
A Meta-Analysis of Presuppositions by Native and Second Language Speakers

Yuqi Chen¹

Abstract

In recent years, research on second language acquisition has increasingly focused on complex linguistic phenomena that remain difficult for second language learners to fully master, even at advanced proficiency levels. One such phenomenon involves the comprehension and use of pragmatic presuppositions, which require integrating semantic meaning with pragmatic context. Many second language learners experience persistent difficulties in processing linguistic features located at the interface between linguistic domains, particularly the semantic–pragmatic interface. The Semantic–Pragmatic Interface Hypothesis proposes that language phenomena situated at external interfaces are more difficult to acquire than those at internal interfaces. Therefore, this study aims to examine the comprehension and acquisition of pragmatic presuppositions among native and non-native speakers. This study employs a meta-analytic approach, systematically reviewing and synthesizing empirical studies on the processing of pragmatic presuppositions in both native and non-native speakers. The analysis compares reported effect sizes across studies to identify general patterns in the ability to generate and adjust presuppositions during language use. The results indicate that both native and non-native speakers can generate and adjust pragmatic presuppositions in communicative contexts. However, the overall effect size observed for non-native speakers is consistently lower than that for native speakers. This finding suggests a measurable difference in mastery levels between the two groups and provides empirical support for the Semantic–Pragmatic Interface Hypothesis, which predicts greater acquisition difficulty for linguistic phenomena located at external interfaces. This study recommends that second language instruction place greater emphasis on linguistic phenomena at the semantic–pragmatic interface. Future research should further explore pedagogical strategies that facilitate learners' acquisition of complex pragmatic features in second-language learning contexts.

Keywords: *Meta-Analysis, Presuppositions, Second Language Acquisition, Semantic-Pragmatic Interfaces*

A. Introduction

In recent decades, research in second language acquisition (SLA) has increasingly shifted its focus from purely structural aspects of grammar to the interface between linguistic subsystems and broader cognitive-pragmatic mechanisms. A consistent finding in this line of inquiry is that even highly proficient second language (L2) learners—those who have achieved advanced morphosyntactic competence—often continue to exhibit subtle but persistent non-native-like behavior. These residual divergences are not random; rather, they tend to cluster around phenomena that require integration across representational domains. Such observations have motivated the development of the Interface Hypothesis (Sorace, 2005; Sorace & Filiaci,

¹Department of English, College of Foreign Languages, Ocean University of China, No. 238, Songling Road, Laoshan District, Qingdao, Shandong Province, The People's Republic of China, 266100

2006; Sorace, 2011), which seeks to explain differential patterns of attainment across linguistic interfaces.

The Interface Hypothesis (IH) proposes that not all interfaces are equally vulnerable in L2 acquisition. A crucial distinction is drawn between internal interfaces, which involve mappings between components within the grammatical system (e.g., syntax–semantics), and external interfaces, which involve interactions between grammar and other cognitive systems, such as discourse representation, pragmatics, or general inferential reasoning. According to this account, internal interfaces are relatively stable and more likely to reach near-native levels of attainment. External interfaces, by contrast, are predicted to remain vulnerable even in advanced L2 grammars, due to the increased processing demands required to integrate linguistic representations with contextual and pragmatic information.

Empirical work has provided growing evidence in support of the vulnerability of external interfaces (Tsimpili & Sorace, 2006; Valenzuela, 2006). At the same time, other studies have challenged a strong version of the hypothesis by showing that L2 learners may ultimately approximate native performance, albeit sometimes with delayed acquisition or under restricted processing conditions (Destruel & Donaldson, 2017; Ivanov, 2012; Rothman, 2009). These mixed findings suggest that interface vulnerability is unlikely to be uniform across all phenomena and instead calls for systematic investigation of specific linguistic domains.

