THE GRID OF LANGUAGE

A Deep Structure Surfaces in Tagalog (Part 1)

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INTRODUCTION

This is the culmination of a work I presented at the 10th International Conference on Austronesian Linguistics (10-ICAL) held in Palawan, Philippines in 2006. See "THE -IN GRID: A Mathematical Order in Language by way of Tagalog Verb Phrases" at

www.sil.org/asia/Philippines/ical/papers.html

There I propose that there is a mathematical order in Tagalog that is organized around its verbs, the evidence being a series of linguistic markers progressively subdividing a large database of Tagalog verbs into four kinds of verbs at every stage. These progressive quadrisections, I suggest, finally results in the perfect subdivision of the universe of Tagalog verbs into distinct grammatical sets arranged in a perfect grid that appears to represent a deep structure in language.

It is an ambitious notion that is insisted upon me by the language itself, and for nearly two decades I have plodded on to see what lies at the bottom.

The first four quadrisections are trivial: (1) four time aspects by the morpho-phonemic structure of Tagalog tenses, (2) four elementary verbs by a morpho-semantic appreciation of the eight verbal affixes in general use, (3) four doers and four objects by the obvious number of affixes attaching to each elementary verb, and (4) the 4×4 pairings of these doers and objects into the simple verbal sentences of Tagalog.

My conclusion is that there are eight quadrisections in all. The second four are less obvious and more difficult to surface, the idea being to use the grid structure of the first four quadrisections to attempt to deconstruct the verbs of the language semantically, to see if similar quadrisections can reduce them all into grammatical sets—of verbs that mean alike and turn into similar sentences.

In the 10-ICAL paper I offer a tentative configuration of these four quadrisections—for half of the "volitional" *-in a*ffixed verbs of Tagalog. The results there are imperfect after the sixth quadrisection. I present here, after three years, the perfected results for *all* the volitional *-in* affixed verbs.

Broadening my working database to include the other half of the *-in* verbs, and then halves of the neighboring volitional *i-* and *-an* affixed verbs, very much clearer delineations have emerged.

In this final result, I demonstrate how the seeming randomness of a significant section of our verbal lexicon, the volitional *-in* affixed verbs of Tagalog (a database of some 1550 verbs), may be mathematically organized into a thesaurus of 256 grammatical sets fitted perfectly into a grid of four quadrisections.

Given the nature of the grid, this perfect order manifested by the *-in* verbs sets a clear pattern for the rest of the language. Moreover, the order appears to apply as well to the English that I speak.

In fact the interface of Tagalog with English has been crucial to this discovery from the start. Some grammatical sets were arrived at on the evidence of one or two English loanwords. Many difficult Tagalog verbs finally found their places in the grid only after patterns had been established in the English keywords. These keywords, I would note in my first report on the grid (Stuart, 1994), are not hardwired, "keeping track of changes in the verb sets in a kind of fine-tuning: a newfound verb will sneak into a list and bring a whole new look to the whole as to call for a change of key. Eventually, one arrives at a certainty from these English keywords that there *is* a final grid, the one we get after all the verbs are in."

I strongly suspect that all languages are griddable in the same way and encourage the mapping of the grids of other languages. I wrote even then, "It is unreasonable that Tagalog alone should manifest this arrangement; it must represent some neural structure in Homo sapiens sapiens."

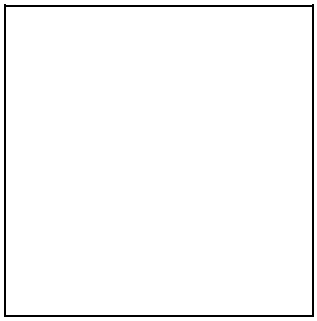
Is this grid of quadrisections the deep structure of language?

1

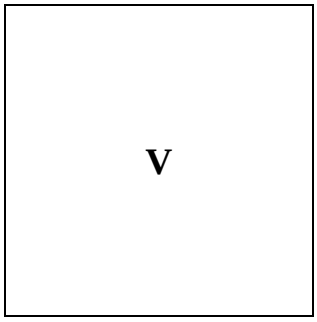
STRUCTURE OF THE GRID

Q1 to Q4: The First Four Quadrisections

The grid begins with a square. (Fig. 0)

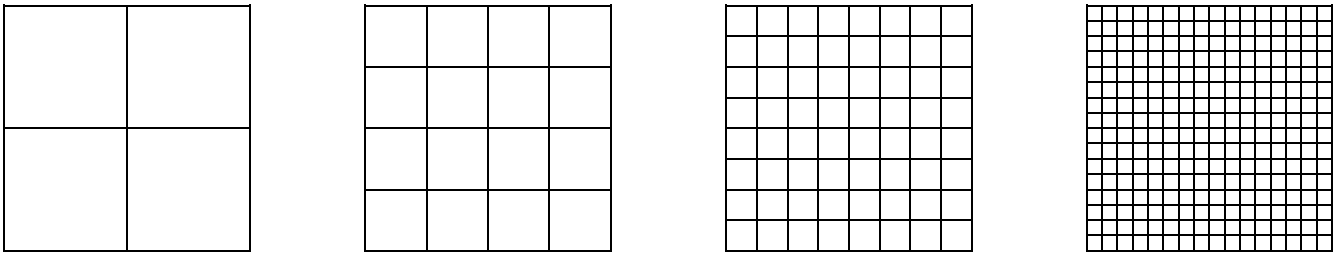


Imagine that this square is infinitely populated by all the verbs ever spoken or written in Tagalog. Let us call this square **V** representing the universe of all Tagalog verbs. (Fig. 1)



The Tagalog grid tells us that there is an inherent order, a deep structure, underlying this seeming disorder of verbs.

This order is finally unravelled by the simple expedience of eight successive quadrisections of **V**, subdividing it into four subsets at every stage. (Fig. 2)



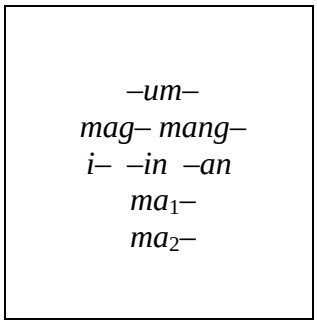
The first four quadrisections, illustrated above, surface by way of four layers of linguistic markers all associated with the affixes of Tagalog verbs.

