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Immediacy of Experience and Linguistic Relativity: Epistemological Architectures in the Pirahã Debate

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Abstract. The Pirahã debate has been predominantly framed as an empirical dispute over recursion and universal grammar. This article argues that such framing leaves important epistemological assumptions insufficiently examined. Based on a systematic qualitative review of Web of Science-indexed publications (n = 25), the study uses structured coding to examine positions on recursion, conceptions of experience, and underlying epistemological assumptions. The qualitative synthesis was operationalised in a comparative matrix (Experience × Epistemology × Recursion × Relativity). The analysis identifies three ontologies of experience – data, norm, and structure – and four explanatory architectures: cultural–pragmatic, computational–universalist, methodological–formal, and ontological–phenomenological. It also situates the debate within weak linguistic relativity, including numerical cognition research on Pirahã. Across these perspectives, 'immediacy of experience' emerges as an epistemologically variable construct rather than a deterministic constraint. The article rejects strong determinism and reframes Pirahã as a limit case revealing competing hierarchies of explanation.
Keywords: Pirahã; linguistic relativity; recursion; epistemology of language; immediacy of experience; explanatory architectures.

Patyrimo betarpiškumas ir lingvistinis reliatyvumas: epistemologinės architektūros ginče dėl pirahã kalbos

Santrauka. Pirahã diskusija įprastai pateikiama kaip empirinis ginčas dėl rekursijos ir universaliosios gramatikos. Šiame straipsnyje teigiama, kad tokia formuluotė nesuteikia galimybės pakankamai išsamiai ištirti svarbias epistemologines prielaidas. Remiantis sistemine kokybine *Web of Science* bazėje indeksuotų leidinių (n = 25) apžvalga, tyrime pasitelkiamas struktūrinis kodavimas, leidžiantis nustatyti, kokių nuostatų laikomasi dėl rekursijos, patyrimo sampratos bei pamatinių epistemologinių prielaidų. Apibendrinus duomenis, buvo sudaryta lyginamoji matrica (Patyrimas × Epistemologija × Rekursija × Reliatyvumas). Tyrimas leido išskirti tris patyrimo ontologijas – duomenų, normos ir struktūros ontologijas – bei keturias aiškinamąsias architektūras: kultūrinę-pragmatinę, skaitinę-universalistinę, metodologinę-formaliąją ir ontologinę-fenomenologinę. Prieita prie išvados, kad šis mokslinis ginčas bei pirahã skaitinio pažinimo tyrimas patenka į silpnojo lingvistinio reliatyvumo perspektyvą. Iš šio požiūrio taško „patyrimo betarpiškumo" sąvoka iškyla kaip epistemologiškai kintantis konstruktas, o ne kaip deterministinis apribojimas. Straipsnyje atmetamas stiprusis determinizmas, o pirahã kalbos atvejis pristatomas kaip ribinis atvejis, kurio interpretacijose atskleidžiamos tarpusavyje konkuruojančios hierarchijos.
Pagrindiniai žodžiai: pirahã, lingvistinis reliatyvumas, rekursija, kalbos epistemologija, patyrimo betarpiškumas, aiškinamosios architektūros

Introduction: Reframing the Question

The Pirahã debate has become one of the most visible and polarising controversies in contemporary linguistics. At its centre lies a cluster of interrelated claims concerning recursion, universal grammar, and the so-called *Immediacy of Experience Principle* (IEP). Everett's proposal that Pirahã grammar lacks recursive embedding and is constrained by a cultural principle restricting discourse to immediately experienced events has been interpreted by some as a direct challenge to the universality of recursion and to core assumptions of generative theory (Everett 2005; 2012; 2016). Critics have responded that recursion is a computational property independent of surface embedding and therefore cannot be refuted by the absence of particular constructions in a given language (Nevins et al. 2009; van der Hulst 2010; Levinson 2013; Legate et al. 2014; Paternoster 2015; Amaral et al. 2018; Dékány 2019; Sauerland 2017). What initially appeared to be an empirical dispute over a small Amazonian language has thus developed into a confrontation between culture-first and computation-first models of language.