The present study focuses on presupposition, a core pragmatic phenomenon situated at the semantic–pragmatic interface. Presuppositions are propositions that are taken for granted within the common ground of a discourse and are assumed by the speaker to be already accepted by the interlocutor (Stalnaker, 1973, 1974). During language comprehension, individuals routinely rely on background assumptions that are not explicitly asserted in the sentence. This backgrounded content does not introduce new information but is nonetheless necessary for the utterance to be felicitous. Such content constitutes a presupposition. Consider the example below: Bob stopped smoking, Bob used to smoke, and Bob did not smoke anymore at a certain point in time.

Sentence (1) presupposes the content in (2): that Bob used to smoke. This presupposed content can be distinguished from the asserted content in (3), which constitutes the main propositional contribution of the utterance. Presuppositions are triggered by specific lexical items or syntactic constructions—known as presupposition triggers—such as definite descriptions, factive predicates, iterative predicates, change-of-state verbs, implicative predicates, temporal clauses, and cleft constructions (Heim, 1982; Karttunen, 1974; Karttunen & Peters, 1979; Levinson, 1983; Stalnaker, 1974). In example (1), the verb *stopped* functions as a change-of-state predicate that triggers the presupposition that the activity was previously ongoing.

When a presupposition is triggered, comprehenders must evaluate whether the presupposed proposition is already part of the common ground. If the presupposition is satisfied—i.e., compatible with shared contextual knowledge—the utterance proceeds smoothly. If not, a presupposition violation occurs. In such cases, comprehenders may either accommodate the presupposition by updating the discourse model to incorporate the new assumption, or reject the update, resulting in processing difficulty or infelicity. Thus, presupposition processing requires integration of lexical semantics, discourse representation, and pragmatic inference.

Importantly, apart from acquiring the lexical realization of specific presupposition triggers in the target language, L2 learners do not need to acquire entirely novel cognitive mechanisms. Presuppositional reasoning is assumed to be universal and grounded in general pragmatic competence. The core learning task for L2 learners is therefore to map pre-existing inferential mechanisms onto new lexical and structural forms in the L2. However, because presupposition

involves the coordination of semantic triggers and contextual updating, it constitutes an external interface phenomenon under the Interface Hypothesis and may therefore remain vulnerable.

While presupposition has been extensively studied in formal semantics (Heim, 1982; Karttunen, 1974) and in experimental pragmatics (Noveck & Reboul, 2008), relatively few studies have examined how L2 learners compute and adjust presuppositions during comprehension. Cho (2017) investigated the acquisition of definite noun phrases by Korean learners of English and argued that difficulty with the definite article stems from cross-linguistic differences in feature composition. Feng (2019) replicated and extended this work with Mandarin-speaking learners of English, using acceptability judgment tasks to show that intermediate learners struggled in non-deictic conditions that required accommodation of presuppositions triggered by definiteness. These findings were interpreted as supporting the semantic–pragmatic interface hypothesis (Sorace, 2011), suggesting that presupposition accommodation occurs at a vulnerable external interface.

Feng (2022) further examined presupposition computation and suspension using a picture-selection task with a covered box. Comparing native speakers and Mandarin-speaking L2 learners of English, the study found that L2 learners were capable of computing presuppositions triggered by stop under affirmative conditions, but encountered difficulty suspending or locally accommodating presuppositions under negation. These results suggest that while L2 learners can generate presuppositions, adjustment processes—especially under complex embedding—pose greater challenges.

Overall, although a limited number of studies have supported the vulnerability of presupposition acquisition, the empirical base remains fragmented. No quantitative synthesis has systematically evaluated the magnitude and consistency of effects across studies. Meta-analysis, as a statistical technique for synthesizing empirical findings, reduces subjectivity inherent in narrative reviews and allows for quantification of effect sizes (Borenstein et al., 2009; Cooper, Hedges, & Valentine, 2019; Lipsey & Wilson, 2001). The present study, therefore, conducts a meta-analysis of presupposition processing and acquisition in order to evaluate whether evidence supports the semantic–pragmatic interface hypothesis.