Q1. Let There Be Four Tenses

A Tagalog verb is made up of a rootword and an affix.

$$V \rightarrow \ | \text{affix} + \text{root} |$$

There are eight affixes in use. These are the infix *–um-*, the prefixes *i-*, *mag-*, and *mang-;* the suffixes *–in* and *-an*; and the special case of the prefix *ma-* which does the work of two affixes (as will become clear later). (Fig. 3)



The simple Tagalog verb *v* combines a *basic* affix (one of the eight above) and a *simple* verb root

$$v \rightarrow \ | \text{basic affix} + \text{simple root} |$$

As it turns out, whatever affix is in use, all Tagalog verbs conjugate in similar ways, expressed in the following 2×2 permutation: (Fig. 4)

	simple root	repeat 1st syllable
basic affix	Possible	Future
change affix	Past	Present

The Past, Present, and Future constructions are directly generated from the simple form of the Possible in accord with the 2×2 permutation above. (Fig. 5)

	sigaw lagay habol ligo	sisigaw lalagay hahabol liligo
-um- i- ma- må- mag- mang- -in -an	sumigaw ilagay maligo måhabol maglagay manghabol habulin sigawan	sisigaw ilalagay maliligo måhahabol maglalagay manghahabol hahabulin sisigawan
-um- i--in na- nå- nag- nang- -in- -in--an	sumigaw ilinagay naligo nåhabol naglagay nanghabol hinabol sinigawan	sumisigaw ilinalagay naliligo nåhahabol naglalagay nanghahabol hinahabol sinisigawan

Only one, slight deviation from this rule occurs with the *-um-* infix which uses the same form for Past and Possible.[1]

[1]The discrepancy disappears when the minimal, primitive form of the *-um-* VP, i.e., the root alone minus the affix, is used as the basic form, as in *Alis ka diyan!* (Get out of there!), *Kain tayo* (Let's eat), *Tulog na* (Sleep now).

This is the first quadrisection (Q1). It subdivides **V** into exactly four tenses—the Past, Present, Future, and Possible tenses. The first three correspond to the simple tenses of English. We use the Past tense for an action that is already completed, the Present tense if it is currently ongoing, and the Future tense for an action deemed predictable or foreseeable—all at the time of the telling.

Additionally, the permutation enforces a fourth tense, called here the Possible, to which belongs the simple, minimal verb form that is used, in Tagalog as in English, for direct commands and prohibitions—as in *do*, *get*, *go*, do-not-*enter*—or in anticipations and warnings—as in can-*happen*, might-*fall*-in, may-*drop*-by, should-not-*come*, must-not-*think*-of.

Q1 recognizes these simple verbs as tensed verbs, describing neither Past, Present, nor Future actions, but only Possible actions still only theoretical in the mind, imagined doable at some unpredictable, indefinite time. Q1 establishes them in a subset of their own, the tense of Possible actions.

As far as quadrisections go, Q1 is a *perfect* quadrisection, subdividing all verbs in **V** into four distinct, well-defined subsets, by way of a double bisection (a 2×2 permutation of the kind above) of the verb base, such that

(a) no verb belongs to more than one subset—unless it means something different each time,

(b) no verb is left out in the subdivision, and

(c) any new verb introduced into **V** is certain to find a rightful place in one of the four subsets defined by the quadrisection.

It is implied that

(a) verbs that do not conjugate easily into the four tenses of Q1 are disqualified from **V**; they are "incomplete" verbs that are often, if verbs at all, merely special-cases of one of the tenses.

(b) Shorn of incomplete verbs, the four subsets of Q1 are of equal *order*—i.e. they all contain the same number of verbs. In fact, all four contain exactly the same lists of verbs, but each in a different tense.

(c) The English tenses of the copula *be* (am, is, are, was, were, will be) when not followed by another verb, are also disqualified. To the grid they are not true verbs but merely auxiliary particles serving to link subjects and predicates in sentences absent of any observed action .

Q2. Let There Be Four Verbs

Take now any of the quadrants of **V** (we will work on the Possible) and attempt to organize it according to how the affixes divide up the verbs semantically. Soon, two well-defined and overlapping either-or contrasts emerge. A double bisection, similar to Q1's but also very different, surfaces a second quadrisection (Q2) operating in **V**.

In unravelling Q2 below I may use elements and examples from the different tenses, but it is understood that the contrasts described apply equally well to any quadrant of Q1, whatever the tense of the verb.

Let UM be the *affix set* of all verbs in **V** that use the basic affix *–um-*. Similarly define the MAG, MANG, MA, I, IN, and AN affix sets for the basic affixes *mag-*, *mang*, *ma-*, *i-*, *-in*, and *-an*. (Fig. 6)

Possible
UM I MA MÅ MAG MANG IN AN

First bisection. Tagalog grammar traditionally distinguishes these variously-affixed verbs into *doer-focus* and *object-focus* verbs. The prolific *ma-* affix is used for both focuses; we split them up here into two affix sets distinguishing the object-focus as the *må-* affix of the MÅ verbs.

In this first bisection, a differentiation by focus, the Possible verbs (and all their tenses in **V**) are subdivided perfectly into two subsets of four affix sets each. (Fig. 7)

doer focus	UM MA MAG MANG
object focus	I MÅ IN AN

Morphologically, a doer-focus verb is a doer-focus affix attached to a rootword; while an object-focus verb is an object-focus affix attached to a rootword. Semantically, the doer-focus affix turns the rootword into an action of its doer, while the object-focus affix turns the rootword into an action on its object.

A Tagalog verb is always enunciated with a doer noun or object noun in mind. From the root *kain* "eat" comes k*um*ain "someone-ate" and k*in*ain "ate-something". Identifying the doer of a doer-focus verb produces the *minimal* doer-focus sentence of Tagalog (*Kumain siya* He ate); while identifying the object of an object-focus verb produces the minimal object-focus sentence (*Kinain siya* It was eaten).

