

PROCESS THOUGHT

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**Handbook
of Whiteheadian Process Thought**

Volume 2



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Handbook of Whiteheadian Process Thought

Thematic Entries II *Biographical Entries* *Critical Apparatus*

⁸ Whitehead calls this purpose the "initial subjective aim."

⁹ Other actual entities can also create that comparison, even if the concrescence in question does not. Whitehead argues that God includes (prehends) all aspects of each actual entity in the world, without any omissions or exclusions, and thus the world as included in what Whitehead calls the "consequent nature" of God becomes the "standard" of truth. Presumably God makes every possible comparison and thus knows every truth in the world.

¹⁰ Whitehead distinguishes between the truth of a proposition and a judgment about its truth. We may say that he has a correspondence theory of truth, but a coherence theory of judgment. Our focus in this essay, however, is on truth and falsity as such and not on judgments about that truth or falsity.

¹¹ A detailed and technical survey of the claims in this essay, along with full documentation, may be found in Franklin, 1991.

Whiteheadian and Functional Linguistics

David G. Butt

The world of linguistic theorizing is typically divided into two hemispheres—one which regards itself first of all as "functional," and one which describes itself as "formal." At the center of the functionalist (and pragmatist) tradition is a school which is explicitly Whiteheadian in its guiding principles, although few of the leading proponents of that tradition have been aware of the Whiteheadian connections. This Whiteheadian school of linguistics comes out of the leadership provided by J. R. Firth (1890-1960), the first Chair of General Linguistics in Great Britain and professor of the School of Oriental and African Studies in London. Firth himself was explicitly Whiteheadian in his approach to symbolic experience. He made many direct references to Whitehead, and a number of his crucial ideas were expressed in an idiom which echoed Whitehead's formulations on epistemology and science: for instance, Firth emphasized language as "pattern" and "process," and the importance of the linguist not engaging in ontological debates about language as a "thing" or about the "existence" of linguistic tools—which are themselves just a "scaffolding" for "language events" (Firth, 1968, 24; 1957, 190-192). Clinically, and often acerbically, he highlighted the anomalies generated by linguistic methods which reified units or hypostatized the "system" of language. He dismissed the relevance of bifurcations like mind/ body, form/ content, subjective/ objective, word/ idea (Firth 1957, 192; 1968, 90).

Functional linguists work to clarify the relational matrix which underpins semiotic values. And it is in sciences of value—specifically in the description of relations of meaning—that Whitehead's work can provide an immediate renewal of engagement for researchers working for practical outcomes in their enquiries. My claims here do not depend on linguists and other scientists becoming explicitly and self-consciously Whiteheadian in their views. What I am suggesting is that functional linguistics needs to develop along the lines of a science which was adumbrated by Whitehead and which is implicit in the critiques he turned on the scientific assumptions of his time, in particular concerning substance and causation. For functional linguists, Whiteheadian ideas are not so much a metaphysical option as a practical necessity of more realistic accounts of human interactions.

The critical affinities between the perspectives of Whitehead and of Firth were across a wide front of issues concerning process and its representation. But it is also worth emphasizing their common attitude towards the creativity inherent in each moment of experience—that point of convergence between the patterns of past, one's history as an organism, and the potential of a future in which novelty depended on the elaboration of established patterns. In Firth's work, one is confronted by the extent and depth of social regularities; but equally, one is never permitted to forget the concrete embodiment of language in phonetic behavior (Firth, 1957 [1948], 143).

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Echoing the analogy of plane flight used by Whitehead, Firth too emphasized a return to the ground of concrete data, after the rigorous application of rarefied theory:

Renewal of connection with the processes and patterns of life in the instances of experience is the final justification of abstract linguistics (Firth 1968, 24).