B. Methods

Literature Search and Selection Criteria

The present study adopted a systematic meta-analytic approach to synthesize empirical research on presupposition processing and acquisition. To ensure comprehensive coverage and minimize selection bias, multiple international and Chinese academic databases were searched. The searched databases included Linguistics and Language Behavior Abstracts (LLBA), ProQuest, Scopus, Web of Science, Google Scholar, and China National Knowledge Infrastructure (CNKI). These databases were selected because they cover major journals in linguistics, psycholinguistics, second language acquisition, and cognitive science.

Both English and Chinese keywords were used to broaden the search's inclusiveness. The English and Chinese search terms included “presupposition,” “accommodation,” “semantic-pragmatic interface,” “triggers,” and “L2 speakers.” Through this systematic search process, 186 potentially relevant studies were identified.

After removing duplicated entries across databases, titles and abstracts were screened to determine relevance. Studies that did not directly investigate presupposition processing or acquisition were excluded at this stage. The remaining articles were examined in full text according to predefined inclusion and exclusion criteria. Ultimately, 15 independent empirical

studies were retained for meta-analysis. These studies provided 23 independent effect sizes and involved a total of 473 native speakers and 185 L2 learners. The dataset included Chinese, English, Korean, Italian, German, and Japanese, ensuring cross-linguistic diversity.

To guarantee methodological rigor and theoretical relevance, strict inclusion criteria were applied. First, only empirical studies were included; theoretical discussions and review articles were excluded. Second, the research topic had to focus specifically on presupposition processing or acquisition. Third, studies had to employ a clearly described and rigorous experimental design. Fourth, for L2 studies, the theoretical framework had to be explicitly grounded in the semantic–pragmatic interface hypothesis. Fifth, sufficient statistical information had to be reported to allow effect-size calculation, including sample size, means, standard deviations, test statistics, and p-values. Finally, to ensure quality control, only articles published in SSCI Q1 or Q2 journals, Peking University Core journals, or CSSCI journals were included.

Studies were excluded if they were duplicated, non-empirical, not directly related to presupposition processing or acquisition, or did not involve genuine presupposition triggers. Studies lacking a complete experimental procedure or sufficient statistical data were also excluded. In addition, L2 studies not grounded in the semantic–pragmatic interface hypothesis were removed, as they did not align with the theoretical focus of the present meta-analysis. Journals that did not meet the quality criteria were also excluded.

Through this rigorous screening procedure, the final dataset was limited to high-quality, theoretically relevant empirical research, thus increasing the reliability of the meta-analytic findings.

Effect Size Calculation

All statistical analyses were conducted using Comprehensive Meta-Analysis (CMA), Version 3. For each study, effect sizes were computed by comparing experimental and control conditions. When multiple experimental comparisons were reported within a single study, effect sizes were averaged to avoid overrepresenting individual studies in the overall analysis. This procedure ensured statistical independence and prevented artificial inflation of the aggregated effect. The present study adopted Hedges' *g* as the standardized effect size index (Borenstein et al., 2009). Hedges' *g* is a bias-corrected version of Cohen's *d* and is particularly suitable for studies with small sample sizes ($n < 50$) (Hedges & Olkin, 1985; Lee et al., 2019). Since several included studies had relatively small sample sizes, Hedges' *g* provided a more conservative and unbiased estimate of effect size. Hedges' *g* is calculated by multiplying Cohen's *d* by a correction factor that adjusts for small-sample bias. Although the computational formula differs slightly from Cohen's *d*, the interpretation follows conventional benchmarks. An effect size of 0.2 is interpreted as small, 0.5 as medium, and 0.8 or above as large (Lipsey & Wilson, 2001; Kang et al., 2019). These benchmarks were used consistently throughout the analysis. When statistical information was not reported in standardized form, effect sizes were calculated from available statistics, such as *t*-values, *F*-values, or *p*-values, using CMA's built-in conversion functions. This ensured that all included studies contributed quantitatively comparable estimates.

