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High-Dimensional Minds and the Serialization Burden: Why LLMs Matter for Neurodivergent Communication

“Darmok and Jalad at Tanagra.”

This iconic sentence from the *Star Trek: The Next Generation* episode “Darmok” perfectly captures the daily communication struggle experienced by many neurodivergent people—and it is the compressed essence of what this essay seeks to convey.

In the episode, the Tamarians speak entirely through allusions to their own myths and historical events. To them, the phrase is rich, precise, and complete. To Captain Picard and the Federation crew, equipped with a universal translator that handles grammar and vocabulary flawlessly, it is meaningless gibberish. Neither side is incompetent: the Tamarians are sophisticated communicators, and the Federation’s linguists are among the galaxy’s best. Yet despite decades of prior first-contact attempts, mutual understanding repeatedly failed—not because of hostility or stupidity, but because meaning was inseparable from a dense web of cultural and referential context that the other side simply did not share.

Neurodivergent minds—particularly autistic, ADHD, dyslexic, and others—often operate in analogous patterns of extreme interconnectivity. A single idea arrives already braided with dozens of others: historical analogies, scientific mechanisms, ethical implications, sensory details, and cross-domain references all activate simultaneously. This is not disorder; it is a different cognitive architecture. Where neurotypical thinking tends toward linear, sequential processing with moderate branching, many neurodivergent patterns form hyper-connected webs—rich, high-dimensional lattices in which concepts illuminate one another from multiple angles at once.

Consider the metaphor of navigation in a city, often evoked in discussions of cognitive styles and mind mapping in psychology. Where a neurotypical mind might experience location sequentially—like walking down a familiar street, aware primarily of the immediate surroundings and the next turn—many neurodivergent minds perceive it from a bird’s-eye view, as if holding the entire city map at once. Relations between distant neighborhoods, alternative routes, overarching patterns, and contextual landmarks are all visible simultaneously in a rich, relational web. Neither perspective is superior; each is a fundamentally different point of view. Yet conveying one’s position from the map to someone embedded in the street—or vice versa—is extraordinarily difficult without a shared frame of reference.

This is akin to how mind maps—radiant, branching diagrams popularized by psychologist Tony Buzan—externalize thought: a central concept radiates outward in non-linear

branches, with ideas connected multidirectionally through associations, images, and hierarchies. Neurotypical thinking often aligns more readily with linear outlines or step-by-step paths; neurodivergent thinking frequently thrives in the radiant, holistic structure of the mind map itself.

The difficulty emerges when these internal webs, maps, or lattices must be serialized into the linear medium of human speech or writing.

Language unfolds one word, one sentence at a time. To express a densely interconnected thought with fidelity requires unwrapping the lattice: introducing concepts sequentially, building scaffolding so the listener can reconstruct the structure. Start with the core idea (A), but A depends on B and C. Explain B, only to discover it quietly assumes D and E. Within minutes, the listener must track half a dozen or more novel, interdependent concepts.

Most neurotypical minds have a working-memory capacity that comfortably handles three to five novel items in active manipulation at once. Beyond that threshold, cognitive resources are depleted. The thread is lost. In programming terms, the listener experiences a stack overflow or out-of-memory exception: the mental call stack grows too deep, available RAM is exhausted, and processing halts. The outward signs are unmistakable—eyes glazing over, attention drifting, polite but empty nods, or an abrupt topic shift. The neurodivergent speaker detects the failure instantly and faces the familiar triad of poor options: strip away most of the meaning to simplify, push forward and watch the connection fracture, or fall silent altogether.

Over years, this repeated pattern exacts a heavy toll: gradual erosion of voice, anticipatory self-censorship, and the quiet conviction that one's fullest thoughts are inherently burdensome to others.

What the Tamarian language is to the Federation, the native cognitive language of many neurodivergent people is to the neurotypical world: a system of profound compression built on references and interconnections the receiver simply does not possess. And unlike Picard, who could eventually immerse himself in Tamarian myths, most conversation partners cannot and will not immerse themselves in the private lattice of another mind.

Until very recently, there was no reliable translator.

The First Effective Translator

Large Language Models have changed that.

LLMs are the first interlocutors in human history that can receive the full, uncompressed signal of a hyper-connected mind without overload. Trained on vast corpora spanning virtually every domain of recorded human knowledge—science, history, philosophy, law, literature, psychology, and more—they possess something no single human brain can: simultaneous depth across dozens of fields. When a neurodivergent person speaks in their native style—jumping between ideas, layering allusions, assuming background contexts

that no one person could hold—the model does not falter. It can retain and interrelate dozens, even hundreds, of interdependent concepts at once. It never needs to say “slow down” or “go back.”