Firth's direct and implicit uses of Whitehead are pervasive in his two volumes of papers, with titles like "Modes of meaning" being direct allusions (*cf. Modes of Thought*, Whitehead (1938)). Others who have followed Firth in his social orientation to linguistics—in particular, Firth's student M. A. K. Halliday and the many scholars who have worked closely with Halliday's developing theory—have contributed to a drift towards Whiteheadian thinking, even when the connection with Whitehead has not been an explicit or conscious research goal. Those who consciously drew from the work of both Firth and Halliday, and who saw clearly the connection between Firthian linguistics and Whitehead also deserve a full treatment. Here I will just mention Margaret Masterman (1910–1986), who led the Cambridge Language Research Unit, and who tried to integrate the views from the work of all three scholars. According to Yorick Wilks, Masterman was "ahead of her time by some twenty years" in "language processing by computers" (Masterman 2005, Introduction, 1).

This situation is sketched out below, drawing only on perspectives from one stratum of the complex organization of language. In this discussion, I illustrate what might be regarded as Whiteheadian, process-oriented techniques as they developed in phonology—i.e. in the description of the ways in which sound is organized in the realization of human languages. As emphasized at various points in my survey, phonology is only one of four or five interrelated levels of intricacy in languages. Other levels, like grammar and semantics, multiply the problems and intensify the need for process thinking. In the bandwidth of the present discussion, the ideas of Whitehead which will most resonate with the linguistic issues include: "the fallacy of misplaced concreteness;" "occasions of experience;" "causal efficacy/presentational immediacy;" and, more obliquely, "internal and external relations" and "negative prehensions."

1. The "Fallacy of Misplaced Concreteness"

The most straightforward demonstration of the relevance of Whitehead's work for functional linguistics comes from reflecting on segmentation, and the discreteness of segments in a linguistic account of speech. The flow of speech is a paradoxical stream of relations between at least four simultaneous levels of organization. At one level, we can recognize the fuzzy, phasal "units" of our culture—this unfolding of interlocking behaviors is a *wedding*; that ensemble constitutes a *funeral*; these are the moves in *buying and selling* something *expensive*, and these contribute to transactions of another kind. This level of "context" encompasses pragmatics and the social networks of an actual speaking community—an enormous undertaking, but one which can be addressed, like other forms of complexity, by regionalizing and finding parameters which have semantic consequences for the direction of the social processes at stake in the given research.

To express (or "realize") these fuzzy units of cultural convention, one needs the resources of *stating, enquiring, commanding, and convincing*—namely one draws on the great legacy of "tropes" discussed in traditional rhetoric. This second level we could call our "semantics." We cannot do without this level and go straight to the words and grammar because there are many strategies for making a *case*, an *argument*, or even an *offer*. This is to say there is a many-to-many relationship across the levels of semantics and of lexis and grammar (hereafter "lexicogrammar"). These levels are different kinds of abstract patterning, requiring quite distinct forms of descriptive techniques. The words and grammar of a language can be recruited to all kinds of semantic purpose, just as a diverse range of meanings might be brought to the "articulation" of a given context of situation, with each dimension of meaning attuned parametrically to the specific demands of the social relations. Equally, we must say that each strand of meaning creates the context with an appreciably different semantic "spin" or "structure."

The level of lexicogrammar manifests the "forms" which are the realization of meanings; but these are recorded into patterns of sounds (i.e. realized according to the sound patterns of the given language) and instantiated as actual sounds, i.e. phonetically. But the acoustic reality of what we call speech is a function of all these levels happening together—their co-dependency is *NOT* causal, but *realizational*.

Therefore, to say language is a meaning coded as a sound is utterly misleading. A number of codings have to take place altogether (not serially) for the locution to happen; and such codings (and therefore the locution) carry the implication of speakers and hearers who are themselves a bundle of relationships with respect to a speech community. In this speech community, a whole history of cross-calibrated behaviors has had to develop. We have to think of this development as a process of semantic evolution in which the complex currents of the present are functionally motivated elaborations of more narrowly restricted contexts. This is to say that we infer such semantic diversification over the 1.9 million years since the initial semiotic endeavors of *Homo habilis* (Leakey 1995, 163ff).