Model Selection and Heterogeneity Analysis

Before aggregating effect sizes, a heterogeneity analysis was conducted to determine whether a fixed-effects or random-effects model was more appropriate. The *Q* statistic yielded a *p*-value of 0.755, well above the conventional threshold of 0.05. This indicates that the observed variability among effect sizes was not statistically significant. In other words, the differences among studies were likely due to sampling error rather than systematic variation.

In addition, the *I*² statistic was 0.00, indicating that none of the observed variance was attributable to between-study heterogeneity. An *I*² value close to 0% suggests extremely low

heterogeneity, while values above 75% typically indicate substantial heterogeneity. The present value, therefore, demonstrates strong consistency across studies. Given the absence of significant heterogeneity, a fixed-effects model was adopted. This model assumes that all included studies estimate a common underlying true effect size. Under this assumption, variations across studies are interpreted as random sampling fluctuations rather than reflecting different population effects.

Publication Bias and Robustness Checks

To evaluate the possibility of publication bias, a funnel plot was generated. In the funnel plot, the horizontal axis represents the effect size (Hedges' g), and the vertical axis represents the standard error. In the absence of publication bias, effect sizes should be symmetrically distributed around the overall mean. The funnel plot showed a relatively symmetrical distribution, with studies evenly dispersed around the mean effect size. This visual inspection suggests that publication bias is unlikely. Furthermore, a fail-safe N analysis was conducted. The fail-safe N was 563 ($p < .001$), meaning that 563 additional unpublished null-result studies would be required to reduce the overall effect to non-significance. This number greatly exceeds the 15 studies included in the meta-analysis, indicating strong robustness and stability of the findings. Taken together, the heterogeneity test, funnel plot, and fail-safe N analysis suggest that the meta-analytic results are statistically reliable and not substantially affected by publication bias.

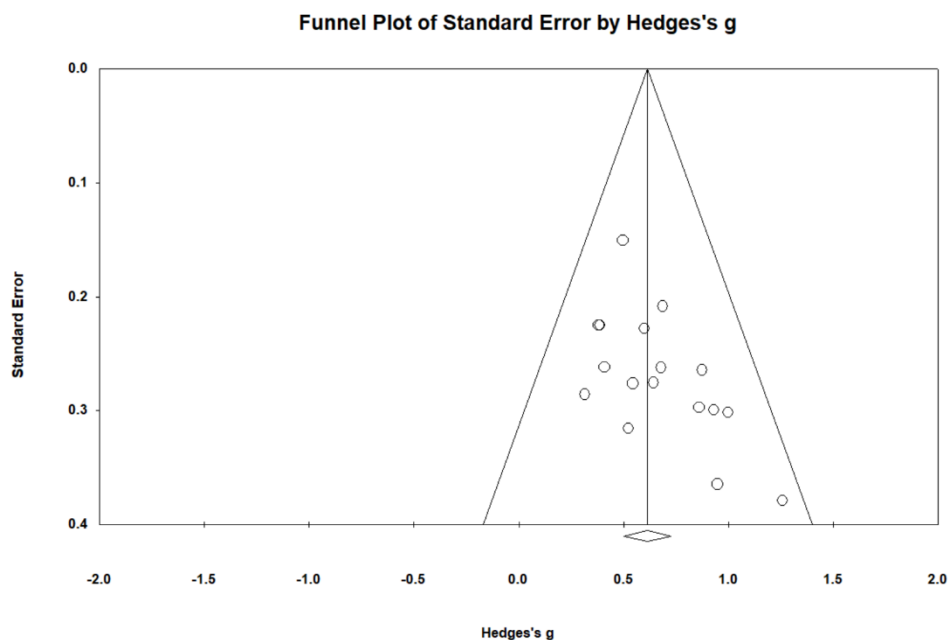


Figure 1. Funnel Plot of Hedges's g Effect Sizes.

