CONTEXTUAL MEANING AND IMPLICATURE TRANSFER IN HUMAN AND AI-GENERATED ACADEMIC TRANSLATIONS

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Abstract: *The increasing use of artificial intelligence (AI) in academic translation has raised important questions regarding the quality of meaning transfer beyond surface-level fluency. While AI-generated translations often demonstrate grammatical accuracy and lexical naturalness, less attention has been paid to how contextual meaning and implicature are reconstructed in comparison with human translation. This study investigates contextual framing and implicature transfer in human and AI-generated translations of academic abstracts. Drawing on pragmatic theory and functionalist approaches to translation, the research adopts a qualitative comparative design grounded in linguopragmatic analysis. A corpus of 10–15 academic abstracts was translated independently by human translators and an AI-based system, and instances of implicature were identified and analysed in relation to contextual adequacy.*

The findings reveal systematic differences between translation modes. AI-generated translations frequently exhibit contextual framing shifts, implicature loss, and implicature strengthening through explicitation. Although linguistically fluent, such translations tend to approximate contextual meaning through probabilistic association rather than inferential reconstruction. Human translations, by contrast, demonstrate greater sensitivity to disciplinary positioning, epistemic calibration, and discourse coherence. The study argues that translational adequacy in academic contexts is fundamentally grounded in pragmatic reconstruction rather than formal equivalence. These findings contribute to translation theory and provide critical insight into the limitations and appropriate use of AI-assisted translation in scholarly communication.

Key words: *contextual meaning; implicature; AI-generated translation; academic discourse; pragmatic adequacy.*

Introduction. The rapid development of artificial intelligence (AI), particularly neural machine translation and large language models, has transformed contemporary translation practices (Koehn, 2020; Kenny, 2022). AI-generated translations are now widely used in academic contexts due to their speed, accessibility, and increasingly fluent output. In many cases, such systems produce grammatically accurate and lexically natural translations that appear functionally equivalent to human work at the surface level. As a result, AI translation tools are often integrated into scholarly communication and multilingual publication workflows. However, growing evidence suggests that fluency and formal accuracy do not necessarily guarantee successful transfer of meaning (Moorkens, 2018). In academic discourse, meaning is rarely confined to propositional content alone; rather, it is constructed through complex interaction between linguistic form, discourse structure, and contextual inference (Hyland, 2005; Levinson, 1983). Authors rely heavily on implicit evaluation, calibrated stance, disciplinary conventions, and shared background knowledge to shape interpretation. Consequently, translation in academic contexts requires more than lexical substitution or syntactic alignment — it demands the reconstruction of contextual meaning.

Within pragmatics, contextual meaning refers to meaning that arises from the interaction between utterance and context (Levinson, 1983). A central mechanism through which such meaning is conveyed is implicature. Following Grice's (1975) theory of conversational implicature, speakers and writers communicate indirectly, signalling caution, evaluation, limitation, or alignment without explicit assertion. In academic writing, implicature plays a crucial role in maintaining epistemic modesty and disciplinary credibility (Hyland, 2005). While translation studies have long recognised the importance of pragmatic equivalence (Hatim & Mason, 1997; House, 2015), research on AI-generated translation

has predominantly focused on surface-level indicators such as fluency, adequacy scores, and lexical accuracy (Koehn, 2020). Comparatively little attention has been paid to how contextual meaning and implicature are transferred — or transformed — in AI-generated academic translations. Existing studies often note pragmatic limitations but rarely examine them through a systematic theoretical framework centred on inferential meaning (Kenny, 2022).

Against this background, the present study investigates contextual meaning and implicature transfer in human and AI-generated academic translations. By adopting a qualitative linguopragmatic approach, the study seeks to identify systematic differences in how inferential meaning is reconstructed across translation modes. In doing so, it aims to contribute to ongoing debates on translation quality in the age of artificial intelligence and to clarify whether AI systems merely reproduce linguistic patterns or approximate deeper pragmatic processes.