The dominant framing of this controversy has been deceptively simple: does Pirahã have recursion? Under this formulation, the debate becomes a question of structural diagnostics, corpus interpretation, and the proper definition of embedding and recursion (van der Hulst 2010; Kornai 2014; Futrell et al. 2016; Sauerland 2018; Everett & Gibson 2019; Kocab et al. 2023). Either recursion is present but theoretically reanalysed, or it is absent and therefore disruptive for universalist accounts. In both cases, the argumentative energy is directed towards adjudicating a binary empirical claim. The status of the IEP is treated as secondary: either as a cultural explanation for a structural fact (Everett 2005; Caldwell-Harris & Everett 2025) or as an insufficient causal hypothesis unable to displace a universal computational mechanism (Nevins et al. 2009).

At the same time, the debate has also persisted because the empirical record itself remains contested. Much of the discussion relies on a limited body of Pirahã data, especially materials collected and analysed by Everett, and these data have been interpreted in conflicting ways. Nevins et al. (2009) challenged Everett's analysis of embedding and hypotaxis, while Sauerland (2017; 2018) introduced experimental evidence for complex syntax and speech-report comprehension in Pirahã. Subsequent reassessments have continued to dispute both the interpretation of the available data and the experimental designs used to test them (Everett & Gibson 2019; Gibson 2024; Gibson & Poliak 2024). The present article therefore does not deny the empirical dimension of the controversy; rather, it examines how empirical disagreement becomes embedded within broader epistemological frameworks.

A recent systematic review of the literature on Pirahã (Horák et al. 2023) has shown that contemporary research is structured around a limited set of recurring problematics, most notably, recursion and numerical cognition, while also revealing ongoing methodological and epistemological tensions. The present study extends this line of inquiry by moving beyond descriptive synthesis towards a reconstruction of the epistemological architectures that underlie the debate. These tensions suggest that the controversy may not be exhausted by empirical disagreements alone, but that it rather reflects deeper uncertainties about the conceptual foundations of the debate, a conclusion that is also consistent with more recent reassessments of the Pirahã debate (Gibson & Poliak 2024).

This article does not claim that the empirical question of recursion depends on the IEP. The presence or absence of syntactic recursion in Pirahã can be investigated independently through structural diagnostics, corpus evidence, and competing definitions of recursion. Rather, the article asks a complementary question: how is 'experience' conceptualised when it is invoked as an explanatory principle in interpretations of Pirahã? When immediacy of experience is said to constrain grammar, what ontological and epistemological commitments are presupposed? Is experience understood as perceptual input, as a culturally regulated evidential norm (Everett 2005; Levinson 2013), as a developmental stage (Oesterdiekhoff 2018), or as a formally bracketed evidential domain within methodological models (Lobina 2014)? The debate repeatedly mobilises 'experience' as explanans without clarifying its theoretical status.

The central thesis advanced here is that immediacy of experience is an epistemologically constructed category whose meaning shifts with explanatory priority – whether culture, computation, development, method, or ontology is taken as foundational. This does not

imply that experience is more fundamental than recursion, but rather that it constitutes an underexamined dimension through which the epistemological assumptions of the recursion debate become visible. By shifting attention from recursion as a structural property to experience as an epistemological construct, the article reorients the debate from grammatical architecture to the theory of knowledge embedded within linguistic theory itself.

Methodologically, the article is based on a systematic qualitative literature review of publications indexed in the Web of Science Core Collection. The database was searched by using an *All Fields* query combining the keywords 'recursion' and 'Pirahã', with the document type restricted to *Article*. The retrieved records were screened manually for direct relevance to the Pirahã recursion debate, including works addressing recursion, embedding, the Immediacy of Experience Principle, cultural constraint, universal grammar, or the epistemological implications of the controversy. Publications that did not substantively address both Pirahã and recursion were excluded. During the full-text screening, additional Web of Science-indexed articles directly addressing the Pirahã recursion debate and identified through the reference lists of the retrieved publications were also included to ensure conceptual completeness of the qualitative synthesis. The final corpus comprised 25 publications. References cited elsewhere in the article but not included in this corpus were used only to provide empirical, theoretical, historical, or contextual background. This includes influential contributions (e.g., van der Hulst 2010; Sauerland 2017; 2018; Gibson & Poliak 2024) that were not part of the systematically analysed corpus but are cited to contextualise the broader scholarly debate.