C. Results and Discussion

Overall Effect Size

Under the fixed-effects model, the overall effect size for presupposition processing and acquisition was Hedges' $g = 0.614$ ($p < .01$). This value falls within the medium range, indicating a medium effect size. The 95% confidence interval ranged from 0.501 to 0.726 and did not include zero. This confirms that the overall effect is statistically significant and positive. Although six individual samples reported p -values greater than 0.05, the aggregated result

remained significant. This indicates that, despite some variability at the individual-study level, the overall pattern across studies shows a reliable and meaningful effect of presupposition processing and acquisition. In practical terms, this medium effect size suggests that both native speakers and L2 learners show measurable sensitivity to presuppositional information during comprehension or judgment tasks.

Table 1. Overall Effect Size

Model	Study name	Subgroup within study	Outcome	Statistics for each study							Hedges's g and 95% CI				
				Hedges's g	Standard error	Variance	Lower limit	Upper limit	Z-Value	p-Value	-1.00	-0.50	0.00	0.50	1.00
	Burkhardt	definite	N400	0.960	0.297	0.088	0.278	1.443	2.895	0.004					
	Burkhardt	definite	N400	0.523	0.315	0.099	-0.096	1.141	1.657	0.098					
	Cho (2017)	definite	acceptabilit	0.874	0.264	0.070	0.355	1.392	3.304	0.001					
	Domanesch	change of	N400	0.316	0.286	0.082	-0.244	0.876	1.105	0.269					
	Domanesch	definite	N400	0.931	0.299	0.090	0.344	1.517	3.108	0.002					
	Feng (2019)	definite	acceptabilit	0.544	0.276	0.076	0.003	1.086	1.970	0.049					
	Feng	change of	reaction	0.388	0.225	0.051	-0.053	0.829	1.723	0.085					
	Feng	change of	reaction	0.380	0.225	0.051	-0.061	0.821	1.691	0.091					
	Masia et al.	definite	N400	0.409	0.262	0.069	-0.104	0.922	1.562	0.118					
	Masia et al.	temporal	N400	0.409	0.262	0.069	-0.104	0.922	1.562	0.118					
	Schneider	definite	acceptabilit	0.688	0.208	0.043	0.279	1.097	3.299	0.001					
	Schneider	iterative	acceptabilit	0.688	0.208	0.043	0.279	1.097	3.299	0.001					
	Schumache	definite	N400	0.998	0.302	0.091	0.407	1.589	3.309	0.001					
	Schwarz	additive	reaction	0.497	0.151	0.023	0.201	0.792	3.295	0.001					
	Schwarz	additive	eye-tracking	0.948	0.364	0.133	0.233	1.662	2.601	0.009					
	Tiemann	iterative	acceptabilit	1.257	0.379	0.143	0.514	1.999	3.318	0.001					
	Tiemann et	iterative	reaction	0.679	0.262	0.069	0.165	1.193	2.588	0.010					
	Wang &	definite	N400	0.644	0.275	0.076	0.104	1.183	2.339	0.019					
	冯硕 (2021)	change of	reaction	0.598	0.228	0.052	0.151	1.044	2.621	0.009					
Fixed				0.614	0.057	0.003	0.501	0.726	10.691	0.000					

Moderator Analysis

To explore potential sources of variation, moderator analyses were conducted based on language user, trigger category, research method, presupposition stage, language, and task type.