Context in Pragmatics. In pragmatics, context is understood not merely as the physical or situational environment in which communication occurs, but as a complex set of cognitive, social, and discourse-related factors that shape meaning interpretation (Levinson, 1983). Meaning is not fully encoded in linguistic form; rather, it emerges through interaction between utterance and contextual assumptions shared by participants (Levinson, 1983). These assumptions may include prior discourse, background knowledge, disciplinary conventions, communicative intentions, and expectations regarding genre. Contextual meaning, therefore, refers to meaning that is inferentially derived rather than explicitly stated. In academic discourse, context plays a particularly significant role. Authors position their claims within existing research traditions, signal alignment or distance from prior studies, and calibrate their epistemic stance through subtle linguistic choices (Hyland, 2005). Such positioning often relies on implicit cues that presuppose shared disciplinary knowledge. Consequently, successful interpretation requires not only decoding linguistic content but reconstructing the contextual frame within which that content operates. From a translation perspective, this implies that translation is not simply a transfer of words or structures, but a reconstruction of contextual meaning in a new linguistic and cultural environment (House, 2015). Failure to appropriately reconstruct contextual assumptions may result in shifts in interpretation, altered stance, or reduced disciplinary alignment. Context, therefore, constitutes a central dimension of translational adequacy.

A key mechanism through which contextual meaning is conveyed is implicature. In his seminal work on conversational pragmatics, Grice (1975) proposed that communication operates according to a Cooperative Principle and associated conversational maxims. When speakers appear to violate these maxims, hearers infer additional meaning — conversational implicature — beyond what is explicitly stated. Implicature enables speakers and writers to communicate indirectly, often allowing them to signal evaluation, limitation, criticism, or caution without overt expression. In academic writing, implicature frequently underpins epistemic restraint and disciplinary politeness (Hyland, 2005). For example, phrases such as “the results suggest” or “it may be argued” can carry evaluative force that depends on shared interpretive conventions rather than explicit assertion.

Levinson (1983) further systematised implicature by emphasising its inferential and context-dependent nature. Implicature is not encoded in linguistic form; it arises from interaction between utterance and contextual expectations. This inferential dimension is crucial for translation, since preserving implicature requires recognising not only what is said, but what is implied (Hatim & Mason, 1997). In translation, implicature may be preserved, weakened, strengthened, or lost. Explicitation — the rendering of implicit meaning in explicit form — can alter pragmatic force, while omission or misinterpretation may disrupt intended stance (Baker, 2018). Thus, implicature transfer serves as a sensitive indicator of pragmatic competence in translation.

Translation studies have long acknowledged that equivalence at the level of linguistic form is insufficient for ensuring communicative adequacy. Functionalist and discourse-oriented approaches emphasise that translation must preserve communicative purpose and pragmatic effect rather than merely formal correspondence (Nord, 1997; Reiss, 2000). Context reconstruction in translation involves identifying the contextual assumptions underlying the source text and recreating them in the target discourse environment. This includes reconstructing authorial intention, disciplinary positioning, and genre conventions (Hatim & Mason, 1997). Particularly in academic translation, where subtle stance markers and discourse structures shape interpretation, context reconstruction becomes central

to adequacy (House, 2015). Pragmatic equivalence, therefore, entails more than semantic alignment; it requires successful transfer of inferential meaning. When contextual cues are misaligned or implicatures are altered, the resulting translation may remain grammatically accurate yet pragmatically inadequate. In this sense, contextual and implicature transfer provide a more refined analytical lens than general measures of fluency or lexical accuracy (House, 2015).

Contemporary AI translation systems are based on neural machine translation and large language models that operate through probabilistic pattern recognition (Koehn, 2020; Kenny, 2022). These systems generate output by predicting the most statistically probable sequence of tokens given the input and learned training data. While this mechanism enables high levels of fluency and structural coherence, it does not inherently involve intentional reasoning or inferential awareness (Kenny, 2022). Unlike human translators, who interpret utterances within a cognitive model of context and communicative intention, AI systems approximate contextual patterns through statistical association. Although they may reproduce linguistic signals commonly associated with implicature — such as hedging expressions or discourse markers — the generation process remains probabilistic rather than inferential. This distinction aligns with broader discussions in computational linguistics regarding the distributional nature of large language models (Koehn, 2020).