Each publication was analysed by using a structured analytical protocol. For every text, an analytical card was prepared, including the full bibliographic reference, type of contribution, central thesis, position on recursion, treatment of cultural constraint and universal grammar, conception of experience, epistemological assumptions, relevance for linguistic relativity, and conceptual tensions. Key passages were extracted to anchor the interpretation in textual evidence. Because several publications contributed to more than one dimension of the debate, multiple analytical assignments were permitted during coding. For purposes of presentation, Table 1 lists each publication according to its dominant analytical classification.

Table 1. Analytical coding of the publications included in the qualitative synthesis (source: own processing)

Study	Experience	Epistemological cluster	Architecture	Position on recursion
Nevins et al. (2009)	Data	Generative Rebuttal	Computational–Universalist	Universal recursion
Zwart (2011)	Data	Generative–Computational	Computational–Universalist	Derivational layering
Kornai (2014)	Data	Information–Theoretic	Methodological–Formal	Recursion unnecessary for communicative adequacy

Study	Experience	Epistemological cluster	Architecture	Position on recursion
Legate et al. (2014)	Data	Generative Rebuttal	Computational–Universalist	Recursion independent of embedding
Lobina (2014)	Data	Conceptual Hygiene	Methodological–Formal	Recursion ≠ embedding
Mota (2015)	Data	Formal–Conceptual Clarification	Methodological–Formal	Conceptual distinction
Paternoster (2015)	Data	Generative–Computational	Computational–Universalist	Explanatory necessity of recursion
Cho et al. (2016)	Data	Experimental Learnability	Computational–Universalist	Gradual acquisition
Futrell et al. (2016)	Data	Corpus–Formal Empiricist	Methodological–Formal	No unambiguous embedding
Dékány (2019)	Data	Generative–Computational	Computational–Universalist	Universal computational recursion
Everett & Gibson (2019)	Data	Review–Critical Generative	Methodological–Formal	Structural diagnostics
Johnson-Laird et al. (2022)	Data	Computational–Cognitive Function	Computational–Universalist	Computable recursion
Kocab et al. (2023)	Data	Experimental Emergence	Computational–Universalist	Emergent recursive structures
Everett (2009)	Norm	Empiricist–Culturalist	Cultural–Pragmatic	IEP constrains recursion
Everett (2012)	Norm	Cultural–Functional Consolidation	Cultural–Pragmatic	Recursion not necessary
Levinson (2013)	Norm	Interactionist–Pragmatic	Cultural–Pragmatic	Pragmatic recursion
Everett (2016)	Norm	Anti-UG Cultural–Empiricist	Cultural–Pragmatic	Pirahã challenges Universal Grammar
Verhoeven & Lehmann (2018)	Norm	Register Variation	Cultural–Pragmatic	Context-dependent embedding
Caldwell-Harris & Everett (2023)	Norm	Empiricist–Culturalist	Cultural–Pragmatic	Cultural constraint
Chernela (2023)	Norm	Anthropological–Contextual	Cultural–Pragmatic	Contextual critique
Vrhel (2009)	Norm	Anthropological–Historiographic	Cultural–Pragmatic	Mediating position
Bolender (2007)	Structure	Russellian Paleocognition	Ontological–Phenomenological	Cognition by description
Coolidge et al. (2011)	Structure	Evolutionary–Conceptual	Ontological–Phenomenological	Domain-general cognition
Oesterdiekhoff (2018)	Structure	Developmental–Cognition	Ontological–Phenomenological	Developmental emergence
Sawyer (2025)	Structure	Phenomenological Recursive Selfhood	Ontological–Phenomenological	Self-modelling

Table 1 lists all 25 publications included in the qualitative synthesis. Each publication was coded according to its conception of experience, epistemological cluster, explanatory architecture, and principal position on recursion. Due to the fact that several publications informed more than one dimension of the synthesis, multiple analytical assignments were permitted during coding. For reasons of clarity, the table presents the dominant classification of each publication. References cited elsewhere in the manuscript but not listed in this table were used only as theoretical, historical, or contextual background and were not part of the qualitative corpus.

Where publications included in the corpus did not focus exclusively on both Pirahã and recursion, they were retained only when they contributed directly to one of the four analytical dimensions used in the synthesis. For example, Caldwell-Harris and Everett (2025) was used to contextualise the cultural and evidential logic of the IEP, whereas Cho et al. (2016) was used to clarify experimental and cognitive approaches to recursive learning. Such publications were coded only for the dimensions to which they substantively contributed.