Table 2. Moderator Variables and Related Statistics

Moderator Variable		Sample Size (k)	Effect Size (Hedges' s g)	P value	Standard Error (SE)	95% Confidence Interval		Q value
						Lower Bound	Upper Bound	
Language Users	Native Speakers	14	0.644	0.000	0.068	0.511	0.777	10.274
	L2 Learners	5	0.537	0.000	0.108	0.326	0.749	2.617
Presupposition Triggers	Iterative Verbs	2	0.563	0.000	0.139	0.290	0.836	1.308
	Change-of-State Verbs	4	0.430	0.000	0.119	0.198	0.663	0.784
	Definite Descriptions	9	0.709	0.000	0.091	0.531	0.886	4.197
	Factive Verbs	3	0.774	0.000	0.150	0.480	1.068	1.926
	Temporal Subordinate Clauses	1	0.409	0.118	0.262	-0.104	0.922	0.000
Method	Cover Box Paradigm	3	0.454	0.001	0.130	0.198	0.710	0.590
	Self-Paced Reading	4	0.606	0.000	0.098	0.414	0.798	0.911

Moderator Variable		Sample Size (k)	Effect Size (Hedges' g)	P value	Standard Error (SE)	95% Confidence Interval		Q value
						Lower Bound	Upper Bound	
	Acceptability Judgment Task	3	0.826	0.000	0.171	0.491	1.160	2.366
	ERP	8	0.618	0.000	0.101	0.420	0.816	5.835
	Eye-Tracking	1	0.948	0.009	0.364	0.233	1.662	0.000
Presupposition Stage	Presupposition Generation	15	0.603	0.000	0.063	0.479	0.727	8.579
	Presupposition Accommodation	4	0.663	0.000	0.136	0.397	0.930	4.853
Language	German	11	0.683	0.000	0.076	0.535	0.832	8.392
	Italian	2	0.409	0.027	0.185	0.046	0.772	0.000
	Japanese	1	0.644	0.019	0.275	0.104	1.183	0.000
	L1 Chinese – L2 English	4	0.471	0.000	0.118	0.239	0.702	0.677
	L1 Korean – L2 English	1	0.874	0.001	0.264	0.355	1.392	0.000
Task Type	Online Tasks	16	0.587	0.000	0.061	0.467	0.706	9.486
	Offline Tasks	3	0.826	0.000	0.171	0.491	1.160	2.366

First, the language user significantly moderated the effect size. Native speakers showed a medium effect ($g = 0.644$), while L2 learners also showed a medium effect ($g = 0.537$). Although both groups demonstrated significant presupposition processing, the smaller effect size for L2 learners suggests reduced sensitivity compared to native speakers. This pattern aligns with predictions of the semantic-pragmatic interface hypothesis, which proposes that external interfaces remain vulnerable in L2 acquisition. Second, the trigger category influenced the effect size. Definite descriptions showed a relatively strong effect ($g = 0.709$), indicating robust processing of definiteness-related presuppositions. In contrast, temporal clauses showed a non-significant effect ($p > 0.05$), suggesting weaker or less consistent presuppositional processing in this category. This may indicate that not all triggers function equally strongly across contexts. Third, the research method had a moderating effect. ERP studies showed substantial effects ($g = 0.618$), and acceptability judgment tasks and eye-tracking methods produced large effect sizes. Black-box paradigms showed relatively smaller effects. The strong effects in ERP and eye-tracking studies suggest that online processing measures are particularly sensitive to presuppositional computation. Fourth, the presupposition stage significantly moderated outcomes. Both presupposition generation ($g = 0.603$) and presupposition accommodation ($g = 0.663$) yielded medium effects. This indicates that participants are generally capable of both generating and adjusting presuppositional inferences. Fifth, language did not substantially moderate results, except for German. Overall, cross-linguistic differences appeared limited, suggesting that presupposition processing reflects general pragmatic mechanisms rather than language-specific rules.

Finally, task type influenced effect sizes. Online tasks showed a medium effect ($g = 0.587$), while offline tasks showed a large effect ($g = 0.826$). This difference may reflect the additional time and reflection allowed in offline tasks, which could enhance explicit sensitivity to presuppositional violations. Overall, the moderator analyses reveal that presupposition processing is robust across populations, methods, and languages, but subtle differences emerge depending on processing demands and participant type.

