low-aptitude learners.
Kachinske and DeKeyser, 2019	US	Experimental	116 (56)	Native English speakers who enrolled in SPAN 103 at a mid-Atlantic university during the Fall 2015 semester L1: English L2: Spanish	Aptitude: LLAMA F; the operation span (OSPAN) WM task Grammar: two comprehension tests; a production test; Grammaticality Judgment Test (GJT)	ANCOVA; correlation; linear regressions	Significant correlations between the LA and the outcome measures; ID measures significantly predicted participants' performance when providing minimal guidance
Kasprowicz et al., 2019	UK	Experimental	113 (47)	Beginner-level learners (aged 8–11) from eight classes across seven primary schools L1: English L2: French	Aptitude: language analytic ability test Grammar: a sentence picture matching test and an acceptability judgement test at pre-, post- and delayed posttest	Spearman's rho; ANOVA	LAA significantly influenced learners' test scores; LAA was associated more strongly with outcomes for the 3.5-day group than for the 7-day group
Kersten et al., 2021	German	Cross-sectional	79 (46)	Fourth grade students in 2	Classroom observation; ELIAS Grammar Test II; German	TIOS; correlational;	Three cognitive skills under scrutiny

				partial immersion schools in Lower Saxony, where all subjects except for German were taught through the L2 English L1: German L2: English	standardized reading and spelling test BAKO 1–4; the standardized WISC-IV; the German school readiness test, BUEGA	multiple regression; moderator analysis	have independent predictive effects on L2 grammar comprehension but none of them moderated the effect of input on grammar comprehension
Li et al., 2019	China	Cross-sectional	150 (n/a)	Eighth-grade English as a foreign language learners at a Chinese middle school L1: Chinese L2: English	Aptitude: language analysis subtest of the PLAB; an operation span test Grammar: Grammaticality Judgment Test (GJT) and an elicited imitation test (EIT)	One-way ANOVA; multiple regression analysis; hierarchical regression analysis	Language analytic ability was significantly predictive of the effects of Task Only and Post-task Feedback, but the significant associations were only found for the GJT, not the EIT
Prela et al., 2022	UK	Cross-sectional	75 (80)	Adult bilinguals who were first generation immigrants with the mean age of arrival to the UK was 27.3 L1: Greek L2: English	Background questionnaire; Aptitude: Sentence Pairs task; Pseudoword Learning task Grammar: Grammaticality Judgement Task (GJT)	Correlation analysis; linear mixed-effects regression analysis	There is a positive relationship between aptitude and proficiency in both the participants' first and second language and the effect of aptitude is not general but component-specific
Suzuki & Dekeyser, 2017	US	Experimental	40 (63)	Beginner-level learners; L1: English, except for two individuals (Nepali and Romanian), who were included in the study because they were	Aptitude: LLAMA F; automated Ospan task Grammar: rule application test; picture sentence completion test	Correlation analysis/ Pearson correlation coefficient	The role of WMC was more important in massed practice, whereas LAA was related to the effectiveness of distributed practice

				highly proficient L2: Japanese			
Tagarelli et al., 2016	US and UK	Experimental	50 (78)	Native speakers of English with no background in German (or any other V2 language) L1: English L2: German	Aptitude: reading span task; (Alternating) serial reaction time task Grammar: Grammaticality Judgment Task (GJT)	Mixed-effects repeated-measures ANOVA; correlation analysis/ Pearson correlation coefficient; stepwise regression	Correlations between cognitive abilities and learning outcomes existed but accounted for little of the variance in overall performance.
Wu & Ionin, 2022	US	Experimental	81 (73)	L1-Mandarin L2-English learners (75% or above accuracy on the filler items in the Picture Acceptability Judgment Task) and 33 English native speakers	Picture acceptability judgment task; Generalization ability test	One-way ANOVA; Cumulative Link Mixed Model in R	Explicit instruction led to learning but not to acquisition, and to a gain of only explicit and not implicit, underlying linguistic knowledge.

