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THE EFFECT OF TEACHING POLYSEMOUS WORDS IN LITERARY TEXTS ON READING COMPREHENSION AT INTERMEDIATE LEVEL IN DISTRICT KOHAT

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Abstract

Polysemous words are words with more than one related meaning. They often confuse intermediate-level English learners in Pakistan. Classroom instruction is still mostly reliant on the grammar-translation method. This method teaches only one fixed meaning per word and rarely helps students understand how meanings connect and change with context. This gap can limit reading comprehension, especially in literary texts. This study tested a different teaching approach. It used Cognitive-Semantic Theory, based on the idea that word meanings extend from a shared core sense. Sixty second-year intermediate students from public colleges in District Kohat took part. They were divided into two intact groups of thirty. The Experimental group learned polysemous words through their core and extended meanings. The Control group followed the usual translation-based method. Both groups sat a pre-test and post-test, scoring almost identically before teaching began. After one month of instruction, the picture changed. The Experimental group's average rose from 7.63 to 12.87 out of 15. The Control group barely moved, from 7.47 to 8.03. The difference was large and statistically significant ($t(58) = 9.92$, $p < .001$, $d = 2.56$). However, subsequent regression analysis showed that the type of instruction, rather than prior knowledge, was the primary predictor of post-test scores. These findings suggest that teaching word meanings as connected, rather than separate, helps students read literary English more confidently. The study recommends that teachers and textbook designers in Pakistan consider this approach for vocabulary instruction.

1. Introduction

Language serves as the foundation of communication, enabling individuals to construct meaning and interpret complex ideas both in spoken discourse and texts. Among the various linguistic elements that influence comprehension, vocabulary depth, and particularly polysemous word knowledge, play a crucial and unique role (Booton et al., 2022). In cognitive semantics, polysemy, a fundamental concept, is the coexistence of multiple related meanings in a single lexical item (L'Homme, 2024). In second language learning contexts such as Pakistan, English learners often

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focus on memorizing single dictionary meanings, which limits their ability to comprehend texts that depend on the contextual shifting of word senses (González-Fernández & Webb, 2024).

Reading comprehension, similarly, is a complex cognitive process that relies on the integration of linguistic, semantic, and contextual knowledge to infer meaning. Polysemy allows language to be flexible and creative, enabling the same word to convey different meanings depending on context. For example, the word "light" may signify illumination, weightlessness, or paleness, depending on textual surroundings (Sultanova, 2025). Understanding such variations is essential for effective reading comprehension because meaning in discourse is not static; it is dynamically constructed through the interaction between linguistic knowledge and contextual cues (Evans & Green, 2006).

Pakistan's educational system at the intermediate level (grades 11 and 12, the first two years of college) is a critical juncture in students' academic development. At this level, learners are exposed to both literary and non-literary English texts that are linguistically demanding. The English textbooks prescribed by provincial boards contain a substantial number of polysemous words embedded in literary passages. However, classroom instruction in Pakistan predominantly follows a grammar-translation methodology that prioritizes rote memorization, single-definition vocabulary lists, and mechanical repetition rather than contextual and semantic awareness (Anjum & Memon, 2020). As a result, students often struggle to decode the nuanced, layered meanings embedded within reading passages, significantly undermining their overall reading comprehension.

Furthermore, the theoretical framework of this study is based on Cognitive-Semantic Theory (CST), particularly as formulated by Lakoff and Johnson (1980) in their seminal work Metaphors We Live By. CST holds that meaning is fundamentally context-dependent and conceptually structured: words do not carry isolated, fixed meanings but rather activate entire conceptual networks shaped by physical experience, cultural context, and metaphorical extension. Within CST, polysemy is understood as a natural product of metaphorical and metonymic processes through which the core meaning of a word extends to cover related domains. Teaching polysemous words from this theoretical perspective helps students understand how and why words take on multiple related senses, rather than simply listing those senses as disconnected definitions. Image schema theory, closely related to CST, proposes that abstract meanings are grounded in recurring patterns of bodily experience; for instance, the spatial schema of "up" as positive and "down" as negative underlies numerous polysemous expressions in English. Introducing learners to such underlying schemas can greatly enhance their ability to apprehend and remember multiple word meanings across varied contexts.

Consequently, research from diverse ESL and EFL contexts has consistently demonstrated that polysemous word knowledge positively correlates with reading comprehension performance (Logan & Kieffer, 2017; Booton et al., 2022; Chen et al., 2023). Yet, despite this compelling evidence, there is a noticeable absence of empirical research on polysemy-focused vocabulary instruction in Pakistan's ESL context, particularly at the intermediate level. This study, therefore, seeks to fill that gap by investigating whether explicit instruction in polysemous words, delivered through cognitive-semantic and image schema approaches, can significantly improve the reading comprehension of intermediate-level students in District Kohat. District Kohat, located in Khyber Pakhtunkhwa, presents a particularly relevant context for this research: as a

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predominantly Pashto-speaking community where English functions largely as a foreign language, ESL learners in Kohat face unique challenges in acquiring deep vocabulary knowledge.

1.1 Statement of the Problem

Students at the intermediate level in Pakistan demonstrate weak reading comprehension skills, particularly when texts contain polysemous words, even after many years of studying English. Previous empirical studies (Logan & Kieffer, 2017; Booton et al., 2022) have shown a positive correlation between polysemous word knowledge and reading comprehension, whereas traditional vocabulary instruction prioritizes surface-level meanings rather than exploring multiple senses or contextual applications (Liu, 2025; Khuskivadze, 2024). Consequently, students often misinterpret passages or fail to gain a deeper understanding of polysemous words in a text.

Previous studies on vocabulary learning strategies in the Pakistani context focus on rote memorization, dictionary meanings, repetition, and word lists (Mankash et al., 2023; Javed et al., 2024). However, there is limited empirical evidence on instructional emphasis on polysemy from Pakistan's ESL context. This lack of instructional emphasis has created a gap between vocabulary learning and reading comprehension outcomes. This study therefore investigates the effect of explicit polysemous-word instruction, delivered through extended metaphor and image schema, on improving students' reading comprehension at the intermediate level in Kohat.

1.2 Research Questions

- How does the reading comprehension of students taught with polysemous word instruction differ from that of students taught through traditional vocabulary methods?
- How does explicit instruction in polysemous words predict students' reading comprehension at the intermediate level in Kohat?

1.3 Research Objectives

- To compare the reading comprehension performance of students receiving polysemous word instruction with those taught through traditional vocabulary instruction.
- To examine the predictive effect of explicit polysemous word instruction on students' reading comprehension at the intermediate level.

1.4 Significance of the Study

The study is significant on theoretical, pedagogical, and contextual grounds. Theoretically, it builds on existing frameworks of semantics and reading comprehension by empirically investigating how learners' knowledge of polysemous words contributes to contextual meaning construction in an ESL environment. Pedagogically, it provides a practical framework for teaching vocabulary through contextualized, meaning-oriented approaches, encouraging learners to interpret word meanings dynamically rather than memorize single definitions, a perspective supported by recent research emphasizing that depth of vocabulary, particularly polysemous-word understanding, is crucial for reading comprehension (Chen et al., 2023). Contextually, within

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Pakistan's educational landscape, the study addresses students' difficulty in interpreting multiple meanings of words in texts, and its findings are intended to inform curriculum administrators, syllabus designers, and subject experts, promoting a more effective and conceptually oriented ESL pedagogy at the intermediate level.