The present meta-analysis examined whether language users can process and acquire pragmatic presuppositions and explored factors that may moderate effect sizes across studies. The findings reveal several important patterns that contribute not only to presupposition research, but also to broader debates concerning the semantic–pragmatic interface and second language acquisition.

First, the overall results indicate that, compared with assertions, language users are generally sensitive to pragmatic presuppositions. When presuppositions are violated, participants can detect the mismatch and adjust accordingly to ensure successful communication. The overall medium effect size suggests that presupposition processing is neither trivial nor overwhelmingly difficult; rather, it represents a cognitively meaningful but manageable component of language comprehension. This finding reinforces the view that presuppositions are an integral part of pragmatic competence and play a central role in everyday communication.

At the level of language users, both native speakers and second language learners demonstrated the ability to process pragmatic presuppositions. This finding is theoretically significant because it shows that presuppositional meaning is learnable in a second language. However, the effect size for L2 learners was smaller than that for native speakers, as expected. Presupposition processing involves integrating semantic meaning with contextual information and discourse assumptions. Such integration requires cognitive resources, linguistic proficiency, and pragmatic awareness. L2 learners often face limitations in vocabulary knowledge, syntactic processing, and real-time integration of contextual cues, which may constrain their performance.

These results lend support to the semantic–pragmatic interface hypothesis proposed by researchers such as Antonella Sorace. According to this hypothesis, linguistic phenomena at external interfaces—such as the interface between syntax, semantics, and discourse pragmatics—are especially vulnerable in second-language acquisition. Presupposition, as a phenomenon that requires coordination between semantic triggers and discourse context, clearly falls within this external interface domain. The present findings, therefore, provide empirical support for the claim that interface-related phenomena are more difficult to acquire and may require greater cognitive effort for L2 learners.

At the same time, it is noteworthy that the difference between native speakers and L2 learners was not statistically significant. This suggests that L2 learners may, under certain conditions, approximate native-like performance. However, the number of L2 studies included in the meta-analysis was relatively small, which may limit the reliability of this comparison. A smaller sample size can reduce statistical power and potentially mask meaningful differences. Therefore, while the results indicate that L2 learners can acquire presuppositions, further large-scale empirical studies are needed to determine whether full convergence with native norms is consistently attainable.

With respect to presupposition trigger categories, the definite description category exerted a particularly strong moderating effect. This is likely because a large proportion of existing research has focused on definite descriptions as presupposition triggers. Studies such as those summarized by Filippo Domaneschi have placed definite descriptions at the center of experimental investigation, thereby shaping the empirical landscape of presupposition research. As a result, the robustness of findings in this category may reflect both theoretical importance and methodological concentration.

In contrast, temporal subordinate clauses and other less frequently studied trigger types showed weaker effects. This discrepancy highlights a potential imbalance in the literature. Most studies have examined so-called “strong triggers,” a distinction discussed by Sonja Tiemann, while relatively fewer studies have explored weaker or more context-dependent triggers.

Consequently, our understanding of presupposition processing may currently be biased toward those triggers that reliably and transparently generate presuppositions. Future research should therefore expand its scope to include a broader range of trigger types in order to achieve a more comprehensive picture.

In terms of research methodology, behavioral experimental paradigms remain dominant. However, there has been a noticeable increase in the use of neurocognitive techniques such as event-related potentials (ERP). ERP studies provide fine-grained temporal information about processing stages and can distinguish between early automatic detection and later reanalysis or integration processes. The growing adoption of eye-tracking and ERP methods reflects a broader methodological shift in psycholinguistics toward online processing measures. Compared with offline tasks, which capture endpoint judgments, online tasks provide insight into the dynamic process of presupposition computation and adjustment. The present meta-analysis confirms that task type moderates effect size, with online tasks increasingly becoming the standard approach. This trend suggests that future presupposition research will increasingly rely on real-time measures to uncover the cognitive mechanisms underlying pragmatic interpretation.