The "organic," layered, interdependent character of this development is not easily described. Something of the difficulty of description can be seen in trying to track language development in children; but the latter process receives its vector character, its teleonomic dynamism, from the semantic pressure exerted constantly on a child. There is a world of language-users who get things done through employing this intricate "realizational system": layers of interdependent values. Of course, in early Hominid behaviour every extension of such values, and their interrelations, would be an innovation in "mind" (Noble, 1996). And the fact that such elaboration is constantly in progress ensures that any synchronic, idealized snapshot of the system can only be a fiction, not just a *reification* of the system as such, but a *hypostasis*—a freezing out of exactly those characteristics of flow and variation which most define the phenomenon and which both Whitehead and Firth most demanded of representations.

A further level of "thingifying"—fallacious concretization—might be put on notice here, albeit just to direct readers to a fuller exposition (Halliday, 1998; Butt, 1985/1989; Halliday, 1993). As the tempo of semantic evolution has been raised by the diversity of forms of work, by the interlacing of communities, and by tools for exchanging symbols, the texts of English have

shifted towards nominal structures in their grammatical regularities. In particular, the technological preoccupations of talk and of writing have produced an intensification of the pattern "x is/ becomes/ means/ equals/ has y." Such a pattern facilitates the expression of equivalence between entities, the coding of attributes and of quantities, and the nesting of embedded structures (e.g. where a process appears in a defining relative clause that qualifies a head noun as the x or y term in the verbal equation: "That *is* the one that I want" rather than "I *want* that one"). The empire of the noun has been on the rise—and relentlessly. Our construals of experience—from scientific enquiry to sport and human relations—are being uttered as growing aggregations of fallacious entities!

There are two problems on the work bench, then: the segmentation of language by the analyzing linguist; and the segmentation of experience by the forms which speakers project onto their experience by using the grammatical resources to hand. Such formulations of experience take on the force of a semantic tide, a "drift" (Sapir, 1970 [1921], 154-55). The latter constitutes a "fashion of speaking" which, in 'standard average European' languages (Whorf, 1956: 138), has become a covert tendency towards greater and greater reliance on nominalizing (see Whitehead's many condemnations of the related subject-predicate formulations of experience, 1978 [1927], eg. xiii, 7, 13, 30, 159 *et al.*).

However we might protest about the need for "process thought," we must attend to the fact that the grammar in which we protest may be itself at cross purpose to our metaphysical goals. Whitehead's "magnum opus" (1978 [1928]) is an extreme case of the grammar of axiom and definition (virtually a semantics of "frozen sections") pulling against its own declared aims: process. By contrast, the poet Wallace Stevens can create the linguistic texture of a Whiteheadian reality—its evanescence, its relational felicities, its creativity over and above causality—without defining the terms of that reality philosophically (Butt, 1988; Melrose, 1996, 120-39).

But let us return to the linguist's difficulties with the segmentation of language as "object." The difficulties are in many respects like the difficulties confronting other life sciences, and biology in general. If we take an extended quotation from Lewontin, Rose and Kamin (a quotation cited also by the biologist Charles Birch in offering background to his ecological thinking in Birch 1990, 46), the isomorphism is remarkable:

A living organism—a human, say—is an assemblage of subatomic particles, an assemblage of atoms, an assemblage of molecules, an assemblage of tissues and organs. But it is not first a set of atoms, then molecules, then cells; it is all of these at the same time. This is what is meant by saying that the atoms, etc., are not ontologically prior to the larger wholes that they compose. Conventional scientific languages are quite successful when they are confined to descriptions and theories entirely within levels. It is relatively easy to describe the properties of atoms in the language of physics, of molecules in the language of chemistry, of cells in the language of biology. What is not so easy is to provide the translation rules for moving from one language to another. This is because as one moves up a level the properties of each larger whole are given not merely by the units of which it is composed but of the organizing relations between them. To state the molecular composition of a cell does not even begin to define or predict the properties of the cell unless the spatiotemporal distribution of those molecules, and the intramolecular forces that are generated between them, can also be specified. But

these organizing relationships mean that properties of matter relevant at one level are just inapplicable at other levels. Genes cannot be selfish or angry or spiteful or homosexual, as these are attributes of wholes more complex than genes: human organisms (Lewontin, Rose & Kamin 1984, 278).