The coded material was then synthesised into the comparative matrix presented in Table 2 (Experience × Epistemology × Recursion × Relativity). The matrix is not a predefined typology or deterministic classification, but an interpretive synthesis of recurring patterns identified across the reviewed corpus. It shows how different conceptions of experience correspond to distinct epistemological orientations, positions on recursion, and implications for linguistic relativity. The three ontologies of experience and four explanatory architectures discussed below were derived from this comparative synthesis.

Table 2. Comparative matrix derived from the qualitative synthesis (source: own processing)

Experience	Epistemological orientation	Dominant explanatory architecture	Position on recursion	Implication for linguistic relativity
Experience as data	Computational realism; methodological formalism; competence-first explanation	Computational–universalist / methodological–formal	Recursion is treated as a computational or formally defined property independent of surface embedding.	Relativity is rejected or bracketed at the level of core grammar; variation concerns performance, evidence, or diagnostics.
Experience as norm	Pragmatic empiricism; cultural functionalism; discourse-centred explanation	Cultural–pragmatic	Recursion is contingent, emergent, or pragmatically constrained by communicative ecology and evidential norms.	Moderate weak relativity: cultural and discourse norms may shape the salience or distribution of grammatical structures.
Experience as structure	Phenomenological structuralism; ontological modelling of cognition; developmental/evolutionary naturalism	Ontological–phenomenological	Recursion is interpreted as an infrastructural capacity enabling abstraction, self-modelling, or cognition by description.	Structural weak relativity: grammar may reshape experiential horizons without determining cognition.

Experience	Epistemological orientation	Dominant explanatory architecture	Position on recursion	Implication for linguistic relativity
Experience as methodologically operationalised evidence	Corpus formalism; conceptual clarification; diagnostic empiricism	Methodological–formal	Recursion is treated as model-dependent, requiring clarification of the level at which it is defined: rule, structure, embedding, corpus pattern, or formal complexity.	Relativity remains secondary to definitional clarity; variation is compatible with different formal descriptions.

Table 2 presents the comparative matrix developed from the analytical coding shown in Table 1. It summarises how different conceptions of experience correspond to distinct epistemological orientations, explanatory architectures, positions on recursion, and implications for linguistic relativity. Rather than representing a predefined typology or deterministic classification, the matrix constitutes an interpretive synthesis of recurring patterns identified across the reviewed corpus. The three ontologies of experience and four explanatory architectures discussed in the following sections were derived from this comparative synthesis.

This layered procedure – including systematic corpus selection, structured analytical coding, and comparative synthesis – distinguishes the reviewed corpus from the broader theoretical literature and makes explicit how the article's interpretive categories were derived from the analysed publications. The following section therefore begins with the first level of synthesis: the ontological status assigned to experience across the Pirahã debate.

Three Ontologies of Experience

The comparative matrix presented in Table 2 summarises the qualitative synthesis derived from the analytical coding shown in Table 1. It reveals that the Pirahã debate is structured not merely by competing empirical claims about recursion, but by divergent ontologies of experience. Across the literature, 'experience' appears in three systematically distinct roles. It is treated either as empirical data external to linguistic competence, as a culturally regulated evidential norm shaping discourse, or as a structurally constituted horizon within which abstraction and reflexivity become possible. Each of these positions corresponds to a different explanatory hierarchy: computation-first, culture-first, or structure-first. What varies is not only the status of recursion, but the epistemological rank assigned to experience itself.

Experience as data designates a position in which experience is reduced to input, performance, or corpus evidence, and is therefore external to the core explanatory architecture of language. Within generative and computational approaches, the decisive distinction is that between competence and performance. Recursion is posited as a property of the computational system itself, independent of the contingencies of attested usage (Nevins et al. 2009; Legate et al. 2014; Dékány 2019; Amaral et al. 2018). On this view, the absence

of overt embedding in Pirahã cannot falsify the presence of a recursive structure, since recursion resides at the level of a generative procedure rather than a surface form. Even corpus-based or information-theoretic analyses, while methodologically more modest, operationalise experience as annotated data to be measured and modelled (Kornai 2014; Futrell et al. 2016). In all such cases, 'immediacy' becomes either a limitation of observable evidence or a feature of usage patterns, and not a constitutive dimension of cognition. Experience is epistemically subordinate. It provides material for testing hypotheses, but it does not determine the architecture of the linguistic faculty. The explanatory hierarchy thus runs from computation to data, and any appeal to experiential restriction is interpreted as a performance-level phenomenon.