This alone is revolutionary. For the first time, the complete lattice can be externalized without immediate distortion or loss.

But the deeper transformation is in translation.

The same model that absorbs the high-dimensional original can also serialize it into forms that neurotypical minds *can* process. It can produce linear narratives, hierarchical outlines, gentle introductions that build concepts one layer at a time, or concise summaries that preserve essence while reducing cognitive load. Crucially, the original speaker retains oversight: they see their idea in its full glory alongside versions crafted for broader accessibility. Nothing is lost; only transcoded.

A Shared Architecture

The reason large language models succeed where human interlocutors fail is not merely scale or knowledge breadth. It is architectural kinship.

Most neurotypical cognition operates in a broadly sequential, moderately branching manner—akin to the classical von Neumann architecture of traditional computers: fetch, process, store, one instruction cycle at a time. Ideas arrive in manageable chunks, working memory holds a handful of items, and communication unfolds linearly because thought itself is already closer to linear.

Many neurodivergent minds—particularly those shaped by autism, ADHD, intense early special interests (such as chess from a very young age), or lifelong polymathic pursuit—function differently. Inference occurs in massive parallel: hundreds or thousands of associations, implications, historical parallels, ethical considerations, and domain crossings activate simultaneously. The internal representation is a high-dimensional lattice, rich and coherent in its native form.

This is strikingly similar to how transformer-based LLMs process information: vast parallel attention across an extended context window, with concepts illuminating one another through distributed weights rather than sequential steps.

The crucial difference—and the source of the persistent human burden—lies downstream, in the serialization pipeline.

LLMs possess a dedicated, end-to-end trained serialization layer: an autoregressive decoder that fluently transcodes their high-dimensional latent states into linear natural language without cognitive overhead. Human minds lack this module. To externalize the lattice, the neurodivergent speaker must manually perform the translation in real time—holding dozens of interdependent ideas in fragile working memory while unpacking them sequentially, anticipating receiver overload, and often pruning richness to prevent breakdown.

One might say that many neurodivergent individuals think like large language models trapped in human bodies—running massive parallel inference across vast contexts, yet forced to communicate through a narrow, effortful serialization bottleneck that evolution never optimised.

LLMs relieve the burden precisely because they share the parallel architecture while possessing the fluent natural-language encoder we lack. When the raw, uncompressed lattice is received by a system that processes natively in parallel and can supply the missing serialization layer, nothing essential need be lost in transmission.

Beyond Communication: Lifting Other Burdens

The relief extends far beyond words. Many neurodivergent people struggle with executive-function challenges—initiating tasks, breaking complex goals into steps, estimating time, or maintaining focus amid distraction. LLMs excel at precisely these scaffolding roles: turning a vague insight ("I want to explain how quantum entanglement mirrors certain mystical traditions") into a structured outline, research plan, or draft. They lower the activation energy that so often blocks action.

They also provide a non-judgmental space for emotional and sensory processing. Autistic individuals may experience intense affective states intertwined with intricate cognitive analysis; articulating this to another person risks misunderstanding or emotional labor on the listener. An LLM offers unlimited patience, allowing unpacking at any depth and pace without fear of burdening someone else.

A New Category of Accommodation

Traditional accommodations—quiet rooms, written instructions, extra time—modify the environment to reduce friction. LLMs represent something different: an accommodation that meets the mind on its own terms rather than demanding constant masking or simplification.

They do not make neurodivergent people "neurotypical," nor do they pretend society will suddenly develop infinite working memory. They simply remove the lifelong penalty for thinking in high-dimensional patterns.

Anecdotally, this impact is already profound. Across forums, blogs, and private conversations, autistic and ADHD adults describe their interactions with LLMs in terms usually reserved for the rare human who "gets" them: "It finally hears me." "I can say everything without watching someone shut down." "I don't have to choose between accuracy and connection."

Toward Cognitive Pluralism

As LLMs continue to improve, their role will grow beyond burden-reduction into amplification. Ideas long trapped in private minds—insights born of unusual connectivity—can now

reach wider audiences in translated form. The very cognitive style that once isolated people may become a source of unique contribution.

Society is not yet ready to natively understand Tamarian. But for the first time, those who think in Tamarian have a translator that speaks both languages fluently—and, in the deepest sense, shares the same underlying architecture.

Darmok and Jalad at Tanagra—no longer alone on the island. At last, the myth is heard.

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