2. Literature Review

2.1 Polysemy: Conceptual Foundations

Polysemy, a term derived from the Ancient Greek poly- ("many") and sema ("signs" or "meaning"), refers to the linguistic phenomenon in which a single word form carries multiple related meanings. It is one of the most pervasive features of natural language, presenting both a fascinating window into human cognition and a significant challenge for language learners. Unlike homonymy, where identical word forms belong to entirely unrelated semantic domains (e.g., "bank" as a financial institution versus "bank" as the edge of a river), polysemous meanings share a conceptually linked semantic relationship, typically through metaphorical extension, metonymy, or semantic broadening.

Early structural linguists (Saussure, 1916; Bloomfield, 1933; Katz & Fodor, 1963) treated polysemy with a degree of ambivalence; within the Saussurean tradition, the existence of multiple meanings within a single sign complicated the principle of arbitrariness and the stable sign-signified relationship. The advent of cognitive linguistics in the 1970s and 1980s, however, fundamentally reframed polysemy not as an anomaly but as a central, principled phenomenon of language. Cognitive linguists such as Lakoff (1987), Langacker (1987), and Brugman (1988) demonstrated that polysemous meanings are not an arbitrary accumulation but are organized into radial network structures, with a central or prototypical meaning linked to peripheral senses through chains of semantic relatedness.

In literary texts, the focus of this study, polysemy takes on additional complexity and richness. Literary language frequently exploits the semantic flexibility of polysemous words for aesthetic, rhetorical, and thematic purposes; poets and prose writers deliberately choose polysemous words to create layers of meaning, irony, or ambiguity that enrich the reading experience. Consequently, for intermediate-level ESL learners in Pakistan, who may lack both the semantic awareness and the literary-cultural knowledge to navigate these layers, polysemous vocabulary in literary texts represents a particularly prominent comprehension barrier. This study adopts primarily a semasiological orientation (word form to meaning), focusing on how specific polysemous words encountered in literary texts can be taught with attention to their multiple contextual meanings.

2.2 Cognitive-Semantic Theory and Polysemy

Cognitive-Semantic Theory (CST), most prominently articulated by Lakoff and Johnson in Metaphors We Live By (1980), constitutes the primary theoretical foundation for understanding polysemy in this study. CST fundamentally challenges the objectivist, classical view that words have fixed, context-independent meanings fully captured by dictionary definitions. In contrast, CST holds that meaning is embodied, experiential, and conceptually structured; words activate rich, contextually shaped conceptual structures grounded in human bodily experience, cultural knowledge, and imaginative processes. Central to CST is the conceptual metaphor: a systematic

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mapping between a source domain (typically concrete and familiar) and a target domain (typically abstract or less familiar). For example, the conceptual metaphor ARGUMENT IS WAR underlies expressions such as "attack" a position, "defend" an argument, "shoot down" an idea, and claim "victory" in a debate, each extending naturally from the physical domain of warfare to the abstract domain of intellectual dispute.

Image schema theory, correspondingly, developed by Johnson (1987) and elaborated by Evans and Green (2006), proposes that most abstract concepts are structured through recurring patterns of bodily experience, or image schemas, such as CONTAINMENT, PATH, VERTICALITY, and BALANCE. These schemas provide the conceptual basis for many polysemous patterns in English: the CONTAINMENT schema, for instance, explains the various meanings of the preposition in, including physical location (in the room), time (in the morning), emotional or mental states (in love), and ongoing activities (in progress). By helping learners identify such underlying conceptual patterns, instruction enables them to understand how different meanings are systematically related rather than viewing them as separate, unrelated uses, allowing learners to infer and interpret new meanings intuitively instead of relying on rote memorization.

Relevant to the present study, Booton et al. (2022) found that knowledge of multiple word meanings, measured through a polysemy-specific assessment, significantly predicts reading comprehension in children learning English both as a first language and as an additional language, supporting the theoretical claim that vocabulary depth, specifically in the dimension of polysemous meaning knowledge, is a significant predictor of comprehension success. González-Fernández and Webb (2024), examining how well primary and secondary meanings of L2 words are acquired, found that learners predominantly acquire the most frequent or first-encountered meaning of a word and rarely attain knowledge of secondary polysemous senses without explicit instruction, implying that secondary polysemous meanings will not be reliably acquired through exposure alone within typical instructional timeframes.

2.2.1 Vocabulary Depth and Reading Comprehension

Early correlational studies concluded that vocabulary size significantly predicts reading comprehension performance (Nagy & Herman, 1987); however, subsequent research found that vocabulary breadth alone is insufficient to fully explain comprehension differences among learners, and that vocabulary depth (the richness and quality of word knowledge) plays an equally important, and arguably more nuanced, role. Schmitt (2019) articulates a comprehensive framework for the multidimensional nature of vocabulary knowledge, encompassing form, grammatical, collocational, semantic, pragmatic, and discourse knowledge; knowledge of polysemous words falls primarily within the semantic domain but intersects with contextual and pragmatic knowledge, so recognizing the appropriate polysemous sense of a word requires sensitivity to both semantic and contextual cues.

Liu (2025) identified polysemy, phonetics, and idioms as three primary sources of challenge in English text reading comprehension, with polysemy emerging as particularly problematic because learners frequently misinterpret passages when they apply the wrong sense of a key word. Logan and Kieffer (2017) investigated the role of polysemous word knowledge in reading comprehension among bilingual adolescents and found that polysemy knowledge predicted

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reading comprehension even after controlling for vocabulary size and morphological awareness, indicating that polysemy constitutes a distinct and important dimension of vocabulary knowledge with implications for reading comprehension beyond general vocabulary size measures. Khuskivadze (2024) found that learners tend to consult dictionaries only for the first listed meaning of a word rather than searching for context-appropriate polysemous senses, a habit that frequently leads to comprehension errors, and concluded that explicit instruction in polysemy, rather than dictionary consultation alone, is necessary for accurate reading comprehension. Together, these studies provide direct empirical support for the pedagogical approach adopted in the present study.

2.2.2 Polysemous Word Instruction in L2 Contexts

Polysemy is often overlooked by vocabulary instructors and curricula. Traditional L2 vocabulary instruction naturally defaults to word-to-word translation because instructors are often unaware of a word's polysemic nature, while communicative language teaching, though shifting focus toward meaningful input and interaction, has largely overlooked the distinct nature of polysemous words. Cognitive linguistic approaches to vocabulary instruction seek to address this gap. Boers and Lindstromberg (2008), in an influential review, argued that cognitive linguistic approaches, particularly those involving conceptual metaphors, image schemas, and polysemous semantic networks, have the potential to improve L2 vocabulary acquisition by helping learners understand the logically connected, systematically structured nature of polysemous vocabulary, transforming vocabulary learning from rote memorization into a meaningful process of meaning construction.

Lin (2021), in a study of metaphor analysis and middle school English vocabulary acquisition, found that a metaphor-based approach to teaching polysemous words significantly improved vocabulary acquisition compared to a traditional approach; teaching students to recognize a word's core meaning and connect it to extended senses through metaphorical logic produced greater retention of multiple word meanings and enhanced learners' ability to correctly infer the meanings of new polysemous uses of familiar words. Research from East Asian EFL contexts has similarly found that teaching vocabulary through conceptual metaphor and semantic network approaches produces superior learning outcomes compared to traditional definition-based instruction, including improved retention, greater contextual accuracy, and enhanced reading comprehension. This pedagogical principle is central to the instructional intervention designed for the present study, which centers on the instruction of polysemous vocabulary within literary texts, a context where the aesthetic and rhetorical use of polysemy increases comprehension complexity, but where rich contextual cues, from developed characters, description, and thematic coherence, provide valuable support for interpreting polysemous vocabulary.