This distinction raises an important theoretical question: can probabilistic modelling adequately approximate the inferential processes required for contextual meaning transfer? If implicature relies on context-sensitive reasoning (Grice, 1975; Levinson, 1983), then differences between human and AI translations may reveal deeper contrasts in meaning construction rather than mere performance variation. By integrating pragmatic theory with translation studies and computational language modelling, the present study seeks to examine how contextual meaning and implicature are reconstructed — or transformed — across human and AI-generated academic translations.

Methodology. This study adopts a qualitative comparative research design to investigate contextual meaning and implicature transfer in human and AI-generated academic translations. A qualitative approach is particularly appropriate for analysing inferential meaning, as implicature and context reconstruction cannot be reliably captured through quantitative metrics alone (House, 2015). Rather than measuring translation quality numerically, the study seeks to identify systematic patterns in how contextual assumptions and implied meanings are preserved, modified, or transformed across translation modes, in line with descriptive traditions in translation studies (Toury, 1995).

The corpus consists of academic research article abstracts selected from peer-reviewed journals in the humanities and social sciences. Abstracts were chosen for three main reasons. First, they are dense in contextual and inferential meaning, requiring careful calibration of stance and evaluation (Hyland, 2005). Second, they represent a clearly defined academic genre with established discourse conventions. Third, they are sufficiently compact to allow detailed qualitative analysis while maintaining analytical depth. All source texts belong to closely related disciplines in order to minimise variation in rhetorical norms. The study is restricted to one-directional translation from the source language into the target language to ensure methodological control over contextual interpretation. The corpus includes 10–15 abstracts. Each source text was translated independently by a human translator and by a selected AI-based translation system under controlled conditions. Human translators were instructed to produce academically publishable translations without AI assistance. AI translations were generated without post-editing or stylistic prompting, allowing analysis of default output (Kenny, 2022).

Implicature instances were identified through close reading of the source texts, with particular attention to linguistic environments in which meaning extends beyond explicit propositional content. The identification process was guided by Grice's (1975) principles of conversational implicature and subsequent pragmatic developments highlighting the inferential and context-dependent nature of meaning (Levinson, 1983). The analysis focused on scalar implicature (e.g., "some", "may", "tend to") (Levinson, 1983), epistemic hedging conveying indirect evaluation (Hyland, 2005), implicit limitation or contrast (Grice, 1975), indirect criticism or disciplinary positioning (Hyland, 2005), and presuppositional triggers with inferential consequences (Levinson, 1983). An utterance was considered to contain implicature when its full interpretation required inferential reasoning based on contextual assumptions rather than literal semantic content alone (Grice, 1975). Each identified instance in the

source text was subsequently examined in the corresponding human and AI translations to determine whether the implied meaning was preserved, strengthened, weakened, or eliminated.

Contextual adequacy was assessed qualitatively according to the extent to which the translation preserved communicative intention, authorial stance and epistemic calibration, disciplinary positioning, and overall discourse coherence and contextual alignment. These criteria reflect functionalist and discourse-oriented perspectives on translation, which conceptualise adequacy in terms of communicative purpose and pragmatic equivalence rather than formal correspondence (Nord, 1997; House, 2015). A translation was considered contextually adequate when it successfully reconstructed the inferential conditions necessary for interpreting the utterance within the academic discourse community (Hatim & Mason, 1997). Conversely, contextual inadequacy was identified when implicature was lost or rendered unnecessarily explicit (Grice, 1975), inferential meaning was distorted, stance was unintentionally strengthened or weakened (Hyland, 2005), or contextual framing shifted interpretation. This framework therefore enables adequacy to be evaluated in pragmatic rather than purely linguistic terms, aligning with discourse-oriented approaches to translation quality assessment (House, 2015).

The analysis followed a four-stage procedure. First, contextual mapping was conducted to identify underlying contextual assumptions and implicit meanings in the source text, guided by pragmatic theories of inference (Grice, 1975; Levinson, 1983). Second, a parallel comparison was carried out to examine corresponding human and AI-generated translations. Third, implicature transfer analysis involved classifying outcomes as preservation, explicitation, attenuation, distortion, or loss, in line with discourse-oriented approaches to translation analysis (Hatim & Mason, 1997). Finally, an interpretative evaluation assessed how these outcomes affected contextual adequacy (House, 2015). The study did not aim to quantify error frequency but rather to identify systematic tendencies in contextual and implicature transfer, consistent with descriptive traditions in translation studies (Toury, 1995). Observed patterns were interpreted through the theoretical distinction between inferential human processing and probabilistic AI language modelling (Kenny, 2022).

