Resolving the Tension: Metaphor and Literalism in Quine's Philosophy of Science

1. Introduction: The Apparent Tension in Quine's View of Metaphor

Willard Van Orman Quine stands as a towering figure in twentieth-century analytic philosophy, whose work profoundly reshaped the landscapes of logic, epistemology, philosophy of language, and ontology.[1] Central to his philosophical outlook is a thoroughgoing naturalism, the view that there is no higher tribunal for truth than science itself, and consequently, a rejection of any "first philosophy" standing prior to or above scientific inquiry.[5] Within this naturalistic framework, Quine approached philosophical problems with a characteristic demand for clarity and empirical accountability.

It is precisely this demand for clarity, particularly in the context of scientific theorizing, that gives rise to an apparent tension concerning his views on metaphor. On the one hand, Quine famously cautioned against the pitfalls of figurative language, suggesting that the rigorous, "inner stretches of science" require the "clearing away" of tropes in favor of literal, precise discourse.[9] This aligns with his emphasis on ontological commitment, where the entities a theory posits are revealed through the austere, quantified language of first-order logic.[7] Such regimentation seems antithetical to the nature of metaphor.

On the other hand, Quine explicitly acknowledged the crucial role of metaphor, stating it is "particularly vital 'at the growing edges of science'".[10] This suggests metaphor is not merely a decorative element or an impediment to knowledge, but an essential tool for scientific progress, especially when venturing into uncharted conceptual territory. How can a linguistic device deemed potentially misleading and ideally eliminated from mature science simultaneously be indispensable for its advancement? This apparent contradiction forms the central query of this report.

This analysis aims to resolve the seeming tension by demonstrating that Quine assigns distinct, context-dependent roles to metaphor and literal language within his broader philosophical framework. The apparent conflict dissolves when one recognizes that these assessments apply to different stages and functions within the continuous, evolving enterprise of language acquisition and scientific inquiry. Quine's position, it will be argued, is not contradictory but reflects a nuanced understanding of how language functions both as a tool for discovery and exploration and as a vehicle for the precise statement of established knowledge and its ontological implications. The subsequent sections will explore metaphor's foundational role in the genesis of language and concepts, its heuristic power in scientific discovery, the contrasting drive towards literalism for ontological clarity in mature science,

and ultimately, the reconciliation of these distinct functions within Quine's naturalistic and holistic philosophy. The investigation suggests that the perceived contradiction arises from overlooking the specific domains of application – language acquisition versus mature science, discovery versus justification – to which Quine's respective statements about metaphor's value are directed. His view, consistent with his broader philosophy, evaluates linguistic tools based on their function and efficacy within the ongoing, natural process of human knowledge-seeking.

2. Metaphor's Genesis: Language Acquisition and Conceptual Growth

Quine's perspective on metaphor extends beyond its rhetorical or scientific uses; it reaches into the very foundations of language acquisition. In his essay "A Postscript on Metaphor," Quine presents an account where metaphor, or a process fundamentally akin to it, is not an embellishment added to a pre-existing literal linguistic framework, but rather an integral part of how language is learned and grows.[10] He argues that our initial grasp of words involves associating sounds with specific occasions. Subsequently, we extend the use of these words to new occasions based on a perceived similarity or resemblance to the original ones. This act of extension, driven by analogy based on subjective resemblance, is the crux of the process.[10] This reliance on resemblance is fundamental. As other analyses note, we are often forced to understand and communicate new experiences by applying terms previously used for different things, based on some perceived similarity.[15] This analogical reasoning allows a finite set of linguistic tools to be applied across a potentially infinite range of situations, enabling comparison, comprehension, and communication.[15] Quine's account highlights this very mechanism at the root of language learning: "Resemblance of occasions is what matters, here as in metaphor".[10] We generalize the application of a term by degrees of subjective resemblance, gradually refining our usage through social feedback, learning where the analogy holds and where it "exceeded the established usage".[10]

Quine characterizes these initial, analogical extensions as "metaphors stillborn".[10] Unlike deliberate, sophisticated metaphors employed by mature language users, these primitive extensions immediately become part of the learner's standard vocabulary, contributing directly to the growing store of literal usage. Each successful application based on resemblance effectively forges a metaphor, but one that is instantly absorbed into the literal fabric of the developing language.[10] This perspective challenges the traditional view that often regards metaphor as secondary, derivative, or merely aesthetic.[16] Instead, Quine suggests, "It is a mistake, then, to think of linguistic usage as literalistic in its main body and metaphorical in its trimming. Metaphor, or something like it, governs both the growth of language and our acquisition of it".[10]