Second bisection. In a second bisection, the same eight affix sets of Fig. 7 divide up again, but semantically this time, into *volitional* and *non-volitional* actions. Volitional actions are purposeful, self-conscious acts by deliberate doers. Non-volitional actions are spontaneous, unintentional acts of nature. It is the difference between *He rang* and *it rang*, between *I listened* and *I heard*. The bisection cuts across all the eight affix sets—all have verbs on either side of the divide—producing now sixteen distinct and well-defined

affix sets from the original eight affix sets of **V**. To distinguish the non-volitional affix sets we show them now in *italics*. (Fig. 8)

	volitional	non-volitional
doer focus	UM MAG MANG MA	*UM* *MAG* *MANG* *MA*
object focus	I IN AN MÅ	*I* *IN* *AN* *MÅ*

We see how the two bisections together produce a 2×2 permutation (similar to Fig. 4) and our second (perfect) quadrisection (Q2) of the Tagalog verb grid.

Its practical, semantic effect in Tagalog is to reduce all observable, verbable phenomena into four elementary verbs—the I-do, It-happens, do-to-it, and happen-to-it verbs: (Fig. 9)

	volitional	non-volitional
doer focus	I do	It happens
object focus	do to it	happen to it

1) volitional doer-focus → doer-does → I do
2) volitional object-focus → do-to-object → it is done to
3) non-volitional doer-focus → doer-happens → It happens
4) non-volitional object-focus → happen-to-object → it is happened-to

The pronouns are used only as keywords and may appear in the first, second, or third persons, in plural number, or as the nouns they represent. "I" is any person, animal, or thinking entity seen or thought to be the volitional (active, self-conscious, deliberate) doer of the verb. "It" is any person, animal, or entity deemed the non-volitional (natural, autonomic, spontaneous, eventual) doer of the verb; and "it" is the affected (passive, reactive, useful, inevitable) object of the verb.

In the doer-focus, Q2 gives rise in English grammar to the *minimal sentences* of the intransitive verbs—*He ate, It rained*; and in the object focus, to the passive voice of the transitive—*It was eaten, It got wet*.

The combination of the first two quadrisections (Q1Q2) is seen to subdivide **V** into sixteen (4×4) distinct and well-defined subsets representing four elementary verbs in four tenses. (Fig. 10)

PRESENT		FUTURE	
I am doing	It is happening	I will do	It will happen
doing to it	happening to it	will do to it	will happen to it
PAST		POSSIBLE	
I did	It happened	I do	It happens
did to it	happened to it	do to it	happen to it

Notice in Fig. 10 that Fig. 4 has been rotated diagonally, exchanging the Possible and Present positions, which makes no difference to the grid as long as the contents of each subset remains unchanged.

Q3. Let There Be Four Nouns

In Fig. 8 above we see that Q2 leaves exactly four affix sets in every quadrant of Q1. It leads us to conclude that there is a third quadrisection (Q3) that is subdividing all quadrants of Q2 into four, each affix set becoming a distinct subset of the quadrisection: (Fig. 11)

	?	?		
?	UM	MAG	*UM*	*MAG*
?	MA	MANG	*MA*	*MANG*
	I	IN	*I*	*IN*
	MÅ	AN	*MÅ*	*AN*

What 2×2 permutation accounts for this obvious quadrisection is a mystery, at this stage, and the arrangements of the affix sets in the quadrants are for now merely hypothetical.

In any case, according to Q3, the Tagalog language recognizes exactly four kinds of *actions by doers* and four kinds of *actions on objects*, manifesting them as different affixes each time.

It follows that there are fundamentally four kinds of *doers* and four kinds of *objects* that the language naturally recognizes in relation to its verbs. In other words, there are four possible kinds of focus nouns in Q3 for every affix set in Q2.

Without showing us the nouns or verbs, Q3 informs us that there are exactly sixty-four possible kinds of focus nouns in the language, serving to subdivide all verbs in **V** into sixty-four distinct and well-defined subsets representing four possible nouns for each of four elementary verbs in four tenses.

In his *Preliminary Study of Affixes in Tagalog* (Manila: Bureau of Printing., 1937), Cecilio Lopez, doyen of Philippine linguistics, tells of "the almost inexplicable difficulty of distinguishing when to use *-um-* and when *mag-*, the safest way, perhaps, being an appeal to the *Sprachgefuehl*, the speech feeling."

The difficulty cuts across all the affixes, and remains unsolved today. In a way, this entire work is propelled by the desire to resolve this question. By continuing on the path of logical quadrisections that we have started above, the hope is to finally arrive at the sources of these curious variations. In Part 4, after eight quadrisections, I essay a solution to the conundrum based on the results.

Q4. Let There Be Four Sentences

In Q4, in an outburst of language, doer-focus and object focus affix sets pair up in every way, on both sides of the volition line (*i.e.*, volitional and non-volitional verbs do not pair up). In every case, the result is to quadrisect every affix set of Q3 into combinations of doer-focus and object- focus verbs. (Fig. 12)

UM × I	UM × IN	MAG × I	MAG × IN	*UM* × *I*	*UM* × *IN*	*MAG* × *I*	*MAG* × *IN*
UM × MÅ	UM × AN	MAG × MÅ	MAG × AN	*UM* × *MÅ*	*UM* × *AN*	*MAG* × *MÅ*	*MAG* × *AN*
MA × I	MA × IN	MAG × I	MAG × IN	*MA* × *I*	*MA* × *IN*	*MAG* × *I*	*MAG* × *IN*
MA × MÅ	MA × AN	MAG × MÅ	MAG × AN	*MA* × *MÅ*	*MA* × *AN*	*MAG* × *MÅ*	*MAG* × *AN*
I × UM	I × MAG	IN × UM	IN × MAG	*I* × *UM*	*I* × *MAG*	*IN* × *UM*	*IN* × *MAG*
I × MA	I × MANG	IN × MA	IN × MANG	*I* × *MA*	*I* × *MANG*	*IN* × *MA*	*IN* × *MANG*
MÅ × UM	MÅ × MAG	AN × UM	AN × MAG	*MÅ* × *UM*	*MÅ* × *MAG*	*AN* × *UM*	*AN* × *MAG*
MÅ × MA	MÅ × MANG	AN × MA	AN × MANG	*MÅ* × *MA*	*MÅ* × *MANG*	*AN* × *MA*	*AN* × *MANG*

Every one of the sixty-four subsets of Q3 is subdivided again into four kinds of verbs, this time according to the kind of doers and objects that the paired verbs bring together.