The first aim of the current review was to find existing studies that investigate the role of language aptitude in second language grammar acquisition, particularly in the context of various instructional approaches. This was to comprehensively outline the scope of existing literature, pinpointing the various elements of language aptitude that have been explored and categorizing the predominant instructional methods employed in these studies. The included articles were all quantitative studies. Among them, six were experimental studies and three were cross-sectional studies. The studies surveyed a total of 797 second language learners without learning disorders. With regard to aptitude measures, the studies used MLAT [1,39], LLAMA [25.26] and PLAB [42]; additionally, four studies developed their own aptitude tests, in order to address some limitations found in existing measurement tools [40,41,43,44]. And the language analytic ability was the most frequently studied [1,25,26,39,40,42], followed in sequence by working memory [25,26,41-43] and associative or rote memory [1,39]; this is not surprising given that language analytic ability was postulated to be critical for grammar learning and used to test the grammar learning performance. As these nine articles explored different specific grammar structures acquisition, their designing tasks were also various. Of nine articles included, four used grammaticality judgment task (GJT) [1,25,42,43], while some researchers adopted specific grammar tests to measure the participant's knowledge about the targeted structure [25,26,39,40-42,44]. The instructional approaches involved can be mainly divided into two categories. Four studies explored the interaction effect between aptitude

and explicit instruction [1,26,39,40,44], one study focused on the implicit instruction [41] and two studies examined the interaction effect between both explicit and implicit instruction [25,42,43].

Another aim of this review was to examine the relationship between language aptitude and second language grammar acquisition and the influence of varying instructional approaches (RQ2 and RQ3). The results showed that language aptitude had a positive effect on both the initial level of performance and the rate of growth. And there was a stronger association for overall aptitude scores and language analytic ability than other components of language aptitude. Studies also pointed that language aptitude especially the language analytic ability [25,40] and the phonological awareness [41] were the significant predictors of L2 grammar proficiency and correlated significantly with gains in grammar knowledge. A significant ATI effect was also found in these studies. Instructional treatments in these articles were mainly divided into explicit and implicit, the former showed significantly higher correlations with aptitude than the latter for hybrid aptitude measures. Compared to implicit instruction, some researchers pointed that language analytic ability was significant predictors of L2 grammar performance in explicit instruction, but to a lesser degree [25]. While some studies also found that working memory predicted grammar performance only in the explicit but not in the implicit condition [41,43]. To delve into further, the explicit instruction involved deductive and explicit-inductive instruction. Learners of low language aptitude learned significantly better under the deductive condition [39]. While the inductive method, which presumably can lead to better accessibility of information in memory, produced slightly better, but statistically insignificant, performances for learners of higher language aptitude [25,39].

The review underscored the importance of considering individual language aptitudes in the context of instructional method selection. A one-size-fits-all approach was generally found to be less effective than tailored instructional strategies. The need for adaptive teaching methods that cater to the diverse aptitudinal profiles of learners was a recurrent theme across the reviewed literature.

In summary, the results of this review illustrated that language aptitude significantly influences second language grammar acquisition and that its impact is modulated by the type of instructional approach employed. These findings highlighted the need for language instruction that is cognizant of individual differences in language aptitude, advocating for personalized teaching strategies to enhance L2 grammar learning effectively.

7. Discussion

This systematic review examined the relationship between language aptitude and L2 grammar acquisition across instructional methods. The included studies highlighted how language aptitude interacts with teaching approaches to influence grammar learning outcomes. After rigorous screening, only nine studies met the inclusion criteria for analysis. Findings revealed a substantial positive correlation between language aptitude and grammar learning, with differential associations across instructional types: stronger correlations were observed in explicit compared to implicit instruction.