Experience as norm reconfigures the explanatory order by treating experience not as raw input but as a culturally regulated evidential constraint. In Everett's formulation of the IEP, discourse is restricted to events that have been personally witnessed or reliably reported by living interlocutors (Everett 2005; 2012; Caldwell-Harris & Everett 2025). Experience here functions as a socially stabilised warrant: what counts as sayable is filtered through norms of evidential legitimacy. This orientation is not merely descriptive but regulative, shaping narrative depth, abstraction, and possibly structural preferences. Related usage-based and interactional approaches likewise suggest that structural complexity is variably realised across communicative settings, so that reduced embedding in discourse need not imply architectural absence (Levinson 2013; Verhoeven & Lehmann 2018). Under this ontology, immediacy is neither perceptual rawness nor cognitive deficit; it is a normative horizon delimiting acceptable discourse. Recursion, accordingly, becomes contingent or emergent. It may be modulated, marginalised, or rendered unnecessary within a cultural ecology that privileges direct experiential reference. Experience is thus not pre-theoretical but institutionally organised, embedded in practices that mediate what is recognised as knowledge.

Experience as structure departs more radically from both data-oriented and norm-oriented models by interrogating the ontological status of experience itself. From a phenomenological perspective, experience is never given as unstructured immediacy but always already articulated within a horizon of significance. The distinction between acquaintance and description, or between pre-reflective presence and reflective articulation, suggests that abstraction is not simply added to experience but, instead, arises from structural transformations within it. On this account, recursion is not merely a syntactic device but an infrastructural capacity enabling reflexivity, self-modelling, and higher-order representation (Bolender 2007; Coolidge et al. 2011; Sawyer 2025). Even evolutionary reconstructions that link recursive capacity to domain-general cognitive mechanisms implicitly presuppose a structured field of experience in which abstraction becomes possible (Coolidge et al. 2011). Immediacy, therefore, cannot be equated with a primitive cognitive stage; it designates a mode within a stratified experiential architecture. To invoke 'immediate experience' as explanatory ground is already to operate within a theoretical framework that distinguishes levels of articulation, presence, and representation. In this sense, experience functions neither as neutral datum nor solely as a cultural norm, but as a structurally mediated condition whose interpretation depends on prior ontological commitments.

From Ontologies to Architectures

It has been demonstrated that 'experience' is not a neutral descriptive term but an ontologically stratified concept whose meaning shifts across theoretical frameworks. Yet, ontologies of experience do not operate in isolation. They are embedded within broader explanatory architectures that determine what counts as foundational in linguistic theory. Once these architectures are made explicit, the Pirahã debate no longer appears as a dispute about a single structural feature, but as a clash of explanatory priorities. What differs is not simply whether recursion is present, but which level – culture, computation, method, or structure – is granted theoretical primacy.

The *cultural–pragmatic architecture* assigns explanatory priority to socially organised practice. Here, culture precedes grammar in the order of explanation. The linguistic structure is treated as responsive to patterns of interaction, evidential norms, and communicative ecology (Everett 2005; 2012; Caldwell-Harris & Everett 2025). The IEP is interpreted not as a cognitive deficit but as a culturally stabilised discourse constraint. Recursion, within this framework, is neither denied as logically possible nor elevated to defining status; it is regarded as contingent upon cultural utility. Interactional models further reinforce this position by demonstrating that structural complexity may be pragmatically modulated without implying architectural absence (Levinson 2013; Verhoeven & Lehmann 2018). The explanatory hierarchy thus runs from culture to grammar: discursive norms shape structural preferences. Relativity is moderate but real, insofar as cultural organisation can influence the distribution or salience of grammatical forms.

The *computational–universalist architecture* reverses this hierarchy. Here, computation precedes culture in the explanatory order. Recursion is defined as a property of the generative mechanism itself, with Merge being understood as a computable operation, rather than as a property of surface embedding (Nevins et al. 2009; Legate et al. 2014; Paternoster 2015; Amaral et al. 2018; Dékány 2019). Cultural variation may affect performance, but it does not alter the underlying architecture. The absence of overt recursive constructions in Pirahã is therefore interpreted as a surface-level phenomenon, and not as evidence against a universal structure. In this framework, 'experience' is relegated to the status of input or data (it provides material for the computational system but does not determine its design). The explanatory hierarchy runs from mechanism to manifestation. Relativity is rejected at the level of the core grammar: variation does not undermine universality.