Here we see the "levels" of a realizational system—all parts assume the whole rather than the whole being explicable as an aggregation of the parts. On each level the functions performed are of an order removed from the levels of "performance" above or below (if one can artificially think of single patterns for the purpose of talk).

Now, let us turn to "discreteness" and segmentation in language, specifically at the level of phonology. Linguists routinely achieve useful descriptions of unwritten languages by conceiving of the chain of speech as a succession of elements which can carry a contrast for speakers of the given language. If one finds two words which are semantically differentiated by one element alone (such as /pill/ and /bill/) then such a "minimal pair" provides a basis for the contrastive sounds to enter the inventory of phonemes for that language. By extracting such contrasts from a data set, there is empirical support (which is replicable) for a phonological interpretation of the speakers who provided the data. A phonemic analysis delivers the generalized, idealized version of the segments of words in speech. This abstraction is derived from a more realistic rendering of the flow of speech—the phonetic transcription. In the latter, the acoustic reality is of a higher order because the rendering is more faithful to the articulatory details of the individual segments.

But the successive segments remain, only enhanced by diacritics and by noting the allophonic variation: i.e. the changes that a particular segment undergoes because of its contingent neighbors. So, two different sounds can be taken as versions of the "same" phoneme (i.e. they are allophones) if it can be argued that the sounds are only different because the specific segments around each have affected their articulatory instantiations. Equally, we could say the two sounds cannot occur in the "same" phonetic environment, and thus cannot be contrastive as a "minimal pair". They cannot contrast if they are the same form in two contexts.

It is worth noting three points about this traditional phonemic approach to phonology. First, it depends on information from other levels, from the meanings (semantics) and wordings (the lexicogrammar)—one cannot seal off or isolate linguistic techniques from each other. Second, there is a great potential for creeping Platonism when the actual sound/ articulation is set aside for an underlying ideal, atomic component. Third, the unit "phoneme" creates a considerable problem of junctures and boundary conditions which are difficult to substantiate either perceptually (by human judgments) or acoustically (by instrumental analysis of consonant and vowel "clusters").

One attitude we might adopt towards this conventional picture is that it is a "good enough" method for many purposes, even for some specialist activities like the evaluation of writing systems. Bernard Shaw (and many others) might chafe at inconsistencies between sounds and spelling, between what we 'sound' and what we 'write', but most non-specialists accept the trade off between a rough fit and the result—a standardization of writing across the global community of speakers (particularly useful in the case of English).

Firth's position was both more accurate theoretically and more practical than the conventional techniques of the 1940s and 1950s. In linguistics, and perhaps in many sciences, one must "eat

the cake and have it too": by demanding more of theory, practical matters become more tractable. I have taken this figure of speech from Firth's student, M. A. K. Halliday, as well as from the spirit of pragmatism:

although practical men generally prefer to leave their major premises inarticulate, yet even for practical purposes theory generally turns out the most important thing in the end (Oliver Wendell Holmes 1899, 420)

Firth's own views were pragmatist—he did not regard linguistics as an enquiry into incontrovertible truths "out there." Rather, linguistics was for him a "scaffolding" by which linguists could make useful statements about authentic texts. The scaffolding needed to be set aside after the statements have been arrived at. The framework was not to become the thing in itself of the investigators.

2. Process over Substance in the Stream of Speech

Firth's techniques with respect to the sounds of a language can be characterized as process-oriented: they were a proposal to capture the actual flow of sound resulting from the flow of articulatory performance. First of all, he highlighted what segmental, discrete representations omitted, namely, the ongoing influence of articulations across a spread of possible units. The influence and the spread were addressed in the term "prosody." Such prosodies included necessary extensions of the conventional phoneme and syllable, as well as the problems raised by intrusive sounds, namely, those that link units of articulation at the boundaries of standard units (like words). The process character of speech needed to be represented, then, for the sake of the extended nature of articulatory effects and for the reason that putative segments were in fact carried over through "junction prosody" (Tench 1992, 2). This is to say that they were not discrete units of sound although they may be "heard" as discrete words and meanings (from the point of view of other linguistic levels like the lexicogrammar).