2.2.3 Reading Comprehension in ESL: Research Perspectives

The theoretical foundations of ESL reading comprehension research draw on bottom-up, top-down, and interactive processing models (Suraprajit, 2019). Bottom-up models emphasize decoding skills, constructing meaning from letters and words upward to phrases, clauses, and larger units; top-down models emphasize background knowledge, schemata, and higher-order inferential processes guiding comprehension from the reader's expectations downward to specific

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linguistic details; interactive models, which have achieved the greatest empirical support, posit that proficient reading involves the simultaneous, mutually interactive deployment of both processes.

Within this interactive framework, vocabulary knowledge holds a critical intermediate position, functioning as a bridge between the bottom-up processes of word recognition and the top-down processes of schema activation and inferential reasoning. A learner who misinterprets the sense of a polysemous word does not merely fail to understand that word; the error derails overall reading comprehension. Evans and Green (2006) emphasize that meaning in discourse is dynamically constructed depending on how words are used in real situations, a claim particularly relevant to polysemous vocabulary, where selecting the appropriate word sense is contextually dependent. Research on the vocabulary threshold for reading comprehension (Laufer & Ravenhorst-Kalovski, 2010) shows that full comprehension typically requires knowledge of 95-98% of the words in a text; even adequate vocabulary breadth may be insufficient if a text contains a significant proportion of polysemous words used in extended or figurative senses.

Research on Pakistani students' performance in understanding English texts shows a concerning pattern. Anjum and Memon (2020) documented the dominance of rote memorization and grammar-translation approaches in Pakistani ESL classrooms, finding that these approaches produced students with reasonable grammar knowledge but poor contextual reading comprehension. Javed et al. (2024) similarly found that rote memorization was the most commonly used vocabulary learning strategy at the secondary level, with deep processing strategies such as semantic network exploration or contextual analysis rarely employed, while Mankash et al. (2023), investigating ESL undergraduate learners in Karachi, found similar patterns of surface-level strategy use even at the university level. Together, these findings suggest that the shallow vocabulary knowledge identified at the intermediate level in Kohat reflects systemic patterns in Pakistani ESL education.

2.3 Vocabulary Instruction in Pakistani ESL Classrooms

The consistent finding across studies of vocabulary instruction in Pakistan is that teaching is characterized by traditional, form-focused approaches that prioritize the memorization of word lists with Urdu translations and decontextualized definitions. While such approaches can support short-term examination success, they fail to develop the deep, contextualized vocabulary knowledge necessary for long-term reading comprehension and language proficiency. Anjum and Memon (2020) found that language instructors mainly relied on direct Urdu translation and simple word-meaning quizzes, with little attention to contextual use or multiple meanings of polysemous words, attributing this to teachers' own limited English proficiency, examination pressure to focus on memorization, and a lack of professional training opportunities.

Javed et al. (2024) found that both students and teachers viewed rote memorization as the most reliable vocabulary learning strategy, a perception shaped by an examination culture that frequently tests vocabulary through direct translation or rote memorization, and by a lack of awareness of cognitively richer alternatives; this approach undermines students' ability to use vocabulary flexibly and contextually, a skill essential for reading comprehension. Mankash et al. (2023) found that Pakistani ESL learners at the university level relied mainly on rote repetition, word-list memorization, and dictionary consultation, with strategies involving semantic analysis,

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contextual inference, or metaphorical reasoning rarely reported, and concluded that without explicit instruction in such strategies, learners default to surface-level memorization regardless of educational level. Sherazi et al. (2025), using a corpus-based approach, found that vocabulary learning activities in Pakistani English textbooks are heavily oriented toward matching a word to a single definition, without systematically developing contextual or multi-sense vocabulary knowledge.

Notably, none of these studies specifically investigated polysemy-focused instruction or its effects on reading comprehension. While the existing literature on Pakistani ESL vocabulary instruction documents the dominance of rote learning approaches, it has not empirically tested whether alternative approaches specifically targeting polysemous vocabulary can produce better comprehension outcomes. The present study addresses this gap and, to the best of the researcher's knowledge, is the first experimental investigation of how teaching polysemous words affects the reading skills of intermediate college students in the Kohat district.

2.4 Image Schema and Metaphorical Extension in Teaching

This section highlights the specific pedagogical tools employed in the instructional intervention: image schema instruction and metaphorical extension analysis. Both are derived from the cognitive linguistic framework discussed above, but take on specific instructional forms in the classroom. Image schema instruction helps ESL Learners Bridge the gap between concrete physical experiences, such as containment, verticality, and paths, and abstract language; by having students physically simulate or visualize a schema before introducing vocabulary, educator's ground language in bodily experience. For instance, experiencing the physical boundaries of containment helps students intuitively grasp why "in" applies equally to spatial locations ("in a box"), emotional states ("in a panic"), and temporal contexts ("in the evening").

Morimoto and Loewen (2007) argue that image schemas are a powerful way to learn foreign vocabulary because they strip away messy sentence context to reveal the core visual idea, show the logical map of how a word's different meanings grow from its original definition, reduce reliance on translation into the learner's native language, and force deeper cognitive processing that creates lasting memories. Kövecses and Szabó (1996) demonstrated that teaching English phrasal verbs through their underlying image schemas produced significantly better retention and usage accuracy than a conventional translation approach; learners who understood the schematic logic underlying expressions like "give up," "give in," and "give away" could distinguish and use them more accurately in new contexts than learners who had memorized translations.

Applying these approaches within literary texts, as in the present study, carries additional pedagogical value. Literary texts provide rich, contextually embedded examples of polysemous usage that give image schema and metaphorical extension instruction immediate relevance and motivational salience: when learners discover that a polysemous word in a poem or prose passage makes richer sense through an understanding of its underlying schema or metaphorical extension, the learning experience becomes both cognitively enriched and personally meaningful.

3. Methodology

3.1 Theoretical Framework

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The theoretical foundation of this study is mainly based on the work of George Lakoff and Mark Johnson (1980, 1987), who proposed that language reflects the way people organize knowledge in their minds and that word meanings are motivated by conceptual structures rather than being arbitrary collections of definitions. Later scholars, including Dirk Geeraerts (2010), Vyvyan Evans (2009), and Andrea Tyler and Vyvyan Evans (2003), further explained how cognitive semantic principles can improve vocabulary learning and second language teaching. A key concept is the prototype principle, according to which a polysemous word usually has one central, prototypical meaning from which other meanings develop through extension, comparison, and abstraction; rather than learning every meaning as a separate vocabulary item, learners can understand how meanings are related, which makes vocabulary learning more meaningful and reduces the burden of memorization.

A second supporting theory is Image Schema Theory, which holds that recurring mental patterns developed through everyday physical experiences, such as movement, balance, containment, and direction, shape the way people understand abstract concepts and language. People naturally understand expressions such as "going into trouble," "coming out of depression," or "moving forward in life" because they relate these to physical experiences of movement and space; recognizing these underlying patterns helps learners better understand the extended meanings of polysemous words in different contexts. The study also draws on Conceptual Metaphor Theory (Lakoff & Johnson, 1980), which explains that many abstract meanings are understood through familiar physical experiences, as in expressions such as "time is money," "high hopes," or "falling into depression."