Paired verbs are two verbs of the same root but of different focuses, that are naturally thrown together in observation of the same action, each bringing its own noun (or "argument") into the interaction, the doer-focus its doer, the object-focus its object. The pairings give rise to the *simple sentences* of Tagalog.

A simple Tagalog sentence is made up of a verb, a doer noun, and an object noun

$$S \rightarrow V\ dN\ oN$$

The implication in Q4 is that verbs link up different kinds of doers with different kinds of objects; and that different combinations of doer and object produce verbs of different semantic values, and the focus of the verb used in the sentence makes a big difference.

Notice the reverse combinations (in Fig. 12) that appear on either side of the (horizontal) focus-line (*e.g.* UM×IN and IN×UM) . These represent the syntactic transformations that shift Tagalog sentences between doer-focus and object-focus sentences.

Take the combination (*t***um***awid*×*tawid***in**) from the root *tawid* "to cross over". In the UM×IN it produces the generic sentence *tumawid ng tinawid* "who crossed what was crossed". In the reverse IN×UM it produces *tinawid ng tumawid* "what was crossed by who crossed". Thus, *Tumawid siya ng tulay* "crossed he a bridge" (He crossed *a* bridge) and *Tinawid niya ang tulay* "*it was crossed by him the bridge*" (He crossed *the* bridge). In the former, the focus is on the person crossing; in the latter, on the bridge crossed.

We see an extraordinary function for the English articles "a" and "the" in these Tagalog transformations: the shift between indefinite article and definite article before a direct object in an English sentence turns itno a focal shift in Tagalog requiring a whole syntactic transformation .

After four quadrisection (Q1Q2Q3Q4) thus, all verbs in **V** are subdivided into 256 distinct and well-defined subsets, representing four elementary verbs in four tenses, their four possible doers or objects and their pairings into simple sentences, half of the number being focal transformations of the other half.

Q5 to Q8: The Second Four Quadrisections

From Q1 to Q4, we see how linguistic markers and semantic contrasts associated with the affixes of Tagalog verbs combine to reveal an underlying order in the seeming randomness of language.

Language is truly complex but these logical quadrisections given us in Tagalog (especially the first two) are as if an algorithm for its systematic deconstruction. No evidence of these quadrisections survive in the English I speak, but surfaced now in Tagalog they seem clear evidence of an inherent structural order in language, involving simple quadrisections (deductively) and repeating 2×2 permutations (inductively).

The perfect order evinced by the grid after four quadrisections leads one to conjecture that this is an ordering that continues deeper into the language. Why indeed, if these quadrisections signify an inherent process of differentiation, should it stop at four? Might not additional quadrisections lead to an even more detailed but still perfect array of smaller and smaller subsets of **V**, until perhaps we arrive at the deep structure of it all?

The second four quadrisections (Q5 to Q8) advance these possibilities.

There are no easy linguistic markers from here on. We rely entirely on careful and deliberate semantic readings of chosen quadrants, aided by a fair dose of Lopez's *Sprachgefuehl*. As from the start, our method is empirical (we begin with raw data) and distributive (we organize the data into logical subsets); it is, I am told, a structuralist approach rather than Chomskian.

The work involves taking long, hard looks at long lists of Tagalog verbs, seeking out commonalities and patterns there that might be evidence of quadrisections at work, and testing them back and forth between quadrants. In my case, the work has revolved, through the years, around the volitional UM, MAG, I, IN, and AN affix sets of Q3. The results I offer for the IN affix set below combine lessons learned from all these affix sets, all hard-won after many false starts.

The four quadrisections, above and below, are not strictly consecutive, quadrisections being commutative, *i.e.*,

$$QxQy = QyQx.$$

In general, any two quadrisections combined in whatever order will produce the same sixteen subsets (though their allocated places in the grid would change). It is more likely that these quadrisections, in cognition, occur instantly, and it is only language that must string them up in real time in the way each language does. .

What is essential is that the quadrisections taken together, in whatever order we do them, should finally result in the same *grammatical sets*, of verbs of the same semantic intentions that turn into the same kinds of sentences.

The overarching question is: Could the seemingly infinite semantic intentions of our verbs all be reducible to a finite number of grammatical sets, arrayed in a perfect grid by way of progressive quadrisections of just so many layers of meaning? And if so, how many layers are involved, how many quadrisections complete the grid of language?

If my results are correct, the answers are "Yes" and "eight". The affixes generate four layers of meaning, as shown above, and the roots, below, another four layers. Could it be more for some languages? Yes, but it would seem unnecessary.

Q5. Let There Be Four Actions

As we began in Q1: A Tagalog verb is made up of a rootword and an affix.

$$\text{verb} \rightarrow \ | \text{ affix + root } |$$

Four quadrisections later we understand from the affixes that Tagalog verbs naturally conjugate into four tenses, divide up into sixteen affix sets, and combine in pairs to produce sixty-four kinds of simple sentences.

In Q5 we take a closer look at the "root" part of the Tagalog verb, to see if there are possibly four kinds of verbs that these very variable roots become, whatever their affixes happen to be.

Many possibilities present themselves, as may be expected if language is indeed generated from repetitive permutations of contrasting elements. Of all, the most likely candidate for Q5, combining the most pronounced semantic contrasts, looks something like this: (Fig. 13)

	here	there
begin	thing on	thing in
end	thing off	thing out

According to this double bisection, verbal actions either "begin" or "end" things on the one hand, and they either stay in place "here" or involve another place "there". By "things" we mean to encompass all the possible nouns that the verbs might be focused on, whether doers or objects and even verbal nouns.

Actions begin and end, they are bounded in time; actions are here and there, they are bounded in space. Q5 thus combines basic time and space contrasts in a 2×2 permutation to produce the four basic actions of verbs on things. A verb does one of four actions

(1) begin here → action turns thing on
(2) end here → action turns thing off
(3) begin there → action turns thing in
(4) end there → action turns thing out

This is our Q5. In theory, all of **V**, every affix set of Q3, is quadrisectible in this way, each generating its own parallel manifestations of the same semantic foursome.