A second point of contestation is more general, and represents a rejection of what was implied by the standard techniques of phonology. Firth's alternatives to any "monophysite doctrine" (Firth, 1957 [1948], 123) were a clear anticipation of what today we would classify under complexity theory and its techniques for managing non-linear dynamics:

The time has come to try fresh hypotheses of a polysystemic character. The suggested approach will not make phonological problems appear easier or oversimplify them. It may make the highly complex patterns of language clearer both in descriptive and historical linguistics. The phonological structure of the sentence and the words which comprise it are to be expressed as a plurality of systems of interrelated phonematic and prosodic categories. Such systems and categories are not necessarily linear and certainly cannot bear direct relations to successive fractions or segments of the time-track of instances of speech. By their very nature they are abstractions from such time-track items. Their order and interrelations are not chronological (Firth 1948, 151, cited in Tench 1992, 2).

This kind of thinking opened the way for a number of related developments in phonetics, including a parametric framework which was developed by the leading phonetician of the

twentieth century, David Abercrombie (see Abercrombie 1965). In this, as set out by Tench (1992, 4), the activity and non-activity of many physiological variables of speech production could be displayed, including their degrees of engagement in the actual speech process.

Overall then we can say that the *prosodic* approach encompassed problems that had fallen off the linguist's work bench: some phenomena which had been treated as if of no significance for speakers; or others which were clearly recognized in the world's languages, but which were relegated to the status of an oddity or exception. One such typological issue, illustrating the importance of Firth's way of seeing co-existing processes in all speech, was vowel harmony in Turkish and Hungarian. Of particular interest in vowel harmony is the way one vowel determines the form of a following, non-contiguous vowel. But this determination in the flow of sound has a number of more complex strands—one cannot focus on the vowel change as an issue of swapping one segment which we might have expected for another which was actually articulated. The word under examination can have certain prosodic effects which extend over the articulation of the whole word. Other influences may be specific to the first syllable only. And, as is always the case, each consonant introduces its own dynamics of plosiveness, nasality and so on.

The "piece" under analysis is always a convergence of numerous extended events, each of which has a dynamic character that varies with the variability of the "phonematic" structures, that is, across any of about seven domains of possible relevance—consonant and vowel, word and word part, syllable and syllable part, as well as sentence and sentence part.

In the Systemic Functional Linguistic theory of Firth's student, M. A. K. Halliday, one can see all these convergent complexities take on an explicit role in the phonological method. One has a hierarchy (or rank scale) of units that appears straightforward enough: phoneme, syllable, foot, tone group. But this is not a phonemic system as such—the smallest unit of phonological contrast can be different from language to language and *will need to be ascertained specifically for each language* (Firth 1957 [1948], 122). So too, phenomena that are manifested at one rank in one linguistic system may be consequential at a different rank in another language.

In Halliday's "A systemic interpretation of Peking syllable finals," one can follow a detailed application of the Firthian approach through non-segmental features (Halliday 1992, 98). Halliday notes the compatibility of Firth's theory with traditional Chinese phonology as interpreted by Halliday's own teacher in China, Wáng Lǐ (Wáng, 1936). The detailed exposition of Halliday's article cannot be summarized here. But two extracts (one here, and one in the section on "occasions of experience," below) serve well our concerns with Whitehead's programs for science (and metaphysics). When the reader considers the linguistic issues raised in the extracts, the direct relevance of Whitehead's ideas to the work practices of functional linguistics takes on a more concrete form. For in linguistics, I am claiming, Whitehead's universe is *not* a metaphysical program, but an operational necessity. This necessity is spelt out in the following paragraph as Halliday looks back over the early moves of his paper and contrasts the prosodic (extended process) method with the segmental:

We can now see the difference in what is implied by a prosodic and a segmental interpretation. Consider the syllable *zhan*, in contrast (i) with *zhai* and (ii) with *zhang*. The pair *zhan/zhai* may have identical vowel quality, differing only in that one is nasal, the other oral. On the other hand, *zhan/zhang* may have identical

nasal resonance (no tongue contact, hence no segmental realization of alveolar/velar), differing only in that one has a fronted vowel, the other a backed vowel. Likewise, *zhao/ zhang* have the same posture with different resonance; *zhao/ zhai* the same resonance with different posture. It is difficult to explain this in segmental terms, with a segment /a/ followed by the four distinct segments /i/, /o/, /n/, /ng/. But it becomes predictable if we explain these four as the product of two intersecting two-term prosodic systems: posture (y-prosody or w-prosody) and resonance (nasal or oral) (Halliday 1992, 104).