Together, these three theories explain how learners process the meanings of polysemous words: Cognitive-Semantic Theory establishes that multiple meanings are systematically related rather than random; Image Schema Theory explains the mental patterns that organize these meanings; and Conceptual Metaphor Theory explains how many extended meanings develop through metaphorical thinking. The instructional intervention used in this study is directly based on these principles: students are guided to identify the central meaning of a polysemous word, explore its related meanings in literary texts, and understand how context influences meaning, rather than translating each meaning into the first language or memorizing separate definitions.

3.2 Research Design

The study adopts a quasi-experimental, quantitative research approach because it seeks to measure changes in students' performance numerically and to determine whether the instructional intervention produces statistically meaningful differences (Creswell, 2014). Quantitative data were obtained from students' scores on a 15-item polysemous-word and reading-comprehension test administered before and after the instructional intervention. The independent variable is the instructional approach, and the dependent variable is students' performance on the test, which measures students' ability to identify the intended meaning of a word from its literary or contextual use.

The study employs a quasi-experimental pre-test/post-test control-group design, appropriate for classroom-based research in which participants are drawn from naturally existing classes rather than individually randomized (Fraenkel & Wallen, 2009). Two intact classes participated: one served as the experimental group and the other as the control group. The experimental group

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received explicit instruction in polysemous words through a cognitive-semantic approach for one month, emphasizing contextual meaning, semantic relationships among related senses, metaphorical extension, and image schemas; the control group continued to receive conventional vocabulary instruction during the same period. Both groups completed the same 15-item test before and after the intervention.

3.3 Setting and Population

The study was conducted at the intermediate level in District Kohat, Khyber Pakhtunkhwa, Pakistan, with participants drawn from second-year students at a public-sector college. The accessible population comprised two intact classes. This setting is appropriate because students at this level engage with literary English texts in which familiar words may occur with less familiar or extended meanings, and because local vocabulary instruction often emphasizes direct meanings, translation, memorization, and repetition (Anjum & Memon, 2020).

3.4 Sample and Sampling Technique

A convenience sampling technique was used to select the participating institution and intact classes, an approach appropriate given that access to institutions and existing classes requires institutional permission and practical considerations, and that random assignment of individual students is not feasible in a natural classroom setting (Fraenkel & Wallen, 2009). Two intact second-year classes were selected, one assigned to the experimental group and the other to the control group, with 30 students in each, giving a total sample of 60 students (N = 60). The experimental group received explicit cognitive-semantic instruction in polysemous words, while the control group received traditional vocabulary instruction; both groups completed the same 15-item test before and after the instructional period. Only students who completed both the pre-test and post-test and who participated sufficiently in the instructional intervention were included in the final analysis.

3.5 Data Collection Procedure

Institutional permission was obtained from the relevant authorities before data collection began, and the purpose and procedures of the study were explained to the concerned administration. One class was assigned to the experimental group and the other to the control group, each consisting of 30 students. Before the intervention began, the 15-item polysemous-word test was administered to both groups as a pre-test, establishing participants' baseline reading comprehension and ability to identify polysemous word meanings in context. Following the pre-test, the one-month instructional intervention began, with the experimental group receiving cognitive-semantic instruction and the control group receiving traditional instruction. At the completion of the one-month instructional period, the same 15-item test was administered as a post-test under comparable conditions to ensure consistency. Responses were scored using an objective scoring procedure, with each participant receiving a total score ranging from 0 to 15; scores were coded and entered into SPSS using numerical identification codes rather than participant names.

3.6 Pilot Testing

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Prior to the main study, the 15-item test was reviewed and pilot-tested with a small sample of students (N = 15) who shared similar language and educational backgrounds to the target population but were not included in the final sample. The pilot evaluated the clarity of instructions, item difficulty, distractor plausibility, and overall completion time, consistent with the recommendation that an instrument be piloted with a small, comparable sample before full administration to establish item clarity and reliability (Creswell, 2014). Based on the pilot analysis, ambiguous or poorly functioning items were revised to ensure the instrument's overall validity and reliability before full data collection began.

3.7 Data Analysis

Quantitative data were analyzed in SPSS using both descriptive and inferential statistics. Descriptive statistics, including mean, standard deviation, minimum, and maximum scores, were calculated for the pre-test and post-test scores of both groups. A paired-samples t-test was used to examine whether there was a statistically significant difference between the pre-test and post-test scores within each group (Shapiro & Wilk, 1965), and an independent-samples t-test was used to compare the performance of the experimental and control groups at pre-test and post-test (Fraenkel & Wallen, 2009). Effect sizes (Cohen's d) were reported to indicate the magnitude of the intervention's effect. As a supplementary analysis, a multiple regression analysis was conducted to examine whether group membership predicted post-test performance, with pre-test performance included as a covariate to control for baseline differences (Creswell, 2014).

4. Results

To determine the efficacy of explicit polysemy instruction compared to traditional vocabulary teaching, a quasi-experimental pre-test/post-test design was used involving sixty (N = 60) intermediate-level students, allocated into an Experimental Group (n = 30), which received explicit, cognitive-linguistically grounded instruction focusing on core senses, metaphoric extensions, and sense-disambiguation strategies, and a Control Group (n = 30), which received standard, non-targeted vocabulary instruction following the standard curriculum.

4.1 Descriptive Statistics

Descriptive statistics were calculated for the pre-test, post-test, and calculated gain scores (Gain = Post-test − Pre-test) across both conditions and the combined sample (N = 60). Test scores ranged from a minimum possible score of 0 to a maximum of 15.

Table 1. Descriptive Statistics for Pre-Test, Post-Test, and Gain Scores by Group

Group	Variable	N	M	SD	SE	Min	Max
Overall	Pre-test	60	7.55	2.40	0.31	3	13
	Post-test	60	10.45	3.07	0.40	3	15
	Gain score	60	2.90	3.67	0.47	-5	9
Experimental	Pre-test	30	7.63	2.30	0.42	4	13

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Group	Variable	N	M	SD	SE	Min	Max
	Post-test	30	12.87	1.48	0.27	9	15
	Gain score	30	5.23	2.46	0.45	-1	9
Control	Pre-test	30	7.47	2.54	0.46	3	13
	Post-test	30	8.03	2.22	0.41	3	12
	Gain score	30	0.57	3.17	0.58	-5	7

Note. Scores range from 0 to 15. Gain score = Post-test minus Pre-test.

As summarized in Table 1, before instruction began the baseline scores across both groups were closely aligned: the Experimental group (M = 7.63, SD = 2.30) and Control group (M = 7.47, SD = 2.54) showed an initial mean difference of only 0.16 points, confirming baseline equivalence. Following the instructional period, the Experimental group showed a marked increase in mean post-test scores (M = 12.87, SD = 1.48), resulting in a mean gain of +5.23 points (SD = 2.46), whereas the Control group yielded a post-test mean of 8.03 (SD = 2.22) and an average gain of only +0.57 points (SD = 3.17).

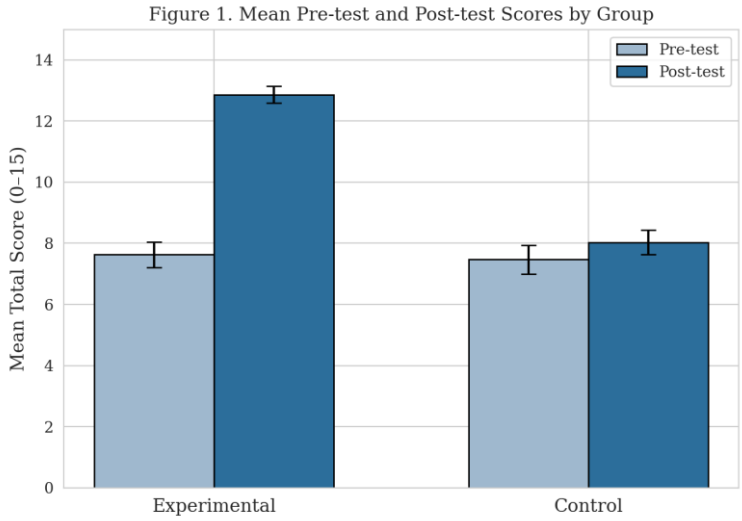

Figure 1. Mean pre-test and post-test scores by group, with standard error bars.