Regarding presupposition stages, research on presupposition generation remains dominant, although interest in presupposition accommodation (or adjustment) has increased in recent years. Both stages yielded medium effect sizes, indicating that language users can generate presuppositions and adjust them when necessary. However, presupposition adjustment appears to be more cognitively demanding. Adjustment requires detecting a conflict between the presupposition and contextual information, inhibiting default assumptions, and reconstructing a coherent interpretation. This multi-step process likely imposes greater cognitive load, especially for L2 learners.

Previous studies, such as those conducted by Feng (2022), have shown that Chinese learners of English can compute presuppositions but encounter difficulty when required to doubt or revise them. The present findings are consistent with that pattern. From a pedagogical perspective, this suggests that L2 instruction should not focus solely on helping learners recognize presupposition triggers. Rather, teaching should also emphasize the ability to revise and accommodate presuppositions in conflict contexts. Developing this skill may significantly enhance learners' pragmatic competence.

In terms of language differences, the moderating effect of language was relatively weak. Apart from German, most languages were represented by only a few studies. Overall, cross-linguistic variation did not substantially influence effect sizes. This may indicate that presupposition is a relatively universal pragmatic phenomenon that operates according to similar cognitive principles across languages. If presupposition processing relies on general cognitive and discourse mechanisms, then L2 learners may benefit from positive transfer from their first language. However, the limited representation of languages in the current dataset prevents strong conclusions. More cross-linguistic research is necessary to determine whether structural or typological differences meaningfully affect presupposition generation and accommodation.

Taken together, the findings confirm that both native speakers and L2 learners can process and adjust pragmatic presuppositions. Nevertheless, L2 learners exhibit comparatively weaker performance, particularly in the domain of presupposition adjustment. This pattern supports the semantic-pragmatic interface hypothesis and highlights the complexity of acquiring pragmatic competence. The results also underscore the importance of methodological innovation and balanced coverage of trigger types in future research.

D. Conclusion

This study conducted a meta-analysis of empirical research on pragmatic presupposition processing and acquisition. By synthesizing findings from 15 studies and 23 independent effect sizes, the analysis provides quantitative evidence concerning the magnitude and stability of presupposition effects across different populations, trigger types, research methods, and task conditions. The overall medium effect size indicates that language users are generally sensitive to pragmatic presuppositions and capable of adjusting them when they are violated. Both native speakers and second-language learners can generate and accommodate presuppositions, though L2 learners show somewhat weaker performance. These findings provide empirical support for the semantic–pragmatic interface hypothesis and confirm that interface-related phenomena pose particular challenges in second language acquisition.

The study also reveals that definite descriptions dominate the research landscape, while other trigger types remain underexplored. Methodologically, there is a clear shift toward online processing tasks and neurocognitive techniques, reflecting a growing interest in uncovering the real-time mechanisms of pragmatic computation. In the domain of presupposition stages, adjustment emerges as more cognitively demanding than generation, with important implications for L2 instruction. Despite its contributions, the present study has several limitations. The overall sample size remains relatively small, and certain moderator levels were underrepresented. The limited number of L2 studies and the uneven distribution of languages restrict the generalizability of some conclusions. Furthermore, publication bias, although statistically minimal, can never be completely ruled out in meta-analytic research.

Future research should expand the empirical base of presupposition studies, particularly in second language contexts and across diverse languages. More attention should be paid to weaker presupposition triggers, naturalistic discourse contexts, and longitudinal designs that track developmental change. Combining behavioral measures with neurocognitive methods may also deepen our understanding of how presuppositions are computed and revised in real time. In sum, pragmatic presupposition represents a valuable testing ground for theories of the semantic–pragmatic interface. Continued investigation of this phenomenon will not only refine our understanding of pragmatic competence but also contribute to broader theoretical models of language processing and acquisition.

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