The *methodological–formal architecture* shifts attention from ontological claims about recursion to definitional clarity and evidential metrics. Here, explanatory priority lies not in culture or computation as such, but in the level at which concepts are defined and measured (Lobina 2014; Kornai 2014; Mota 2015; Futrell et al. 2016; Everett & Gibson 2019). Recursion becomes a question of formal specification: is it a property of rules, structures, or usage patterns? Disputes over Pirahã are frequently traced to conceptual conflations between embedding and generative capacity. Experience, within this architecture, is operationalised as corpus evidence, formal complexity, or entropy measures. Rather than asserting strong ontological commitments, this position emphasises methodological precision. The debate

is reframed as one about diagnostics and levels of abstraction. Relativity is neither affirmed nor denied outright; it is bracketed as secondary to definitional coherence.

The *ontological–phenomenological architecture* relocates explanatory priority to the structure of experience itself. Instead of asking whether grammar contains recursion, it asks how recursion relates to the constitution of subjectivity and abstraction (Bolender 2007; Sawyer 2025; Johnson-Laird et al. 2022). Recursion is interpreted as an infrastructural mechanism enabling reflective description, self-modelling, and higher-order representation. Experience is not treated as data or norm, but as a stratified horizon within which abstraction emerges. From this perspective, immediacy cannot be equated with cognitive simplicity; it designates a mode within a layered experiential field. The debate over Pirahã is thus reframed as an ontological question concerning the relation between the linguistic form and the experiential structure. Relativity acquires a structural dimension. Grammar may reshape horizons of experience, but only within the constraints of deeper ontological organisation.

Taken together, these four architectures reveal that the Pirahã controversy is less a conflict over evidence than a divergence in epistemological commitment. What is at stake is the priority assigned to culture, computation, method, or structure. The Pirahã case thus functions as a diagnostic site for revealing the architecture of linguistic explanation itself.

Linguistic Relativity Revisited

The preceding analysis has shown that the controversy surrounding Pirahã is not reducible to a dispute about the presence or absence of recursion. It concerns the explanatory status of experience and the hierarchy within which it is positioned. At this point, the debate intersects with a longer tradition in linguistic anthropology and philosophy of language: the question of linguistic relativity. The Sapir–Whorf hypothesis has often functioned as an implicit background to discussions of Pirahã, either as a spectre of determinism to be rejected or as a latent possibility to be cautiously entertained (Sapir 1929; Whorf 2015).

Subsequent reformulations have shifted the focus from strong determinism to more nuanced accounts of the interaction between language, cognition, and culture (Lucy 1999; Gumperz & Levinson 2015). The Pirahã literature itself contributed to this shift through research on numerical cognition, which demonstrated that the absence of exact number words affects performance on exact numerical tasks without implying a general cognitive deficit (Frank et al. 2008a; Frank et al. 2008b). These studies reframed linguistic relativity in terms of cognitive technologies and task-specific linguistic mediation rather than deterministic constraints on thought.

Strong linguistic determinism – notably, the claim that language rigidly determines thought or confines cognition within the limits of the grammatical structure – can be decisively rejected. None of the positions surveyed requires the thesis that Pirahã speakers are incapable of particular forms of abstraction simply because their language lacks certain constructions. Even Everett's cultural-pragmatic account does not entail cognitive impossibility. Rather, it describes discursive preferences and culturally regulated evidential norms (Everett 2005; 2012). This interpretation is further supported by anthropological

critiques that emphasise the socially mediated and non-deterministic character of such claims (Chernela 2023). Likewise, generative approaches explicitly deny that surface variation constrains the underlying computational capacity, while maintaining that recursion operates independently of its overt realisation in discourse (Nevins et al. 2009; Legate et al. 2014). Determinism, in its strong form, therefore, mischaracterises both sides of the debate by attributing to them a rigidity they do not in fact defend.