Because it applies regardless of the affix involved, the quadrisection may be seen to subdivide all root words of Tagalog verbs into four basic root actions—generating the general semantic notions of "turning-on" and "turning-off" and "turning-in" and "turning-out".

Here is the effect of Q5 on the IN affix set in particular: (Fig. 14)

	here	there
begin it	do it	make it
end it	undo it	unmake it

For the IN verbs, the following semantic values are generated:

(1) begin it here → do the object

(2) end it here → undo the object

(3) begin it there → make the object

(4) end it there → unmake the object

In Tagalog all IN verbs are transitive verbs with direct objects, thus the object "it" in the verb phrases above; this "it" is used in its most general sense to stand for all kinds of objects, including even verbals, plurals and "person" objects. The IN verbs point exclusively to direct objects in Tagalog but not vice-versa—most I verbs and some MA and AN verbs also point to direct objects of their own kinds.

The English keywords. The choice of English keywords above—do, undo, make, unmake—and hereafter are meant to put into relief the contrasts I am seeing in the perfected verb lists, but the lines that need to be drawn between some verbs are sometimes very subtle. As we proceed, be warned that these English keywords I offer are mere approximations of espied general, underlying categories. The objective is always to find the English transitive verbs that best capture the defining commonalities, the uniqueness, of the verbs they each overhead. But out of context all these keywords are extremely ambiguous. Of Tagalog rootwords and English keywords the same may be said: that any one may reappear a number of times throughout the grid; but, its semantic value in each case will only be in the sense specific to the quadrisection and quadrant it appears in.

When the precise intention of a keyword is unclear the reader is urged to study its place and its neighbors in the final array of English keywords of the IN grid (Fig. 23) and, if further inclined, to consult the database itself in Part 2 to see there precisely what sorts of verbs, both Tagalog and English, are thrown together and set apart by each quadrisection.

Q6. Let There Be Four Objects

For the sixth quadrisection (Q6) we stay our attentions on the IN verbs where we left off in Q5 (Fig. 14). We focus on these IN verbs because here are to be found the clearest impressions of the semantic variations that will evidence to us three more (!) perfect quadrisections underlying our use of verbs in Tagalog.

Our working advantage in Tagalog are these affixes we are given as linguistic markers that allow us to focus on just a part of the whole language at a time, in smaller and smaller quarters of it, so that what seems to be a formidable semantic problem of infinite scale is reduced to a mere case of patient deconstruction.

The theory, still, is that, whatever quadrisections are found here in the IN affix set, parallel subdivisions must also occur in the fifteen other affix sets of Q3. In Part 4, we do a quick survey of the whole grid from the point of view of the accomplished IN grid.

Q2Q3			
UM	MAG	*UM*	*MAG*
MA	MANG	*MA*	*MANG*
I	**IN**	*I*	*IN*
Å	AN	*MÅ*	*AN*

By definition Tagalog's IN verbs are volitional, object-focus, and use a basic *–in* suffix in their Possible tense.

Take now a large sample of these IN verbs. The IN database I offer in Part 3 has a word-count of 1,550 (more or less) and closely represents my entire vocabulary of IN verbs when conversing in Tagalog. I include only a few loan roots from English as examples although vernacular Tagalog is rife with them, turning foreign words easily into Tagalog verb roots.

Q6. If in Q5 the spatio-temporal frame of verbal actions on objects is seen to subdivide all IN verbs into four basic root actions, in Q6 we find IN verbs divisible again into four according now to what an IN verb makes of the object it is directed at. In keywords, the IN verb either "moves", "changes", "joins", or "chooses" its direct object. The quadrisection seems to arise from a double bisection reminiscent of Q2: (Fig. 15)

	effort	effect
do it	move it	join it
do-to it	change it	choose it

According to this permutation, an IN root action describes either a direct "effort" or an eventual "effect" on an object, which object is either put into action (do it) or put into place (do to it).

The effect is to quadrisect IN verbs, semantically, according to four kinds of direct objects:

(1) effort does it → object as subject (challenging, actionable) → move it

(2) effort does to it → object as material (convertible, malleable) → change it

(3) effect does it → object as person (receptive, reactive) → join it

(4) effect does to it → object as option (useful, available) → choose it

This is our Q6 of IN. As it happens, it applies equally well to the I, AN, and MÅ affix sets. According to it, volitional object-focus verbs distinguish all its objects into 1) actionable subjects, 2) convertible materials, 3) receptive persons, and 4) available options.

Subdivide each quadrant in Q5 (Fig. 14) according to these four it-objects and we get: (Fig. 16)

Q5Q6			
DO IT		MAKE IT	
do subject	do person	make subject	make person
do material	do option	make material	make option
UNDO IT		UNMAKE IT	
undo subject	undo person	unmake subject	unmake person
undo material	undo option	unmake material	unmake option

It is a perfect quadrisection, accounting for all the IN verbs in our lists, in all the listed ambiguities of each. The resulting English keywords for the IN affix set are these: (Fig. 17)

Q5Q6 of IN			
DO IT		MAKE IT	
advance it	address it	further it	engage it
remake it	include it	produce it	assume it
UNDO IT		UNMAKE IT	
counter it	subjéct it	separate it	offend it
disappear it	exclude it	reduce it	preempt it

Thus, for example:

(1) to "do a subject" is to "advance" an object

(2) to "do a material" is to "remake" an object

(3) to "do a person" is to "address" an object

(4) to "do an option" is to "include" an object

On the one hand, the sixteen keywords list the sixteen basic actions of IN verbs on direct objects; on the other, they are a list of the sixteen kinds of objects that we use IN verbs for in Tagalog.

We pause now to introduce some changes in the presentation of our Figures to accommodate more efficiently the upcoming complications of Q7 and Q8, and generally unclutter things.