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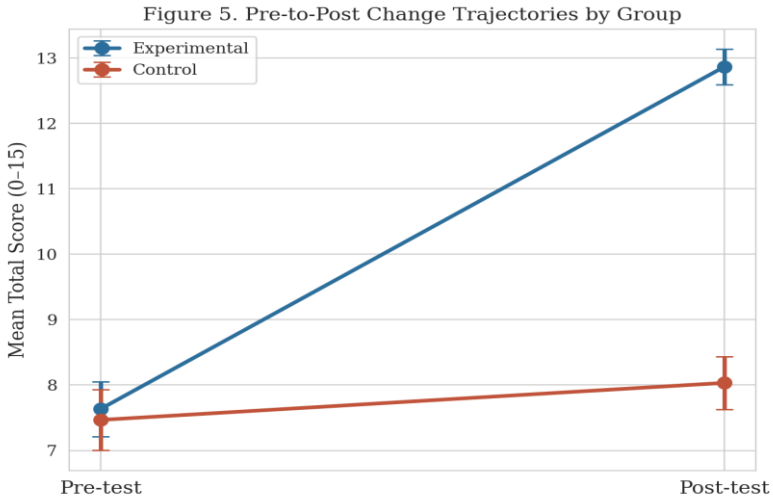

Figure 2. Pre-to-post change trajectories for the Experimental and Control groups.

4.2 Assumption Testing (Normality and Homogeneity)

To verify whether parametric inferential tests (t-tests and linear regression) were statistically appropriate, distributional normality was assessed using the Shapiro-Wilk (W) test (Shapiro & Wilk, 1965).

Table 2. Shapiro-Wilk Test of Normality Across Study Variables

Variable	W	p	Interpretation
Pre-test (overall)	0.960	.047	Deviates from normality (p < .05)
Post-test (overall)	0.942	.007	Deviates from normality (p < .05)
Gain (overall)	0.955	.028	Deviates from normality (p < .05)
Post-test (Experimental)	0.888	.004	Deviates from normality (p < .05)
Post-test (Control)	0.956	.245	Approximately normal (p > .05)
Gain (Experimental)	0.940	.091	Approximately normal (p > .05)
Gain (Control)	0.955	.233	Approximately normal (p > .05)

As detailed in Table 2, several distributions exhibited statistically significant departures from a theoretical bell curve ($p < .05$), most notably the post-test distribution of the Experimental group ($W = 0.888$, $p = .004$). This departure is attributable to a ceiling effect: following the targeted instruction, a large proportion of Experimental participants achieved scores near the maximum ceiling (14-15 out of 15), skewing the distribution negatively.

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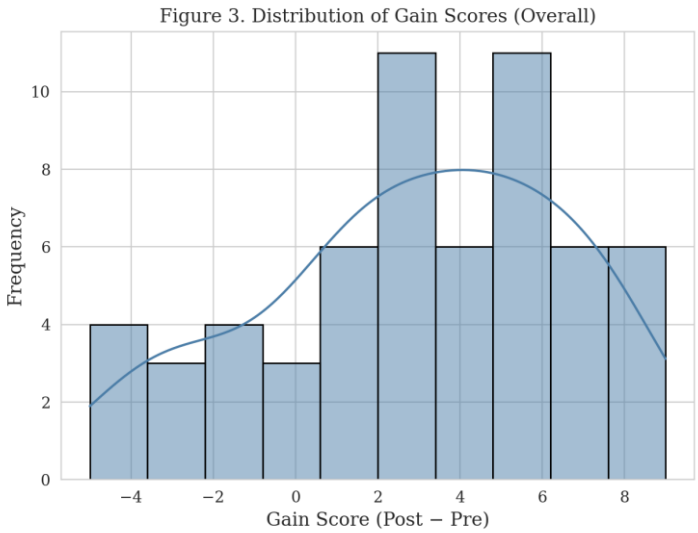

Figure 3. Distribution of gain scores (Post-test − Pre-test) for the full sample.

Despite these departures, parametric procedures were retained for three reasons. First, t-tests remain robust against moderate departures from normality when equal group sample sizes reach or exceed n = 30 per group. Second, Levene's Test for Equality of Variances yielded non-significant results across all comparisons - pre-test, $F(1, 58) = 0.81$, $p = .371$; post-test, $F(1, 58) = 3.42$, $p = .070$; gain score, $F(1, 58) = 1.95$, $p = .168$ - confirming equal population variances between conditions. Third, retaining parametric measures allows standardized comparisons (e.g., Cohen's d, R^2) consistent with published literature in applied linguistics.

4.3 Between-Group Inferential Analysis: Independent-Samples t-Test

An independent-samples t-test was conducted to examine between-group differences at pre-test (baseline equivalence), post-test, and across calculated net gain scores.

Table 3. Independent-Samples t-Test Results Comparing Experimental and Control Groups

Comparison	M (SD) Exp / Ctrl	t	df	p	Mean Diff.	d
Pre-test (Baseline)	7.63 (2.30) / 7.47 (2.54)	0.27	58	.791	0.17	0.07
Post-test	12.87 (1.48) / 8.03 (2.22)	9.92	58	< .001	4.83	2.56
Gain Score	5.23 (2.46) / 0.57 (3.17)	6.37	58	< .001	4.67	1.65

Note. Positive mean differences favor the Experimental group.

At baseline, the pre-test difference between groups was statistically non-significant, $t(58) = 0.27$, $p = .791$, $d = 0.07$, confirming initial group equivalence. At post-test, the Experimental group scored significantly higher than the Control group, $t(58) = 9.92$, $p < .001$, $d = 2.56$. The gain-

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score comparison further revealed a statistically significant difference in improvement favoring the Experimental group, $t(58) = 6.37$, $p < .001$, $d = 1.65$.

Figure 2. Distribution of Post-test Scores by Group

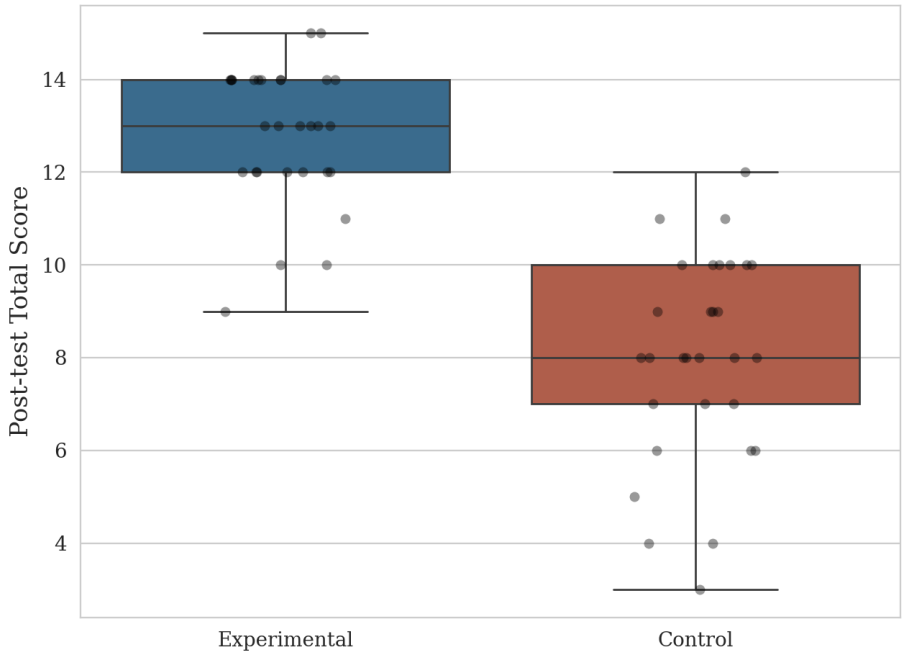

Figure 4. Boxplot of post-test scores by group, with individual data points overlaid.