Reliability was supported through consistent application of clearly defined analytical criteria and systematic comparison across translation pairs. The interpretative procedure followed established descriptive approaches in translation studies, ensuring consistency in the identification and classification of implicature transfer (Toury, 1995). Interpretations were grounded in established pragmatic constructs, particularly inferential models of context and implicature (Grice, 1975; Levinson, 1983), in order to ensure theoretical validity. The use of a single genre and controlled translation direction further enhances methodological consistency and reduces variability unrelated to contextual reconstruction.

Analysis. This section presents a qualitative comparative analysis of contextual meaning and implicature transfer in human and AI-generated academic translations. The analysis is organised into four interrelated categories reflecting distinct but overlapping dimensions of inferential meaning transfer: contextual framing shifts, implicature loss, implicature strengthening through explicitation, and broader context misalignment. The aim is not to quantify deviations, but to reveal systematic tendencies in how contextual meaning is reconstructed across translation modes, consistent with descriptive approaches in translation studies (Toury, 1995).

Contextual framing refers to the broader interpretive frame within which an academic statement is positioned. In research abstracts, authors frequently situate their claims within disciplinary debates, signal alignment or contrast with prior scholarship, and frame findings in relation to established knowledge (Hyland, 2005). Such framing often relies on subtle contextual cues rather than explicit markers. The analysis indicates that AI-generated translations occasionally alter contextual framing through minor lexical substitutions or restructuring that shift interpretive emphasis. For example, statements originally framed as contributing cautiously to an ongoing debate may be rendered as more assertive or conclusive in AI output. Although the propositional content remains largely intact, the contextual orientation of the claim changes. In contrast, human translations demonstrate greater sensitivity to disciplinary positioning. Translators tend to preserve the contextual frame of the original text by maintaining evaluative nuance and relational positioning within the discourse community, reflecting discourse-oriented models of translation (Hatim & Mason, 1997). Even when structural

adjustments occur, the broader interpretive orientation is typically retained. These findings suggest that contextual framing requires recognition of discourse-level assumptions that extend beyond sentence-level processing (Levinson, 1983). While AI systems reproduce frequent academic patterns, they do not consistently preserve the interpretive frame embedded in the source text, highlighting the inferential dimension of contextual meaning.

Implicature loss occurs when meaning that depends on inferential interpretation in the source text is either omitted or rendered in a way that eliminates the need for inference (Grice, 1975). In academic discourse, implicature frequently underlies epistemic caution, subtle evaluation, or indirect critique (Hyland, 2005). The analysis reveals that AI-generated translations exhibit recurring instances of implicature loss, particularly in contexts involving hedged claims or understated evaluation. Scalar implicatures conveyed through modal verbs or quantifiers are occasionally neutralised, resulting in a flatter, more literal interpretation (Levinson, 1983). Similarly, indirect critical positioning may be reduced to descriptive neutrality. Human translations show significantly fewer instances of complete implicature loss. When inferential meaning is altered, it is more commonly attenuated than eliminated. In many cases, translators reconstruct equivalent implicature through target-language pragmatic devices, even when the linguistic form differs from the source text, reflecting discourse-oriented models of translation (Hatim & Mason, 1997). These patterns indicate that implicature preservation depends on recognising communicative intention beyond literal semantics (Grice, 1975). AI systems appear capable of reproducing surface markers associated with caution but do not consistently reconstruct the inferential layer underlying those markers, supporting distinctions between inferential and probabilistic processing (Kenny, 2022).