Yet, the rejection of determinism does not entail the abandonment of all forms of relativity. Evidence from the Pirahã numerical cognition studies illustrates precisely this point. Frank et al. (2008a; 2008b) argue that language functions as a cognitive technology that supports certain forms of symbolic reasoning without constituting the underlying cognitive capacity itself. Their findings therefore align with weak rather than strong versions of linguistic relativity and provide an important empirical complement to the present reinterpretation of the IEP.

A weaker, more defensible version of linguistic relativity can be reformulated in structural rather than causal terms. Language need not determine experience in order to participate in its organisation. Instead, language may function as a stabilising mechanism within a broader experiential field (Levinson 2013; Cho et al. 2016; Verhoeven & Lehmann 2018). Grammatical categories, evidential markers, and patterns of embedding do not create experience *ex nihilo*, but they sediment and regularise modes of attending, narrating, and abstracting. In this sense, language operates as a system of constraints and affordances: it channels the articulation of experience without exhausting its possibilities.

Under this reinterpretation, the IEP can be understood not as evidence for determinism, but as a culturally specific configuration of linguistic mediation. If discourse is normatively restricted to witnessed events, this does not imply that non-witnessed abstraction is cognitively inaccessible. It indicates that certain forms of articulation are institutionally stabilised while others are dispreferred (Everett 2005; Caldwell-Harris & Everett 2025). The same structural insight applies in reverse within computational architectures. Even if recursion is a universal property of the generative mechanism, its manifestation in discourse remains subject to stabilising conventions and pragmatic modulation (Levinson 2013; Verhoeven & Lehmann 2018).

Weak relativity thus emerges as a mediating position between culture-first and computation-first accounts. It neither collapses cognition into grammar nor insulates grammar entirely from experiential organisation but treats language as a dynamic interface in which experiential patterns are sedimented, conventionalised, and transmitted. The Pirahã case, viewed from this perspective, illustrates how different explanatory architectures assign different roles to linguistic mediation in stabilising what counts as experience.

Revisiting linguistic relativity in this way allows the debate to be reconfigured. The question is no longer whether language determines thought, but how language participates in the stabilisation of experiential horizons. Immediacy, accordingly, is neither a cognitive primitive nor a deterministic linguistic effect. It is a category whose meaning is co-constituted within specific cultural, computational, and ontological frameworks. By reconceiving relativity as structural mediation rather than causal determination, the

Pirahã controversy can be situated within a broader philosophical account of the reciprocal relation between language and experience.

The Pirahã Case as a Limit Case

If the preceding chapters have demonstrated that the meaning of 'immediacy' varies according to explanatory architecture, the Pirahã case itself can now be reconsidered in a different light. Rather than treating Pirahã as an anomaly that threatens universal grammar (Chomsky 2015) or as a decisive confirmation of cultural constraint, it may be understood as a limit case: a situation in which theoretical commitments become unusually visible. What appears at first glance to be an empirical puzzle turns out to function as a diagnostic instrument for uncovering deeper ontological assumptions.

From within a computational–universalist architecture, Pirahã is readily absorbed. The absence of overt recursive embedding does not falsify recursion as a property of the generative mechanism (Nevins et al. 2009; Legate et al. 2014). The language becomes a case of surface restriction, performance preference, or alternative structural realisation. Nothing in the data compels abandonment of universality; the architecture remains intact. Pirahã is therefore not an exception but a variation whose interpretation is guided by prior commitments about the autonomy of computation.

From within a cultural–pragmatic architecture, the same facts receive a different interpretation. The IEP is treated as a discursive norm regulating the articulation of knowledge (Everett 2005; 2012). The relative scarcity of embedding or abstraction reflects a cultural ecology in which direct experiential warrant is privileged. Here again, Pirahã poses no anomaly. It exemplifies how grammar and discourse may stabilise particular modes of evidential reference. The data are coherent within a culture-first explanatory order.

Methodological–formal approaches likewise neutralise the sense of anomaly by shifting attention to definitional precision. Disputes about recursion often hinge on conflations between embedding and generative capacity (Lobina 2014; Futrell et al. 2016). Once levels of abstraction are disentangled, Pirahã becomes a test case for diagnostics rather than a threat to theory. The controversy is reframed as a problem of measurement and conceptual clarity.