First, we will use the subscript "o" from hereon to signify the object of a verb (standing for the "it" in earlier Figures) except for the person object which becomes a subscript theta "ɵ". The positioning of these subscripts in the English keywords and later translations is critical, distinguishing, for example, between the semantics of ask-it (ask_o), ask-it-of ($ask_o of$), and ask-of-it ($ask\text{-}of_o$)

Second, we reconfigure Fig. 17 above into the table below. This alternative perspective on Q5Q6 lacks the element of the underlying 2×2 permutations but is otherwise a faithful rendition. (Fig. 18)

Q5Q6 of IN				
	MOVE$_o$	CHANGE$_o$	JOIN$_o$	CHOOSE$_o$
DO$_o$	advance$_o$	remake$_o$	address$_o$	include$_o$
UNDO$_o$	counter$_o$	disappear$_o$	subjéct$_o$	exclude$_o$
MAKE$_o$	further$_o$	produce$_o$	attend$_o$	assume$_o$
UNMAKE$_o$	separate$_o$	reduce$_o$	offend$_o$	preempt$_o$

Arranged in this way, we see that Q5Q6 also tells us, reading down the columns, that there are essentially four kinds each of "moving", "working", "joining" and "choosing" distinguished by IN verbs in relation to their direct objects.

Notice also the contrasting actions of the alternating rows of keywords—"produce" and "reduce", "advance" and "counter", "attend" and "offend", "include" and "exclude", etc.

The table can also be read as a 4×4 permutation of Q5 and Q6 such that, reading down the L-R diagonal for example,

(1) to "do" and "move" it is to "advance" it

(2) to "undo" and "change" it is to "disappear" it

(3) to "make" and "join" it is to "attend" it

(4) to "unmake" and "choose" it is to "preempt" it

More on keywords. The earlier in the quadrisections a keyword is used the more general is the meaning that is intended, encompassing more verbs under it than when it is used in a subsequent quadrisection.

A keyword is not a definition that gathers verbs under it, it is the verbs that are gathered together by the quadrisections and the keyword is selected to point to their unique commonality. The subdivisions are never obvious and the quadrisections are not finally defined by surfaced rules but by the way the verbs finally and categorically divide up when we insist on a semantic quadrisection of them.

Again, a keyword applies only in the very particular sense offered by the range of verbs it overheads and is not be taken at face value. Isolated verbs in any language are naturally polysemous and given the relevant postpositions and arguments the same keyword is wont to re-appear in many other lists throughout the grid.

Some contrasts are easier to appreciate than others. For the more difficult the final recourse, always, is to review the verb lists themselves (Part 2) to verify the true intentions of the subdivisions. Serious experts

might even want to change the keywords then and this would not harm the grid; insofar as the verb lists are unchanged it would be a mere re-naming of sets.

Q7. Let There Be Four Changes

If language is a jungle, then we are into the thick of it now. Q5Q6 gives us sixteen verb lists, each a distinct and well-defined subset of the IN affix set. Each of these lists is still quite lengthy and the semantic values of the verbs within still greatly varied. The persistent question is, is there a semantic quadrisection of one list that is mirrored and surfaceable in all the other fifteen. It is not difficult to subdivide a verb list into some theoretical quadrisection, but accomplishing this on sixteen separate verbs lists using the same theory is.

In Q6, the "work-it" verbs stood out from the start and was a pivot around which the other quadrants formed. In Q7, my pivot has been a batch of verbs discernible in every list that has to do with solutions and expectations, what are gathered under the "try-it" verbs below

In the end Q7 appears to distinguish four different changes that an IN action might effect on any of the sixteen objects of Q6. The emergent English keywords are "show", "serve", "cause", and "try". I conjecture it arises from this 2×2 permutation (Fig. 19)

	here	there
do_o	$show_o$	$cause_o$
$do\ to_o$	$serve_o$	try_o

According to this double bisection the objects of IN verbs are either "here" *at the place* of the action or "there" *in the direction* of the action; and they are also either active *accessories* (do it) in the action or passive *beneficiaries* (do to it) of the action. The following semantic values are generated:

(1) do object here → action is performed on object → show it
(2) do to object here → action is applied on object → serve it
(3) do object there → action is transferred on object → cause it
(4) do to object there → action is planned on object → try it

This is our Q7 of IN. It quadrisects each of the sixteen subsets of Q5Q6 perfectly, generating the sixty-four possible changes that IN roots might effect on IN objects. Here is the result in English keywords: (Fig. 20)

Q5Q6Q7 of IN					
	MOVE$_o$	CHANGE$_o$	JOIN$_ø$	CHOOSE$_ø$	
DO$_o$	ADVANCE$_o$	REMAKE$_o$	ADDRESS$_ø$	INCLUDE$_o$	
	speak$_o$	reproduce$_o$	follow$_ø$	remember$_o$	SHOW$_o$
	declare$_o$	mark$_o$	accord$_ø$	accept$_o$	SERVE$_o$
	activate$_o$	reset$_o$	rouse$_ø$	avail$_o$	CAUSE$_o$
	study$_o$	fix$_o$	ask$_ø$	discover$_o$	TRY$_o$
UNDO$_o$	COUNTER$_o$	DISPOSE$_o$	SUBJÉCT$_ø$	EXCLUDE$_o$	
	nullify$_o$	vanish$_o$	kill$_ø$	disregard$_o$	SHOW$_o$
	disapprove$_o$	expend$_o$	victimize$_ø$	refuse$_o$	SERVE$_o$
	control$_o$	compress$_o$	prevent$_ø$	hinder$_o$	CAUSE$_o$
	remedy$_o$	change$_o$	ease$_ø$	retrieve$_o$	TRY$_o$
MAKE$_o$	FURTHER$_o$	PRODUCE$_o$	ATTEND$_ø$	ASSUME$_o$	
	execute$_o$	assemble$_o$	engage$_ø$	occupy$_o$	SHOW$_o$
	increase$_o$	furnish$_o$	provide$_ø$	keep$_o$	SERVE$_o$
	power$_o$	process$_o$	animate$_ø$	exploit$_o$	CAUSE$_o$
	wish$_o$	create$_o$	call$_ø$	target$_o$	TRY$_o$
UNMAKE$_o$	SEPARATE$_o$	REDUCE$_o$	OFFEND$_ø$	PREEMPT$_o$	
	abandon$_o$	sunder$_o$	assault$_ø$	claim$_o$	SHOW$_o$
	remove$_o$	rid$_o$	expel$_ø$	subtract$_o$	SERVE$_o$
	eject$_o$	fragment$_o$	disturb$_ø$	ingest$_o$	CAUSE$_o$
	segregate$_o$	damage$_o$	trick$_ø$	acquire$_o$	TRY$_o$