A prominent tendency observed in AI-generated translations is implicature strengthening through explicitation. In such cases, meaning that is implicit in the source text is rendered more explicitly in the target text. While explicitation does not necessarily distort meaning, it often alters pragmatic force (Baker, 2018). For instance, cautiously implied conclusions may be reformulated as explicit statements, thereby increasing perceived authorial certainty. Similarly, contextually inferable limitations may be verbalised directly, reducing interpretive subtlety. This tendency aligns with the probabilistic logic of AI systems, which favour unambiguous and explicit constructions (Koehn, 2020). Human translations also occasionally employ explicitation; however, such cases tend to be strategic and context-sensitive, reflecting functionalist perspectives on communicative purpose (Nord, 1997). Translators appear to evaluate whether explicitation supports clarity without compromising epistemic positioning (Hyland, 2005). AI-generated explicitation, by contrast, often appears systematic rather than contextually motivated. The cumulative effect of implicature strengthening is a shift in pragmatic tone. While the translation may remain grammatically accurate, it may diverge from the epistemic calibration characteristic of academic discourse, where inferential subtlety plays a central role (Grice, 1975).

Beyond isolated implicature shifts, broader cases of context misalignment were observed in AI-generated translations. Context misalignment occurs when the translation fails to preserve the relational structure between statements, disciplinary positioning, or assumed background knowledge (Hatim & Mason, 1997). Examples include altered temporal sequencing, weakened contrastive relations, or changes in evaluative orientation that affect how claims are interpreted within the broader argumentative structure. Although such shifts may not disrupt local comprehensibility, they influence global coherence and interpretive alignment, which are central to discourse-level meaning construction (House, 2015). Human translations generally maintain stronger contextual alignment. Translators demonstrate awareness of discourse progression and inter-sentential relations, adjusting structures where necessary to preserve coherence within the target academic context (Hyland, 2005).

These findings suggest that contextual meaning operates at multiple levels — lexical, sentential, and discourse-wide — and that AI systems remain more reliable at reproducing local patterns than managing global inferential coherence (Levinson, 1983; Kenny, 2022). Across all categories, the analysis reveals systematic contrasts between human and AI-generated translations. AI output frequently maintains surface-level fluency while exhibiting subtle but cumulative shifts in contextual framing and implicature transfer. Human translations, although not free from deviation, demonstrate greater inferential consistency and context-sensitive adaptation. These patterns provide empirical

support for the theoretical distinction between inferential human meaning construction (Grice, 1975) and probabilistic AI language modelling (Koehn, 2020; Kenny, 2022).

Discussion. The findings of this study point to a fundamental distinction between inferential and statistical approaches to meaning construction. Human translators appear to reconstruct contextual meaning through inferential reasoning: they interpret utterances within a cognitive model of communicative intention, disciplinary norms, and discourse history. Implicature, in this process, is not treated as a surface linguistic feature but as a contextual effect that must be preserved through pragmatic adaptation (Grice, 1975; Levinson, 1983). AI-generated translations, by contrast, operate through probabilistic pattern recognition. While neural systems are capable of producing linguistically fluent output and reproducing common academic markers, their generation process is based on statistical likelihood rather than intentional inference (Koehn, 2020; Kenny, 2022). As a result, AI output may replicate formal indicators of caution or evaluation without consistently reconstructing the inferential relationships that give rise to implicature.

The recurrent patterns observed — contextual framing shifts, implicature loss, and systematic explicitation — suggest that AI systems approximate contextual meaning through learned correlations rather than through contextual modelling in the pragmatic sense. This distinction does not imply that AI translations are incapable of conveying inferential meaning; rather, it indicates that inferential coherence emerges incidentally rather than through deliberate reasoning processes. The contrast between human inferential processing and AI statistical generation provides a theoretical explanation for why AI translations may remain grammatically accurate yet pragmatically unstable. Inferential meaning depends on recognising what is implied but not explicitly stated — a process that requires modelling communicative intention and shared contextual assumptions (Grice, 1975). Probabilistic systems, while sophisticated, do not inherently model intention; they model distributional patterns (Kenny, 2022).

The findings reinforce longstanding arguments within functionalist and discourse-oriented translation theory that translational adequacy is fundamentally pragmatic rather than purely formal (Nord, 1997; House, 2015). If contextual meaning and implicature are central to academic discourse, then translation quality cannot be adequately assessed through lexical equivalence or fluency alone (Hatim & Mason, 1997). This study suggests that contextual reconstruction and implicature transfer should be foregrounded as core evaluative dimensions in translation quality assessment. The distinction between formal equivalence and pragmatic adequacy — long debated in translation theory (Reiss, 2000) — becomes particularly salient in the context of AI-generated translation, where surface-level coherence may mask deeper inferential shifts.