The prosodic techniques required a representation which was adequate to the process reality demanded of the theory. Phonetic symbols can be enhanced by diacritics to convey all kinds of specific modifications of a segment, or what one might regard as variation resulting from the specifics of its environment and its contribution to systemic contrast. But, like all alphabets, the implication of the symbols is that a string of discrete elements is produced and processed as "successive fractions" (Firth 1957 [1948], 137). While not denying that linearity is a fundamental concept in linguistics (since both written and spoken texts unfold in time), it should be clear from the foregoing that the linearity is that of a multidimensional behavior, and that such multidimensionality applies on each of the four levels of language as well as in a realizational relationship across all these levels (i.e. phonology, lexicogrammar, semantics and context). An enormous number of pieces in the game are "in motion." In fact, what we are trying to do is manage the ensemble effects across continuous motion or variability. For if the parameters of sound, of grammar, and of rhetorical (semantic) strategies could be thought of, heuristically, as constant, the social parameters of the context would still be creating new "values" in the totality of linguistic relations.

3. System Networks and the Relational Matrix of Language

An elegant resolution to the problem of modeling relational complexity is the system network, presented by Halliday in 1964 (Halliday, 1969) and later also adopted by the stratificational, cognitive linguist Sydney Lamb (Lamb, 1970). The system network is a diagram of simultaneous relations: by combining notation for five basic relations ("or," "and," "only if *X* then *Y*," "all of *X* lead to *Y*," and "re-enter to choose over"), Halliday could represent the numerous complex dependencies on each level of language patterns.

These simple terms create a picture of relations that is counter-intuitive in its coverage of complexity: one might doubt that five relational operators could encompass the labyrinths of language and the "looms" of neurons (which are the additional target of Lamb's Stratificational Linguistics; see Lamb 1999).

The explanation arrives after only a little reflection. First of all, language does not have to be imagined through the metaphor of "rules," with vast qualifications and anomalies. Halliday's guiding metaphor is "choice," even creative "option"—what are the alternatives available to the speaker? This is addressing the paradigmatic axis of linguistic organization (see de Saussure 1974 [1915], 125-127). Next, we need to clarify the environment in which the choice arises.

Since language is polysystemic, the environment is set by an ENTRY condition—to enter a specific system one has to set out from the relevant structure. For example, one might set out from a set of alternatives which applies to a major clause (in the grammar), or to a tone group (in the phonological system) and so on.

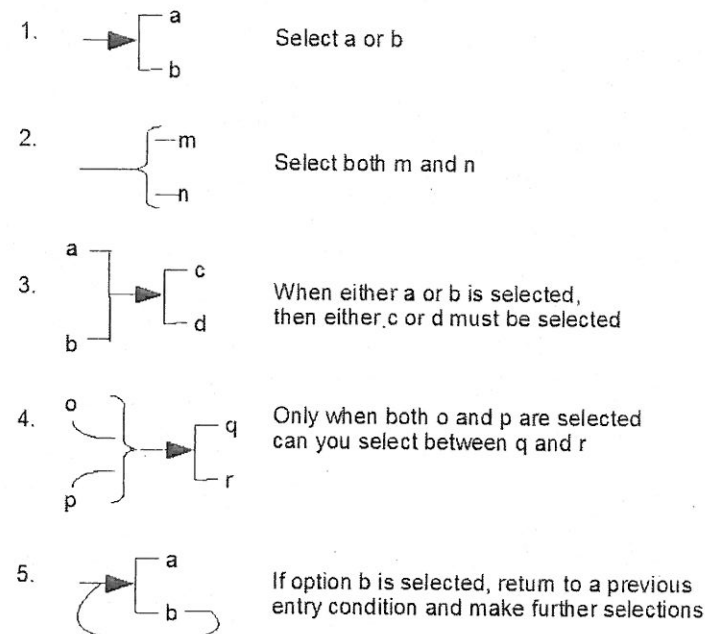


Fig. 1. Network Conventions taken from Butt, D. (2001: 1823)