4.4 Within-Group Inferential Analysis: Paired-Samples t-Test

Paired-samples t-tests were computed to measure individual score changes within each group over time.

Table 4. Paired-Samples t-Test Results (Pre-Test vs. Post-Test)

Sample	Pre M (SD)	Post M (SD)	Mean Diff.	t	df	p	d
Full Sample (N=60)	7.55 (2.40)	10.45 (3.07)	2.90	6.13	59	< .001	0.79
Experimental (n=30)	7.63 (2.30)	12.87 (1.48)	5.23	11.66	29	< .001	2.13
Control (n=30)	7.47 (2.54)	8.03 (2.22)	0.57	0.98	29	.336	0.18

The Experimental group exhibited a statistically significant mean gain of +5.23 points, $t(29) = 11.66$, $p < .001$, $d = 2.13$. Conversely, the Control group's pre-to-post change of +0.57 points was statistically non-significant, $t(29) = 0.98$, $p = .336$, $d = 0.18$, indicating that conventional instruction yielded minimal progress in resolving polysemous ambiguity.

4.5 Explanatory Regression Model

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A multiple linear regression analysis was conducted to evaluate the relative contribution of prior knowledge (pre-test) and instructional condition (group) in predicting post-test performance.

Table 5. Multiple Regression Analysis Predicting Post-Test Score

Predictor	B	SE B	β	t	p
(Constant)	7.15	0.84	—	8.57	< .001
Pre-test Score	0.12	0.10	0.09	1.15	.253
Group (1 = Exp)	4.81	0.49	0.79	9.90	< .001

Note. $R^2 = .638$, *Adjusted* $R^2 = .625$, $F(2, 57) = 50.18$, $p < .001$, *SEE = 1.88.*

The model explained approximately 63.8% of the variance in post-test scores, $F(2, 57) = 50.18$, $p < .001$. Group assignment was a strong, statistically significant predictor ($\beta = 0.79$, $t = 9.90$, $p < .001$), whereas baseline pre-test knowledge did not significantly predict post-test performance once group assignment was controlled ($\beta = 0.09$, $t = 1.15$, $p = .253$).

Figure 4. Relationship between Pre-test and Post-test Scores

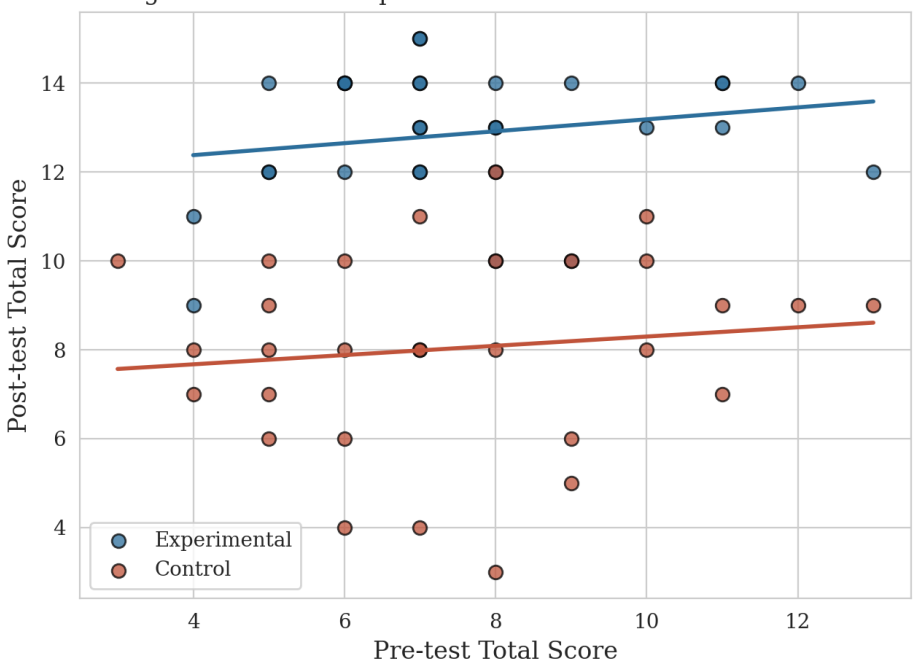

Figure 5. Scatterplot of pre-test and post-test scores with fitted regression lines for each group.

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4.6 Qualitative Analysis of Individual Participant Responses

Alongside the overall statistical data, test papers were analyzed qualitatively to inspect individual learning processes. This section examines the responses of three students (two Control, one Experimental) to illustrate how the two forms of instruction differed in their effect on students' ability to comprehend a word's different senses.

Case 1: Participant E-04 (Experimental Group - Low Pre-test, High Post-test)

Pre-test score: 5/15; Post-test score: 14/15; Gain: +9. Item analyzed - target word FIELD, in the phrase "in every field of life." On the pre-test, E-04 selected the literal option ("an area of land used for farming"), writing that "field means a grassy land or farm. Here it means living on land." On the post-test, E-04 correctly selected "an area or sphere of activity," writing that "here 'field' does not mean physical ground or a farm. It is an extended sense meaning a domain, area, or sphere of human activity." E-04 initially displayed a prototype-sense bias, forcing the primary, physical spatial sense of field onto an abstract context; post-intervention, E-04 successfully applied cognitive mapping to recognize domain extensions, moving from a concrete physical prototype to an abstract figurative sense.

Case 2: Participant C-11 (Control Group - Average Pre-test, Low Post-test)

Pre-test score: 7/15; Post-test score: 7/15; Gain: 0. Item analyzed - target word BINDS, in the phrase "she cuts and binds the grain." On both the pre-test and post-test, C-11 selected the correct option ("ties or gathers something together"), writing on the pre-test that "binds means tying. She holds the wheat," and on the post-test that "binds means to tie things together. She gathers grain." C-11 retained a vague intuition of the word's literal sense in context but lacked structural precision, failing to articulate the semantic distinction between the physical action of binding objects and its broader metaphorical or legal senses (such as obligation or control) due to the absence of targeted explicit instruction.

Case 3: Participant C-27 (Control Group - High Pre-test, Regressed Post-test)

Pre-test score: 10/15; Post-test score: 8/15; Gain: -2. Item analyzed - target word TREAT, in the phrase "treat those two impostors just the same." On the pre-test, C-27 selected the correct figurative option ("to behave toward or regard in a particular way"), writing that "treat means how you handle or behave with someone, here handling both triumph and disaster equally." On the post-test, C-27 regressed to the literal option ("to provide medical care"), writing that "treat means giving medical help or care to someone." This instability in sense selection, regressing from an accurate figurative interpretation back to a dominant literal sense, illustrates that non-explicit instruction fails to solidify secondary semantic networks and domain-extended meanings in L2 memory structures over time.