Given the explicit nature of instruction, which harnesses three components of language analytic ability — grammatical sensitivity, deductive reasoning, and inductive learning — learners with higher aptitude were better able to comprehend explicit linguistic information and efficiently apply grammatical rules during practice. This process resulted in superior grammar acquisition outcomes, aligning with prior research demonstrating robust aptitude-explicit instruction correlations [45-47]. Moreover, aptitude components such as language analytic ability are posited to assume greater significance as task complexity increases and imposes greater cognitive demands. Cognitive skills appear particularly advantageous for learners to consciously analyze grammatical patterns, whereas in contexts requiring implicit learning, these skills exert weaker facilitative effects. This aligns with prior research demonstrating differential impacts of cognitive abilities in

structured versus immersive learning environments [48]. Empirical evidence consistently demonstrates a bilingual advantage in phonological awareness — a cognitive skill shown to exert a more significant impact on specific language-related abilities compared to working memory [49-51]. This could also explain why the phonological awareness was found to be a robust predictor.

Language analytic ability, a core component of language aptitude, is critical for rule induction and plays a role in both online and offline tasks requiring rule discovery or metalinguistic processing [52,53]. However, some studies found that the effects of language analytic ability were only observed on the explicit knowledge test but not the implicit knowledge test [42,44]. They posited that this cognitive ability — critical for conscious processing of linguistic material — enhances explicit knowledge acquisition but not implicit learning. This finding aligns with Yalcin and Spada's study, which demonstrated that analytic ability predicted learners' GJT scores but not their oral performance [54], which supposedly tapped implicit knowledge [55].

Explicit instruction provided learners with metalinguistic declarative knowledge precisely when they needed it to solve problems and apply it. A further categorization of explicit instruction into deduction and explicit-induction was warranted due to their prevalence in L2 grammar pedagogy. Therefore, understanding their differential effects on diverse learner profiles is critical for optimizing explicit rule instruction. Results indicated no significant differences in overall performance between deductive and explicit-inductive learning conditions [25,39,44]. These results were consistent with the prediction derived from current evidence from L2 studies, which suggested that grammar learning conditions sharing a comparable level of explicitness will have a similar effect on learning [56-58].

Some studies also examined the role of individual differences on the grammar acquisition performance under instruction with different L2 practice distribution [26,40]. Results indicated that working memory was associated with learning processes under massed practice, whereas language analytic ability played a more significant role in distributed practice. Findings suggested that L2 learners with lower working memory capacity may be more susceptible to interference from overlapping vocabulary and grammatical rules presented in compressed time frames. Interference — rather than temporal decay — appears to account for poor performance in low-working-memory learners under massed practice conditions. Distributed practice, however, involves distinct memory-updating processes during intersession intervals. Longer intervals mitigated interference among similar morphological markers, reducing the sensitivity of distributed practice effectiveness to individual differences in memory-updating functions. For learners with stronger language analytic ability, enhanced comprehension of complex rules likely facilitated deeper structural understanding, enabling greater benefit from spacing effects [46,59].

Implicit instruction entailed acquiring knowledge without explicit guidance or corrective feedback, minimizing reliance on conscious learning mechanisms. Notwithstanding its design to foster meaning-focused implicit learning, certain treatment features may have inadvertently prompted learners to engage in explicit processing. First, the grammatical rules under investigation were salient linguistic structures — meaning-distinctive and form-meaning transparent. Such salience inherently reduces the likelihood of implicit learning, as learners are predisposed to engage in rule-seeking behavior when linguistic targets are perceptually prominent [60]. The second feature pertains to learners' prior educational backgrounds or learning experiences. Having been instructed through traditional grammar-based methodologies, these learners may have been predisposed toward a form-focused, analytic learning style — even when tasked with meaning-oriented activities [1].