This account implies a developmental continuum rather than a sharp dichotomy between the literal and the metaphorical, at least in the genesis of language. The literal emerges dynamically from these initial metaphorical or proto-metaphorical extensions through repeated use, social correction, and eventual conventionalization.[10] This contrasts sharply

with views that posit a fixed, inherent distinction between literal meaning (determined prior to context) and non-literal deviations.[17] While contemporary debates continue regarding the theoretical utility of the literal/figurative distinction in analyzing communication [9], Quine's focus in "Postscript" is on the *origins* and *development* of linguistic competence. His argument naturalizes metaphor, integrating it into the observable, empirical process of how humans learn to navigate the world with language. This aligns seamlessly with his broader naturalistic epistemology, which seeks to understand knowledge acquisition using the resources of science itself.[5] The process Quine describes – based on observation (hearing words used), association (perceiving resemblance between occasions), and feedback (social correction) – portrays metaphorical extension not as a mysterious deviation but as a core component of this natural learning curve.

Furthermore, the concept of "metaphors stillborn" underscores the dynamic and historical nature of the boundary between literal and metaphorical usage. What functions as a novel metaphorical extension at one point can, through acceptance and repeated use, become sedimented into the language as standard, literal meaning.[16] This implies that the pool of literal meanings is not static but expands over time by absorbing these initially figurative extensions. This historical perspective shifts the focus from a potentially elusive, ahistorical definition of "literal meaning" towards understanding patterns of current usage – distinguishing perhaps between uses intended to conform to established practice and uses that deliberately deviate while depending on that practice.[9] Quine's developmental account thus provides a naturalistic basis for understanding how literal language itself arises, viewing it as a refinement emerging from a more fluid, analogy-driven initial phase.

3. The Heuristic Power: Metaphor at the "Growing Edge" of Science

Beyond its role in language acquisition, Quine identifies metaphor as playing a critical, functional role within the scientific enterprise itself, particularly "at the growing edges of science".[10] This assertion positions metaphor not as an anomaly in scientific discourse but as an essential tool for progress, especially when scientists confront novel phenomena or attempt to formulate radically new theories. Its vitality stems from its heuristic function: its capacity to guide discovery and structure understanding in domains where established concepts and literal terminology prove inadequate.

Metaphor allows scientists to bridge the gap between the known and the unknown. By drawing analogies between unfamiliar phenomena and more familiar concepts or experiences, metaphors provide a preliminary conceptual scaffold.[15] They help to "body forth the forms of things unknown" [15] and can act as "midwives in the birth of new concepts".[23] This cognitive function involves mapping structures and relationships from a source domain onto a target domain, thereby making abstract or poorly understood concepts more concrete and tractable.[16] This "creative extension through analogy" is the same mechanism Quine identified in language acquisition, now deployed consciously or unconsciously in the sophisticated context of scientific investigation.[10] Indeed, the history of science offers numerous examples

where novel comparisons and metaphorical frameworks initiated significant theoretical shifts.[22]

This heuristic role can be situated within Quine's broader epistemological framework, particularly his concept of the "web of belief".[7] Science, for Quine, is a holistic system of interconnected beliefs, constantly adjusting to accommodate new experiential data.[5] When "recalcitrant experiences" challenge the existing web, or when scientists explore entirely new theoretical possibilities, revisions are necessary. Metaphor can facilitate this process. Before precise, literal formulations are available, metaphors can suggest new connections, reframe problems, or provide tentative models for understanding phenomena that resist explanation within the current framework.[23] This exploratory function aligns with Quine's principle of "minimum mutilation" in belief revision.[24] Faced with the need to adjust the web of belief, especially at its periphery or in undeveloped areas, employing metaphor allows for the exploration of new conceptual structures using existing linguistic resources analogically. This can be a less disruptive initial step than attempting to introduce entirely new, precisely defined terms and axioms prematurely, thus helping to maintain the overall coherence of the system while probing potential modifications.

This necessity of metaphor at the frontiers underscores the limitations of purely formal or logical methods in the *initial* stages of scientific discovery. Quine's naturalism views science as a human, empirical activity, evolving through interaction with the world, not merely as a process of logical deduction from fixed axioms.[5] The "growing edge" represents the point of most intense interaction with the novel and poorly understood aspects of that world. Formal logic requires well-defined concepts and clear structures, which are often precisely what is lacking at the frontiers. Metaphor, drawing on broader human experience, analogy, and the ability to perceive similarities [10], provides a pre-formal, flexible means to grapple with this novelty and impose a preliminary structure on experience. The scientific process, understood naturalistically, thus incorporates such non-formal, metaphorical phases as a necessary precursor to eventual formalization and literal expression.

However, this heuristic power is not without risks. The very features that make metaphor useful for exploration – its reliance on analogy, its potential ambiguity, its context-dependence – also make it potentially misleading if taken too literally or applied too rigidly.[16] A metaphor that proves fruitful in one context might constrain inquiry or lead to misunderstandings if its limitations are not recognized.[22] This inherent imprecision and potential for misinterpretation foreshadows Quine's contrasting emphasis on literalism in the context of established scientific theories and ontological commitment.