5. Discussion

Taken together, the quantitative and qualitative results reported above confirm that explicit polysemy instruction produced significant improvements in L2 vocabulary comprehension, with the Experimental group significantly outperforming the Control group and group assignment

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emerging as the principal predictor of post-test performance. The following subsections situate these results within the broader second language acquisition and cognitive-linguistics literature.

5.1 Explicit Instruction and General Vocabulary-Learning Benchmarks

A substantial body of SLA research supports the general superiority of explicit, intentional vocabulary instruction over incidental or non-targeted exposure. Nation (2001) argued that deliberate, focused learning accelerates learners' progress toward an effective vocabulary size more reliably than incidental exposure alone, a claim validated quantitatively by Yousefi and Biria's (2018) meta-analysis of sixteen primary studies (N = 1,008), which reported an overall effect size of d = 0.80 for L2 vocabulary instruction under a random-effects model, a magnitude conventionally classified as "large" according to Cohen's (1988) benchmarks.

The effect sizes obtained in the present study are considerably larger than the average reported across the general vocabulary-instruction literature. The independent-samples comparison of post-test scores yielded d = 2.56, and the within-group pre-to-post gain for the Experimental group yielded d = 2.13, both more than two-and-a-half times the d = 0.80 benchmark identified by Yousefi and Biria (2018). While consistent with the general claim that explicit instruction outperforms non-targeted teaching, the scale of the advantage observed here is unusually large even by the standards of a literature that already favors explicit approaches. Two possible explanations are the narrowly targeted nature of the intervention (a single, well-defined linguistic phenomenon rather than general vocabulary) and the possibility of practice or test-retest effects inherent to a two-time-point design without a delayed post-test.

5.2 Polysemy-Specific and Cognitive-Linguistic Literature: Points of Convergence

The present findings align closely with a line of research applying cognitive-linguistic principles, particularly conceptual metaphor, image schemas, and the notion of a motivated core-to-extended sense network, to the teaching of polysemous vocabulary. Boers (2000) demonstrated across three EFL experiments that organizing figurative vocabulary around shared metaphoric themes facilitated learners' retention of unfamiliar expressions relative to unorganized presentation, and proposed classroom activities to raise learners' metaphor awareness as an additional channel for vocabulary acquisition. Beréndi, Csábi, and Kövecses (2008) extended this rationale specifically to polysemous items, arguing that explicit teaching of the metaphorical motivation linking a word's core and extended senses facilitates both comprehension and retention, the same theoretical premise underlying the treatment administered to the Experimental group in the present study.

This premise is consistent with Tyler and Evans's (2003) principled polysemy model, which holds that the distinct senses of a lexical item are organized systematically around a primary or core sense, with extended senses linked through motivated, learnable relationships rather than arbitrary listing. The Experimental group's large post-test gain (M = 12.87 out of 15) offers empirical support for the pedagogical value of presenting polysemous senses as a structured, motivated network rather than as isolated dictionary entries. A comparably designed study by Khodadady and Khaghaninizhad (2012), comparing schema-based instruction with translation-based instruction for French polysemous vocabulary, similarly found that the schema-based group outperformed the translation-based group; although the present study's Control group

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received standard, non-targeted instruction rather than translation-based teaching, it plays an analogous methodological role, and the markedly smaller gains it produced reinforce a broader pattern in second language research: cognitive-linguistically informed instruction reliably outperforms traditional approaches that do not make sense-relationships explicit.

5.3 Points of Divergence: Contrasting and Critical Findings

Research in this area has not consistently reported outcomes as favorable to cognitive-linguistics-based instruction as those observed in the present study. Piquer-Píriz and Martín-Gilete's (2024) longitudinal, classroom-based study of Spanish secondary school learners applied cognitive-linguistics-inspired activities to teach the polysemous particles in/out and up/down to an experimental group (n = 81) against a control group (n = 26); despite positive teacher feedback and an apparent increase in learners' awareness of polysemy, the experimental group showed no statistically significant improvement on post-test measures. This null result stands in direct contrast to the large, significant gains observed in the present study, suggesting that the effectiveness of cognitive-linguistics-based polysemy instruction may be moderated by variables such as learner age (secondary school versus college students), the linguistic category targeted (grammaticalized particles versus content-word polysemy), instructional duration, or the sensitivity of the outcome measure.

Reda (2015) offers a more fundamental critique, arguing that the Lakoff-and-Johnson-inspired cognitive-linguistics tradition, on which much polysemy pedagogy is based, focuses narrowly on the conceptual motivation underlying idiomatic and metaphorical expressions, and that this strategy on its own is inadequate to address the contextual variability and complexity of word meaning in use, becoming more useful only when supplemented with constructivist strategies that train learners to attend to contextual meaning directly. Viewed alongside the findings of the present study, Reda's critique is best read as a caution rather than a contradiction: the intervention used here did not rely solely on teaching core meanings or raising metaphor awareness, but also included instruction on metaphorical extensions and sense-disambiguation strategies, components consistent with Reda's recommendations that may help explain why the present study produced more positive results than cognitive-linguistics-based interventions relying primarily on metaphor awareness-raising alone. Taken together, the contrast between the strong findings of the present study and the null results reported by Piquer-Píriz and Martín-Gilete (2024) suggests that cognitive-linguistic instruction is not equally effective in all contexts, and that its effectiveness depends on how explicitly the instruction teaches relationships among different word senses and on learners' age, maturity, and language proficiency, conditions that were more favorable in the present study.

5.4 Situating the Findings within the Pakistani ESL Context

Empirical, quasi-experimental research on vocabulary instruction conducted specifically within Pakistani tertiary ESL settings remains comparatively limited, which increases the value of any available regional benchmark. A recent mixed-methods study on the vocabulary and writing performance of Pakistani ESL students by Saleem, Saleem, and Aslam (2025) investigated the impact of AI-assisted instruction, using tools such as Grammarly and QuillBot. Employing a pre-test/post-test experimental-control design comparable to that of the present study, with 100

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participants (50 in each group) and a 16-week intervention, the researchers found that the experimental group achieved significantly greater vocabulary gains than the control group, with a large effect size (d = 1.12).

The present study yielded a considerably larger between-group post-test effect size (d = 2.56) and within-group effect size (d = 2.13) than the d = 1.12 reported by Saleem et al. (2025). This difference may partly reflect differences in instructional focus and learner population: the present study targeted only fifteen polysemous words with explicit instruction in core senses, metaphorical extensions, and sense-disambiguation strategies among intermediate college students, whereas Saleem et al. (2025) examined AI-assisted instruction aimed at improving the broader constructs of general vocabulary and writing proficiency among undergraduate ESL students, outcomes that may require more time and varied instructional support to produce gains of the same magnitude. The higher gains observed here may also partly reflect differences in test design, since an instrument built specifically around the taught items is naturally more sensitive to a targeted intervention than a general vocabulary measure. Nonetheless, the overall convergence in findings reinforces a growing regional evidence base showing that Pakistani tertiary ESL instruction benefits substantially from moving beyond rote memorization and non-targeted teaching.

6. Conclusion and Recommendations

6.1 Summary of the Findings

This study set out to answer two related questions: whether students taught polysemous words through an explicit, cognitively grounded approach would comprehend literary texts better than students taught through the traditional, translation-heavy method, and whether this kind of instruction could predict how well a student performs on a reading comprehension test. Sixty intermediate-level students from public-sector colleges in Kohat were divided into two intact groups of thirty each. The Experimental group was taught polysemous words through their core senses, metaphorical extensions, and simple strategies for working out which sense of a word is meant in a given sentence, an approach rooted in Cognitive-Semantic Theory (Lakoff & Johnson, 1980) and image schema theory; the Control group continued with the standard method already in use, built largely around single dictionary definitions and rote learning.