Therefore, it is worth pointing out that while implicit instruction is more likely to lead to implicit learning, it may also contribute to explicit learning when the learner engages in conscious processing of available linguistic data; this is especially true of adult

learners who are educated and have some formal language learning experience [61,62]. Participants in implicit instructional treatments were primarily language class students with prior form-focused instruction. Consequently, the involvement of explicit cognitive processes cannot be discounted even in instruction designed to avoid directing attention to linguistic forms. Equally significant, the use of beginner learners may have confounded results, as some participants might not have reached developmental readiness for acquiring target structures. Another limitation was that these studies investigated multiple L2 structures simultaneously rather than focusing on single features in blocked training, potentially mitigating ecological validity and generalizability.

Also, current research on the interplay between implicit instruction and language aptitude is less extensive compared to studies on explicit instruction. Future research should delve deeper into how implicit instructional approaches affect the effect of the language aptitude, exploring diverse linguistic targets and learner profiles to broaden our understanding of unconscious language acquisition mechanisms.

Methodological rigor necessitates that identifying statistically significant differential effects of instructional conditions requires optimal alignment between learning contexts and learner attributes. Despite this, results demonstrated significant interaction effects specifically among low-aptitude learners [39], the future study should consider adjusting experimental designs to better accommodate higher-aptitude learners. For this population, implementing more cognitively demanding tasks or reducing the explicitness level of learning conditions may be necessary to elicit measurable responses to instructional variations. This could involve introducing advanced grammatical structures typically taught at higher proficiency levels or enhancing the complexity of assessment instruments to better capture nuanced aptitude-treatment interactions [63,64].

Collectively, the reviewed studies highlight the central role of language aptitude in L2 grammar acquisition. Core aptitude components — phonetic coding, language analytic ability, and memory, as measured by standardized assessments like the MLAT — are strongly associated with successful grammar learning outcomes. However, this relationship is far from straightforward, as it is moderated by contextual and individual factors. The efficacy of instructional approaches exhibits substantial variability contingent upon learners' specific aptitude profiles. This review underscores the complexity inherent in language aptitude research methodologies, with divergent designs, samples, and treatments reflecting the construct's multidimensionality. For example, naturalistic studies illuminate how age and learning experience interact with aptitude and other individual differences (e.g., anxiety, motivation, learning strategies) [65,66]. This underscores the need to consider multiple interacting factors when examining language aptitude and its impact on L2 learning. Additionally, structural difficulty or complexity moderates the relationship between language aptitude and instructional treatments. Li demonstrated that for simple linguistic structures, the effect of language analytic ability is pronounced even without explicit rule explanation; however, this effect is attenuated when rule explanations are provided. Conversely, for complex structures, analytic ability manifests only when accompanied by rule explanations — facilitating comprehension of intricate grammatical systems — whereas its impact is nonexistent in the absence of guidance, as such structures exceed learners' processing capacity [42,67].

Another limitation of extant research lies in the heterogeneity in measurement tools for language aptitude and instructional methodologies across studies, which may contribute to differential effectiveness outcomes and complicate efforts to derive definitive conclusions about aptitude-grammar learning relationships. Additionally, the overrepresentation of aptitude-treatment interaction (ATI) research in Western contexts raises concerns about generalizability. Future investigations should prioritize standardized measurement protocols and explore this relationship across diverse linguistic and cultural settings. Furthermore, longitudinal studies examining age-related and proficiency-specific aptitude-treatment interactions are warranted, particularly given evidence suggesting that explicit

learning processes in younger learners may be less efficient compared to cognitively mature adolescent/adult populations [68]. Understanding how these dynamics play out in early versus later stages of language acquisition could provide valuable insights for language educators.

8. Conclusion

To summarize, the current review explored the dynamics between language aptitude and second language grammar learning, emphasizing the influence of instructional methods. Analysis of selected studies revealed a significant link between aptitude and grammar acquisition, with a preference for explicit over implicit instructional approaches in enhancing learning outcomes. The review encapsulated the essence of some existing research findings, emphasizing the critical need for personalized language teaching strategies that consider individual differences in language aptitude. The nuanced interaction between language aptitude and instructional approaches suggested that a more tailored approach to language teaching could significantly enhance L2 grammar learning.

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