4. The Pursuit of Clarity: Literalism and Ontological Commitment in Mature Science

In stark contrast to the essential role assigned to metaphor at the frontiers of inquiry, Quine describes the "neatly worked inner stretches" of mature science as involving a process of refinement where figurative language is deliberately "clearing tropes away".[9] This represents a move towards "cognitive discourse itself, at its most dryly literal".[10] This pursuit of literalism is

not merely a stylistic preference but is deeply motivated by the aims of established science: achieving clarity, precision, testability, and unambiguous communication.[16] Metaphors, with their inherent reliance on suggestion, context, and subjective interpretation of resemblance, are ill-suited for the rigorous formulation and assessment of well-confirmed scientific theories.

The crucial link between this drive for literalism and Quine's broader philosophy lies in his doctrine of **ontological commitment**. For Quine, a central task of philosophy, continuous with science, is to determine "what there is".[25] His answer is that our ontology is given by our best, most comprehensive scientific theory of the world.[5] However, discerning the precise ontological commitments of a theory expressed in ordinary language can be problematic due to vagueness and ambiguity.[13] To achieve clarity, Quine advocated translating scientific theories into the canonical notation of first-order predicate logic.[7]

Within this regimented language, ontological commitment is made explicit through quantification. Quine's famous criterion states: "To be is to be the value of a variable".[6] A theory is ontologically committed to those entities that must be included in the domain over which its bound variables range for the theory's quantified statements to be true.[7] For example, asserting ' ∃ x Electron(x)' (There exists an x such that x is an electron) within our accepted physical theory commits us to the existence of electrons, as electrons must be among the values of the variable 'x' for the statement to be true.[7]

Metaphorical language fundamentally resists this kind of precise regimentation and ontological accounting. Figurative statements do not typically make claims about the world in the direct, referential way required for quantification.[21] Their truth conditions, if they can be assigned at all, are complex and often depend on pragmatic factors, speaker intentions, and shared associations rather than the literal denotation of the terms used.[16] Consequently, metaphorical utterances are generally considered ontologically non-committal; they do not straightforwardly tell us what entities must exist for them to be "true" in their figurative sense.[27] Using metaphor within the core statements of a scientific theory would therefore obscure, rather than clarify, its ontological commitments. Literal, precise language, amenable to logical regimentation, becomes the necessary vehicle for making these commitments transparent and subject to philosophical scrutiny.[13]

Therefore, Quine's preference for literalism in mature science is not simply about avoiding imprecision in general; it is specifically driven by the requirements of his method for determining ontology. The process of "clearing away tropes" is integral to preparing a theory for ontological assessment. Literal, regimented language is positioned as the *ideal endpoint* or *product* of scientific inquiry, embodying the achieved theoretical understanding and making its existential presuppositions explicit. This perspective aligns with the distinction sometimes drawn between the context of discovery (where heuristics, including metaphor, are valuable) and the context of justification (where rigorous statement, testability, and logical structure are paramount). Metaphor finds its place primarily in the former, while the latter demands the clarity and ontological transparency afforded by literal, quantified language. The warning against conflating metaphor and fact [user query] can thus be understood fundamentally as a warning against ontological confusion – against mistakenly treating the

suggestive, non-committal language of exploration as if it were the precise, committal language required for stating what the theory claims exists.

5. Reconciliation: Distinct Roles in the Scientific Enterprise

The apparent contradiction in Quine's views on metaphor dissolves when we recognize that he assigns different, albeit complementary, functions to metaphorical and literal language based on the specific context and purpose within the overarching scientific enterprise. There is no inherent conflict, but rather a functional differentiation reflecting the dynamic nature of knowledge acquisition and theory development.

Metaphor serves as essential **process** and **scaffolding**. Its role is paramount during the initial stages of language acquisition, where analogy drives the extension of meaning [10], and at the "growing edges" of science, where it functions as a vital heuristic tool for discovery and conceptualization.[10] It is generative, allowing scientists to explore new possibilities, structure nascent understanding, and communicate tentative ideas in domains where precise terminology is yet to be established.[15] In this capacity, metaphor is like scaffolding used during construction: indispensable for building the structure but intended for removal once the edifice is complete. Its value in these exploratory phases stems partly from its flexibility and ontological non-committal nature [27], which permits investigation without premature theoretical or existential lock-in.

Literal language, particularly when regimented into logical form, represents the ideal **product** and **structure** of scientific inquiry.[10] It is the preferred medium for the precise statement of well-understood phenomena and well-confirmed theories within the "inner stretches" of science. Its value lies in its capacity for clarity, unambiguous communication, rigorous testing, and, crucially for Quine, the explicit articulation of ontological commitments through quantification.[13] Mature science strives for literalism precisely because it *is* ontologically committal and allows for the clear assessment of what a theory claims exists.