As in Fig. 18, one can read each (yellow) quadrant above as a 4×4 permutation, this time of Q6 and Q7. In the MAKE quadrant above, for example (L-R diagonal),

1) to "further" and "show" it is to "execute" it
2) to "produce" and "serve" it is to "furnish" it
3) to "attend" and "cause" it is to "animate" it
4) to "assume" and "try" is it to "target" it

Some of the resulting contrasts are unexpected, but ultimately reasonable. The most curious are those between the "try-it" verbs in the DO-UNDO and the MAKE-UNMAKE quadrants. But they are located where they are by the grid without appeal; the grid runs a very tight ship. One might naturally expect a "fix-it" to be contrasted with a "damage-it"; instead it is opposed to a "change-it" (while "damage-it" is opposed

to a "create-it"). Often with the grid, our instincts are overtaken by the hard evidence of the accumulated data.

Q8. Let There Be Four Ways

In an eighth quadrisection, the sixty-four IN subsets of Q5Q6Q7 subdivide just once more to become, finally, what appear to be the 256 grammatical sets of the IN verbs of Tagalog.

According to Q8, each of the sixty-four possible changes on IN objects by IN root actions (Fig 20) can be effected in four different ways with a different result each time. For example, we can "reproduce" an object in four ways: we can "replicate" it, "record" it, "copy" it, or "render" it. The subdivision might be imagined to arise from this double-bisection: (Fig. 21)

	effort	effect
$begin_o$	proceed to do_o	intend to do_o
end_o	decide to do_o	propose to do_o

The 2×2 permutation gives rise to the following semantic quadrisection:

1) effort begins it → do it thoroughly, devote an activity → proceed to do it
2) effort ends it → do it skillfully, direct an action → decide to do it
3) effect begins it → do it purposely, accomplish a project → intend to do it
4) effect ends it → do it hopefully, attempt an objective → propose to do it

This is our Q8 of IN. It subdivides each of the sixty-four verb lists of Q5Q6Q7, each into four logical subsets, according to four different ways that any of the sixty-four changes generated by Q7 might be effected on an object.

For example, its effect on the "show-it" verbs of the DO quadrant of Fig. 20 are these sixteen grammatical sets of IN verbs: (Fig. 22)

DO$_o$	REVEAL$_o$	REMAKE$_o$	ADDRESS$_ø$	ABSORB$_o$	
	SPEAK$_o$	REPRODUCE$_o$	FOLLOW$_ø$	REMEMBER$_o$	SHOW$_o$
	reveal$_o$	record$_o$	answer$_ø$	learn$_o$	PROCEED TO-
	voice$_o$	replicate$_o$	acknowledge$_ø$	recall$_o$	DECIDE TO-
	mention$_o$	copy$_o$	obey$_ø$	adopt$_o$	INTEND TO-
	translate$_o$	render$_o$	imitate$_ø$	perform$_o$	PROPOSE TO-

Reading down the first column, we see how the permutation generates the four different ways to "speak" (on) a subject object:

1) to "proceed to speak it" is to "reveal" it
2) to "decide to speak it" is to "voice it"
3) to "intend to speak it" is to "mention it"
4) to "propose to speak" is to "translate it"

All told, four quadrisections combined (Q5Q6Q7Q8) now subdivide the IN affix set, of volitional object-focus verbs that use the *–in* affix, into 256 distinct and well-defined grammatical sets, organized in a perfect grid in the order manifested by the English keywords below.

To view it all in a single frame, let us reconfigure Fig 20 again—

a) Forego the subscripts "$_o$" and "$_ø$" but understand them to be implicit after every English keyword as direct objects of the transitive verbs.

b) Exclude the operator keywords (top row and right column), their roles now accomplished.

c) Bring the DO-UNDO and MAKE-UNMAKE halves back together side by side as in Q5 (see Fig. 15). The result is this: (Fig. 23).

Q5Q6Q7Q8 OF IN							
DO				MAKE			
SPEAK	REPRODUCE	FOLLOW	REMEMBER	EXECUTE	ASSEMBLE	ENGAGE	OCCUPY
reveal	record	answer	learn	fulfill	combine	conjoin	enter
voice	replicate	acknowledge	recall	enact	interlock	meet	hold
mention	copy	obey	adopt	accomplish	arrange	visit	explore
translate	render	imitate	perform	persevere	construct	patronize	cross
DECLARE	MARK	ACCORD	ACCEPT	INCREASE	FURNISH	PROVIDE	KEEP
praise	label	compliment	like	improve	layer	foster	carry
proclaim	pinpoint	favor	fancy	extend	enlarge	gift	lift
assure	okay	grant	endure	complete	fill	feed	lead
clarify	answer.up	inform	incur	maximize	soak	train	rescue
ACTIVATE	RESET	ROUSE	AVAIL	POWER	PROCESS	ANIMATE	EXPLOIT
play	form	deploy	try	operate	prepare	amuse	trade
handle	shift	prompt	use	start	mix	amaze	invest
propel	shape	compel	savor	trigger	cook	tease	develop
force	tauten	urge	absorb	ignite	treat	induce	culture
STUDY	FIX	ASK	DISCOVER	WISH	CREATE	CALL	TARGET
examine	repair	interview	research	request	invent	invite	find
appraise	even	dun	look	demand	collect	summon	catch
measure	solve	consult	determine	aspire	plan	entice	shoot
analyze	correct	interrogate	draw	await	cause	woo	capture
UNDO				UNMAKE			
NULLIFY	VANISH	KILL	DISREGARD	ABANDON	SUNDER	ASSAULT	CLAIM
retract	erase	slaughter	forget	abort	dismantle	molest	seize
omit	dele	execute	dishonor	cancel	unbind	hit	get
void	burn	murder	disobey	conclude	jumble	punish	snatch
withhold	annihilate	exterminate	ignore	leave	demolish	attack	steal
DISAPPROVE	EXPEND	VICTIMIZE	REFUSE	REMOVE	RID	EXPEL	SUBTRACT
criticize	spend	oppress	boycott	dispose	clean	dismiss	partake
mock	overuse	humble	snub	detach	trim	eliminate	deduct
oppose	exhaust	deprive	deny	excise	empty	oust	harvest
assail	waste	cheat	disappoint	exclude	smooth	banish	profit
CONTROL	COMPRESS	PREVENT	HINDER	EJECT	FRAGMENT	DISTURB	INGEST
limit	distort	halt	block	exude	mill	alarm	drink
shut	crumple	fend	restrain	release	divide	confuse	swallow
constrict	compact	reproach	restrict	impel	till	annoy	eat
stanch	tighten	dissuade	arrest	dislodge	dissolve	torment	chew
REMEDY	CHANGE	EASE	RETRIEVE	SEGREGATE	DAMAGE	TRICK	ACQUIRE
dress	reverse	calm	fetch	shell	pierce	stupefy	buy
secure	exchange	comfort	pick	winnow	tear	blind	redeem
relieve	vary	console	gather	filter	shatter	deceive	contract
cure	alter	doctor	withdraw	sort	ruin	outwit	earn