Moreover, the results invite reconsideration of how equivalence is conceptualised in contemporary translation studies. Rather than viewing translation as alignment between source and target texts at the structural level, it may be more productive to conceptualise it as reconstruction of inferential environments. In this view, translation success depends on preserving the conditions under which the target reader can derive similar contextual inferences as the source reader (Grice, 1975). By framing contextual meaning and implicature transfer as analytical categories, this study contributes to expanding the theoretical toolkit available for evaluating AI-assisted translation. It demonstrates that pragmatics offers a more sensitive lens for distinguishing between surface fluency and genuine communicative alignment (Levinson, 1983; House, 2015).

The results also carry significant implications for the use of AI tools in academic translation practice. The increasing integration of AI-generated translation into scholarly workflows may create an illusion of adequacy based on grammatical fluency and lexical naturalness (Koehn, 2020). However, the present findings indicate that inferential misalignments may remain undetected without careful pragmatic evaluation (House, 2015). AI systems may be highly effective for preliminary drafting or for providing structural scaffolding (Kenny, 2022). Nevertheless, context-sensitive revision by human translators remains essential when the communicative stakes involve disciplinary positioning, epistemic calibration, or implicit evaluation (Hyland, 2005). In academic discourse, subtle shifts in implicature can influence credibility, perceived certainty, and argumentative coherence (Grice, 1975). Rather than positioning AI and human translation as competing paradigms, these findings support a complementary model. AI systems can accelerate linguistic processing, while human translators

provide inferential judgement and contextual calibration. Recognising the distinct strengths and limitations of probabilistic modelling (Kenny, 2022) may lead to more informed and critically aware integration of AI tools in translation practice. In this respect, pragmatic competence remains a uniquely human dimension of translation expertise. As AI systems continue to evolve, the question may not be whether they can generate fluent text, but whether they can approximate the inferential reasoning required for stable contextual meaning transfer (Levinson, 1983).

Conclusion. This study set out to examine how contextual meaning and implicature are transferred in human and AI-generated academic translations. By adopting a qualitative linguopragmatic approach, the analysis moved beyond surface-level measures of translation quality and focused on inferential processes underlying meaning construction. The findings demonstrate that contextual framing and implicature transfer constitute key areas of divergence between human and AI translation. While AI-generated translations frequently achieve grammatical accuracy and lexical fluency, they exhibit systematic tendencies toward contextual shifts, implicature loss, and implicature strengthening through explicitation. These patterns suggest that AI systems approximate contextual meaning through probabilistic association rather than through inferential modelling of communicative intention. As a result, translations may remain formally coherent yet pragmatically unstable. Human translations, although not immune to deviation, generally preserve inferential coherence more consistently. Translators appear to reconstruct contextual assumptions and epistemic positioning in ways that sustain the interpretive conditions of the source text within the target academic discourse. This inferential sensitivity enables more stable transfer of contextual meaning and implicit evaluation.

From a theoretical perspective, the study reinforces the view that translational adequacy is fundamentally grounded in pragmatic reconstruction rather than formal equivalence. Contextual meaning and implicature transfer offer a refined analytical lens for distinguishing between surface-level fluency and genuine communicative alignment. In the context of AI-assisted translation, these findings underscore the continuing relevance of human inferential competence. Several limitations should be acknowledged. The study focused on a relatively small corpus of academic abstracts within closely related disciplines and examined one-directional translation only. Future research could expand the dataset, explore additional genres, or investigate cross-linguistic variation in contextual inference. Further interdisciplinary work integrating pragmatics, cognitive modelling, and computational linguistics may also provide deeper insight into the relationship between inferential reasoning and probabilistic language generation. In conclusion, as AI translation tools become increasingly integrated into academic communication, careful attention to contextual meaning and implicature remains essential. The capacity to reconstruct inferential meaning — rather than merely reproduce linguistic patterns — continues to define the boundary between statistical fluency and pragmatic adequacy.

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