This functional distinction aligns with Quine's broader philosophical commitments. His use of Neurath's boat metaphor – science as a vessel that must be repaired and rebuilt plank by plank while staying afloat [5] – provides a fitting analogy. Metaphor might be the tool the sailors use to sketch out potential repairs, conceptualize new structural additions, or communicate about unfamiliar waters (the fringes). The final, carefully measured, and securely fastened planks represent the literal, established, and load-bearing parts of the scientific theory (the inner stretches).

The following table summarizes this reconciliation by contrasting the key features and roles of metaphor and literal language as understood within Quine's framework:

Feature/Dimension	**Metaphor**	**Literal Language**
Stage of Language/Science	Genesis/Acquisition; Fringes/Discovery	Refinement; Inner Stretches/Mature Theory
Primary Function	Heuristic; Generative;	Assertoric; Precisification;

	Analogical Extension	Statement of Fact/Theory
Relation to Ontological Commitment	Non-committal; Suggestive [27]	Explicitly Committal (via quantification) [13]
Relation to Truth	Indirect; Evocative; Pre-theoretical [21]	Directly Truth-Evaluable (within theory) [17]
Ideal Form	Figurative; Open-ended	Regimented (First-Order Logic); Precise [13]
Quine's Assessment	Essential for growth/exploration [10]	Ideal for established knowledge/ontology [9]

This reconciliation reflects Quine's underlying pragmatism or instrumentalism regarding conceptual tools.[6] Both metaphor and literal language are evaluated based on their effectiveness for specific tasks within the scientific process. Metaphor is the right tool for the job of exploration and conceptual innovation at the frontiers; literal, regimented language is the right tool for the job of precise formulation, testing, and ontological accounting in established science. Neither mode of language is judged inherently superior across all contexts.

Furthermore, Quine's nuanced position implicitly critiques philosophical stances that might universally champion metaphor as fundamental to *all* rigorous thought (perhaps suggested by some interpretations of cognitive metaphor theory [15]) or, conversely, those traditional views that dismissed metaphor as merely aesthetic or inherently imprecise and thus unsuitable for any serious scientific or mathematical discourse.[16] Quine acknowledges metaphor's foundational role in origins and its indispensability for discovery, yet he retains a critical stance, insisting on its eventual elimination in favor of literalism where ontological clarity is paramount. This context-sensitive approach, grounded in the practical demands of scientific inquiry and the specific requirements of his ontological program, distinguishes his view within the broader philosophical landscape.

6. Conclusion: A Coherent View of Metaphor's Place in Quine's Philosophy

The apparent tension between W.V.O. Quine's caution against conflating metaphor with fact and his acknowledgment of metaphor's vital role at the frontiers of science is ultimately resolved through a careful consideration of context and function. His seemingly divergent statements do not constitute a contradiction but rather reflect a sophisticated, coherent understanding of the diverse roles language plays within the dynamic and evolving process of scientific inquiry.

The analysis reveals a clear functional differentiation:

- **Metaphor** is fundamental to the **genesis** of language and concepts, operating through analogy and resemblance.[10] In science, it serves as an indispensable **heuristic tool** at the "growing edge," enabling exploration, conceptualization, and communication when established literal language is insufficient.[14] It is the engine of discovery, the scaffolding

for new theoretical structures.

- **Literal language**, particularly when regimented into the clear structure of first-order logic, is the **ideal vehicle** for expressing the **product** of scientific inquiry within its mature, "inner stretches".[9] Its value lies in its precision, testability, and unique suitability for making **ontological commitments** explicit through quantification.[13] It is the language of established theory and existential assertion.

This nuanced perspective aligns perfectly with Quine's core philosophical commitments. His **naturalism** is evident in grounding the functions of both literal and metaphorical language in the empirical realities of language acquisition and the practical needs of scientific investigation.[5] His **holism**, represented by the "web of belief" metaphor itself [24], accommodates the idea that different cognitive tools are required at different points as the web adapts to experience – metaphor for tentative exploration, logic for solidifying structure. Most importantly, his insistence on **ontological clarity** as a central goal of philosophy-cum-science explains the drive to "clear away tropes" in favor of literal, quantified language when stating our best theories about what exists.[13]

In conclusion, the initial query arises from viewing Quine's statements about metaphor in isolation, rather than as context-dependent assessments of linguistic tools evaluated according to their utility for specific tasks – discovery versus justification, exploration versus ontological declaration. Quine's position offers a pragmatic and philosophically consistent account that recognizes the power of metaphor to drive conceptual growth while simultaneously upholding the distinct value of literal precision for the rigorous statement and ontological assessment of scientific knowledge. Metaphor is essential for getting science started and pushing its boundaries, while literalism is essential for saying clearly what science, once established, claims about the world.

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