Finally, from within an ontological–phenomenological architecture, Pirahã illuminates the structural relation between linguistic articulation and experiential horizon. The question is not whether recursion is present, but how modes of articulation relate to forms of abstraction and reflexivity (Bolender 2007; Sawyer 2025). Pirahã does not demonstrate the absence of abstraction; it invites reflection on how abstraction is stabilised and expressed within specific linguistic ecologies.

Across these architectures, a striking pattern emerges: the same limited and contested empirical materials are rendered theoretically coherent in mutually incompatible ways (Nevins et al. 2009; Everett 2005; Sauerland 2017; 2018; Everett & Gibson 2019; Chernela 2023; Gibson 2024). Pirahã does not decisively confirm or refute any single position because the available evidence is both empirically restricted and theoretically mediated. The controversy therefore cannot be resolved by epistemological clarification alone. It persists

partly because the data themselves remain disputed, and partly because their interpretation depends on prior explanatory commitments. What is at stake is not only a single structural feature but also the hierarchy of explanation through which that feature is made meaningful.

The recursion debate, in this light, conceals a deeper ontological issue. When recursion is treated as decisive, it functions as a proxy for questions about universality, abstraction, and the nature of the linguistic faculty. When immediacy is invoked, it serves as a proxy for claims about the status of experience. The dispute is thus displaced: what appears to concern a grammatical property in fact concerns the relation between language and the constitution of knowledge. Pirahã, understood as a limit case, exposes this displacement. The language does not present an empirical anomaly so much as a theoretical mirror, reflecting the architecture within which it is interpreted.

Seen in this way, the Pirahã debate neither undermines universal grammar nor vindicates strong relativism. Instead, it illustrates a broader epistemological phenomenon: empirical evidence is often interpreted through prior theoretical commitments. This theory-ladenness is not unique to the Pirahã debate, but the case makes it unusually visible because the empirical record is limited, contested, and theoretically consequential. The apparent conflict over recursion therefore also reveals a disagreement about the explanatory hierarchy and the ontological status of experience. To recognise Pirahã as a limit case is therefore to recognise that additional empirical data, although essential, are unlikely by themselves to resolve the controversy. Progress also requires clarification of the explanatory assumptions through which such data are interpreted.

Conclusions

The Pirahã debate has often been presented as a decisive confrontation between universal grammar and cultural constraint, between recursion as a computational invariant and recursion as an empirically contingent feature. Yet the analysis developed in this article has shown that such framing obscures the deeper structure of the disagreement. The controversy persists partly because the available data remain limited and contested, and partly because the status of experience within linguistic explanation remains theoretically unsettled.

Through a systematic comparative analysis of the literature, three ontologies of experience and four explanatory architectures have been identified. Within each of them, ‘immediacy’ acquires a different function: as empirical input, as a culturally regulated norm, as a methodological construct, or as a structurally constituted horizon. These differences are not superficial variations in terminology; they reflect distinct hierarchies of explanation. Once these hierarchies have been made explicit, the Pirahã case ceases to appear as a singular anomaly and instead reveals itself as a site at which competing epistemological commitments become visible.

Revisiting linguistic relativity in this context further clarifies the stakes. Strong determinism proves untenable, yet a structural form of weak relativity remains indispensable. Language neither mechanically determines thought nor floats free from experiential organisation. Rather, it operates as a stabilising mechanism within a dynamic field of mediation. The IEP, accordingly, cannot be treated as evidence for cognitive primitiveness

nor dismissed as a mere descriptive curiosity. It must be situated within the explanatory architecture that renders it meaningful.

The central claim of this study may therefore be stated plainly: immediacy of experience is a theoretical placeholder whose meaning shifts with explanatory priority. What appears as an empirical constraint in one framework becomes a performance effect in another, a methodological artefact in a third, and an ontological horizon in a fourth. The debate over Pirahã thus exemplifies, rather than uniquely embodies, the limits of unexamined theoretical presuppositions.

If the controversy is to advance beyond recurrent cycles of refutation and counter-refutation, the empirical question of recursion and the epistemological question of experience should be kept analytically distinct. The former concerns the structural and formal analysis of Pirahã grammar; the latter concerns how linguistic theory conceptualises the relation between language, experience, and explanation. The present article does not resolve the empirical recursion debate, nor does it treat the IEP as a prerequisite for resolving it. Rather, it shows that the IEP and related notions of experience reveal the explanatory assumptions through which the Pirahã case is interpreted.

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