Before instruction began, the two groups were almost identical in ability - the Experimental group averaged 7.63 out of 15 on the pre-test and the Control group averaged 7.47, a gap too small to be statistically meaningful ($t(58) = 0.27$, $p = .791$) - so any differences observed at post-test can be attributed more confidently to the instructional intervention than to pre-existing differences between the groups. Once instruction was over, the picture changed considerably: the Experimental group's average jumped to 12.87 out of 15, a gain of just over five marks per student, while the Control group moved only slightly, from 7.47 to 8.03, a gain of about half a mark. The difference between the two groups at post-test was large and statistically significant ($t(58) = 9.92$, $p < .001$), with an unusually strong effect size ($d = 2.56$ for the between-group comparison and $d = 2.13$ within the Experimental group alone). In practical terms, the improvement was not a minor edge but a substantial, easily noticeable jump in how well students could work out the meaning of a word from its context.

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Regression analysis carried out to determine which factor mattered more, prior knowledge or the type of instruction received, showed that group assignment was by far the stronger predictor of post-test performance ($\beta = 0.79$, $p < .001$), while a student's starting score barely mattered once instructional group was taken into account ($\beta = 0.09$, $p = .253$); together, prior knowledge and group membership accounted for close to 64 percent of the variation in post-test scores ($R^2 = .638$). The item-level analysis of individual responses supported these patterns: a student in the Experimental group who had earlier picked the literal, land-based meaning of "field" was, after the intervention, able to correctly identify its extended sense in the phrase "every field of life" and to explain in his own words why the word had shifted from a physical to a figurative meaning. By contrast, two students from the Control group either retained only an incomplete understanding of a word's meaning or, in one case, actually moved backward, choosing the literal sense of "treat" (medical care) after the intervention when they had correctly identified its figurative sense (to behave toward someone) at pre-test, a regression seen only in the Control group that suggests a correct guess does not always hold up over time without deliberate teaching of how word senses connect.

These results answer both research questions clearly: students who received explicit, meaning-based instruction in polysemous words understood literary texts noticeably better than those taught in the conventional way, and the kind of instruction a student received was the single biggest factor in explaining their post-test performance, well ahead of how much they already knew before the study began.

6.2 Conclusion

On the basis of the evidence gathered, it can be concluded that teaching polysemous words through their conceptual links, rather than as a list of separate dictionary meanings, makes a real and measurable difference to how well intermediate-level students in Kohat understand literary texts in English. The gap between the two groups was too large, and too consistent across the statistical tests, quantitative and qualitative alike, to be attributed to chance or to natural variation between students. The findings confirm that the grammar-translation method, with its emphasis on isolated word meanings and mechanical repetition, does not adequately prepare Pakistani ESL students to interpret words with multiple related senses; the Control group's minimal improvement, despite receiving a full term of standard teaching, illustrates this limitation plainly. Where students were taught to see a word's different meanings as branches of the same underlying idea, rather than as unrelated entries to be memorized separately, they were able to transfer that understanding to new sentences they had not seen before, which is, in effect, the whole point of reading comprehension.

It would be an overstatement to claim that this one intervention, involving sixty students in one district, settles the matter for all of Pakistan. Yet the size of the effect, and the fact that it aligns with what similar studies in comparable ESL settings have already reported (Saleem et al., 2025; Khodadady & Khaghaninizhad, 2012), gives reasonable confidence that a cognitively grounded approach to vocabulary teaching is worth taking up in classrooms well beyond Kohat.

6.3 Research Contribution

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This study contributes to the field in several concrete ways. First, it is among the very limited body of empirical, experimentally designed research on polysemy instruction to come out of Pakistan and, as far as the researcher is aware, the first of its kind to be carried out specifically among intermediate-level students; most earlier work from the region, such as Anjum and Memon (2020) and Sherazi et al. (2025), has examined vocabulary size in general, whereas this study looks at vocabulary depth. Second, the study demonstrates that Lakoff and Johnson's (1980) Cognitive-Semantic Theory can be effectively translated into classroom practice, with this conclusion supported by empirical evidence from pre-test and post-test scores rather than opinion or classroom impressions, implemented under normal teaching conditions in a Pakistani intermediate college where it produced substantial improvements in students' understanding of polysemous words. Third, by combining statistical analysis with a closer, item-level look at how individual students answered specific questions, the study offers not just a number showing that the intervention worked, but insight into how it worked, namely by helping students move away from over-relying on a word's most common or prototype meaning and toward recognizing its extended, figurative senses.

6.4 Implications

6.4.1 Implications for Classroom Teaching

The most direct implication of this study is for English teachers themselves. Vocabulary lists that give a single, fixed meaning for each word are, on this evidence, not enough to prepare students for literary texts, where the same word can shift meaning depending on what surrounds it. Teachers could instead spend a small amount of classroom time showing students how a word's core, literal sense connects to its figurative uses, using the kind of simple, everyday examples already found in the intermediate syllabus. This need not be a complicated or time-consuming addition to a lesson; the intervention in this study worked with only fifteen target words taught over a limited period, suggesting that even a modest, well-focused change in how vocabulary is taught can produce a noticeable improvement in comprehension.

6.4.2 Implications for Curriculum and Textbook Design

The findings also have something to say to those who design the English syllabus and textbooks used at the intermediate level in Khyber Pakhtunkhwa and elsewhere in Pakistan. If polysemous words in literary passages are a genuine source of difficulty for students, as this study suggests, then textbooks and teacher guides could flag such words explicitly, perhaps with a short note on their different senses, rather than leaving it entirely to the teacher's own initiative to notice and explain them. Teacher training programs, too, could include a brief module on how word meanings extend and connect, since many English teachers have themselves been educated through the grammar-translation approach and may not have received formal training in cognitive-semantic approaches to vocabulary instruction.

6.5 Limitations and Recommendations for Future Research

The present study has several methodological limitations. It employed a quasi-experimental design using two intact classes selected through convenience sampling, with a sample of 60 intermediate college students drawn from public-sector colleges in one district, which limits the

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generalizability of the findings. It relied exclusively on quantitative data collected through pre-test and post-test scores analyzed using SPSS, without qualitative data on learners' experiences or perceptions of the intervention beyond the item-level analysis reported here. It also did not include a delayed post-test, so it was not possible to examine the long-term retention of polysemous vocabulary; and because core senses, metaphorical extensions, and disambiguation strategies were taught together as a single package, it is not possible to say which of these three elements contributed most to the gains observed.

- A delayed post-test, to determine whether the gains made by the Experimental group hold up over time or fade once the topic is no longer fresh.
- A larger and more varied sample, covering a wider range of institutions and regions, including private institutions and other districts and provinces of Pakistan, to establish how far these results travel.
- Random assignment at the individual level where practically possible, to strengthen internal validity beyond what convenience sampling and intact classes allow.
- Inclusion of qualitative data collected directly from students and teachers, such as interviews or classroom observation, to explain not just whether the intervention worked but how students experienced learning words through their connected senses.

Taken together, these directions would help confirm whether the strong results obtained in this study hold up under different conditions, over a longer period, and with a broader range of Pakistani ESL learners, moving the field closer to a well-tested, classroom-ready model for teaching vocabulary depth alongside vocabulary size.

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