Each of the 256 subsets of IN verbs above represented by its English keyword is a distinct and well defined set of IN verbs that have similar semantic intentions and turn into similar sentences in Tagalog, what I call "grammatical sets."

The verbs of an IN grammatical set

a) are constructed alike, they have the same affix, undergo the same inflexions, and transform into the same derivative words;

b) may replace each other in sentences, expressing alternative ways of producing a similar change on a similar object; they are not the same verbs, but are synonymous in the sense that their keyword suggests; theoretically, the keyword may replace any of them in a sentence;

c) represent only minimal sentences in Tagalog (*It is said, I was cheated*) and must each combine with a doer-focus grammatical set (see Q4) to generate the simple sentences of Tagalog (*I said it, he cheated me*).

Here below is the progress of the "reproduce" verbs of Q7 into its grammatical sets in Q8 (top row, column 2) This is a relatively short list for Q7 subsets and offers a quick lesson on the final shaping of grammatical sets. (Fig. 24)

Q7
REPRODUCE$_o$
copia, *copy*$_o$
drawing, *draw*$_o$
gaya, *copy*$_o$
guhit, *draw*$_o$
hulmá, *cast*$_o$
limbag, *publish*$_o$
maquinilla, *type*$_o$
molde, *mould*$_o$
pinta, *paint*$_o$
record, *record*$_o$
sketch, *sketch*$_o$
tape, *tape*$_o$
trace, *trace*$_o$
type, *type*$_o$
p-tatak, *make*$_o$*imprint*

→

Q8
REPRODUCE$_o$
RECORD$_o$ record, *record*$_o$ tape, *tape*$_o$ **type**, *type*$_o$down **maquinilla**, *type*$_o$down
REPLICATE$_o$ hulmá, *cast*$_o$ limbag, *publish*$_o$ molde, *mould*$_o$ p-tatak, *make*$_o$*imprint*
COPY$_o$ gaya, *copy*$_o$ copia, *copy*$_o$ **type**, *type*$_o$up **maquinilla**, *type*$_o$up trace, *trace*$_o$
RENDER$_o$ guhit, *draw*$_o$ pinta, *paint*$_o$ drawing, *draw*$_o$ sketch, *sketch*$_o$

The following notes apply above and throughout the IN tables in Part 2.

a) Only the roots of the IN verbs are listed but each must be read with its *-in* suffix to match the English translation given. The *-in* usually turns into a *-hin* when the root ends with an unstopped vowel (e.g. *basahin* read it, *luksohin* leap it) and very rarely into a *–nin* (e.g. *kuhanin* get it).

b) I follow no strict rules in the spelling of the root words. All the English and many of the Spanish loan words are listed in their original spellings unmarked.

c) Read the subscript ₒ in the translations as the direct object "it" to better capture the semantic feel (the *Sprachgefuehl*) of the IN verb. Elsewhere read the subscript ₒ as a "him" or "her".

d) Some roots of IN verbs like "patatakin" come with prefixes of their own; besides *pa-* other prefixes to be encountered are *ma-*, *ka-*, *pang-*, and two kinds of *pag-*. They are found throughout the IN grid and are indexed separately in Part 3.

Notice how "type-in" (*Eng*. + *-in*) and "maquinillahin" (*Sp*. typewriter + *-in*), synonyms in Q7, are located twice by Q8 in two separate grammatical sets—to signify the *recording* of incoming data, on the one hand, and the *copying* of extant material on the other; it is the difference in English between "type it down" and "type it up". We see the important role that postpositions play in separating English verbs into their grammatical sets.

These differentiations happen throughout Q8. Here in REPRODUCE "gayahin" *copies material* but elsewhere in the grid it *imitates a person*. An extreme example in the IN verbs is "tapikín" from the root "tapík", describing a "tapping" or patting" motion of the hand . It is very useful in Tagalog appearing in 10 grammatical sets. (See index, Part 3)

What grammatical sets eventually form are unexpected and unpredictable, defined entirely by the semantic range of the verbs of a list. Adding more verbs to a list (say, from another language) can change the boundaries of these grammatical sets and call for a revision of keywords. The grid is quite fluid in this matter.

My own estimation is that the 256 IN grammatical sets of Fig. 23 are 95% locked in. The 64 foursomes of Q8 are not arrived at independent of each other but are required by the grid to all subdivide along similar lines, the lines finally defined by the four operator keywords of Q8 in Fig. 21. Each foursome of grammatical sets, in the order it appears, is in effect locked in by the order of the 63 other foursomes.

That this has even proven doable ultimately validates the past seven quadrisections and this present final array as a dependable representation of a true grid underlying language. What else to make of the fact that Tagalog verbs can be quadrisected repeatedly this way and finally produce these grammatical sets out of nowhere? Eight sets of four English keywords accomplish it, the final four leaving no IN verb unturned.

After eight quadrisections it is as if a square piece of paper has been folded-into-four eight times, producing the outlines of 4^8=65,536 small squares, each square representing a grammatical set of the Tagalog language.

If there is an order in language, I offer that this grid must be close to the truth of it.

(*To be continued*)