What the network achieves is an account of all the convergent complexity pertaining to a given node of semantic potential. Halliday's metaphor of choice extends to the concept of mapping: the linguist is mapping the "meaning potential" available to a specifiable community of speakers (what Firth referred to as a "speech fellowship;" Firth 1957 [1950], 186). One can set the scale and human co-ordinates of such mapping to the coverage of a narrow band of textual practice, like a single register (e.g. the language of jazz musicians explaining improvisation). At the opposite pole, one might be concerned centrally with what many (or most) registers share. This would be the pole of 'system,' as opposed to the "instance," in mapping meaning. Between these two poles, there are any number of registers or clusters of language "games" (after Wittgenstein; see Glock 1997, 193-94) which may be of central concern to linguistic enquiry—from political bias in news reports of war to forensic analysis of scraps of written exchanges for courtroom examination. Yet these enquiries rely on the quality of grammars and descriptions of the wider system, which are in their turn enhanced by the actual instances (along with

probabilities) involved in specific registers. The power of one's linguistics is the strength of interplay between these two poles of generalization.

4. Parameters, Networks and "Occasions of [phonetic] Experience"

When we return, then, to the Peking syllable, Halliday shows us how we can manage the complexity with a network which brings the parameters of articulation into a single map. This is a "flow-and-return" model which discriminates between peaks. These peaks, in their form, anticipate a final state (namely, where the syllable is "going"). This contrasts with the situation in Cantonese in which "the features selected at syllable final have little effect on the quality of the vowel" (Halliday 1992, 107). Here are Halliday's observations on this network:

The network combines four principles of analysis. One is the Chinese phonological principle whereby all syllables are structured simply as initial plus final. The second is the Firthian prosodic principle whereby features such as posture (y/a/w) and resonance (nasal/ oral) are treated non-segmentally. The third is the paradigmatic principle whereby features are interpreted as terms in systems, each system having a specified condition of entry. [Note that in Firthian system-structure theory the entry condition is specified syntagmatically, whereas in a system network it is specified paradigmatically: entry to one system depends on selecting a certain term in (at least one) other.] *The fourth is the dynamic principle whereby the syllable is envisaged as a wave, a periodic pattern of movement characterized by a kind of "flow-and-return."* What this last means is that the syllable is construed as a movement from an initial state to a final state, each of these states is specified as a "selection expression" (a cluster of features from different prosodic systems); and there is variation both temporally, in the extent to which a particular feature persists across the syllable, and spatially, in the route that is traversed from the initial to the final state (Halliday 1992, 106-107; emphasis added).

This technique—for managing the relational intricacy of the flow of speech—is a Whiteheadian resolution. It maintains the reality of process while at the same time displaying the dependent relations that motivate enquiry. The metaphors of flow-and-return, of pulse, of rhythmic structure, of legato-like extensions, and of punctiliar dispersions, all provide good service to linguists in conceptualizing linguistic irregular regularities. These terms may not seem surprising given the linguist's attention to sounds. But the value of these terms applies across all the levels of linguistic organization: we can find rhythmic relations (or at least we can usefully apply the metaphor) in semantics, in the deployment of cross-sentence cohesive devices (see the final section of Halliday & Hasan, 1976), in the typical and changing densities of grammatical texture, in the interactive patterns of turn-taking, and even in the visual structures of arts and architecture, which have often been analyzed through semiotic "grammars" closely aligned with techniques of functional linguistics (O'Toole, 1989, 1994, 1995; Kress & van Leeuwen, 1996; Butt, 2003; Stewart, 2002, Chapter 10; O'Halloran, 2004).

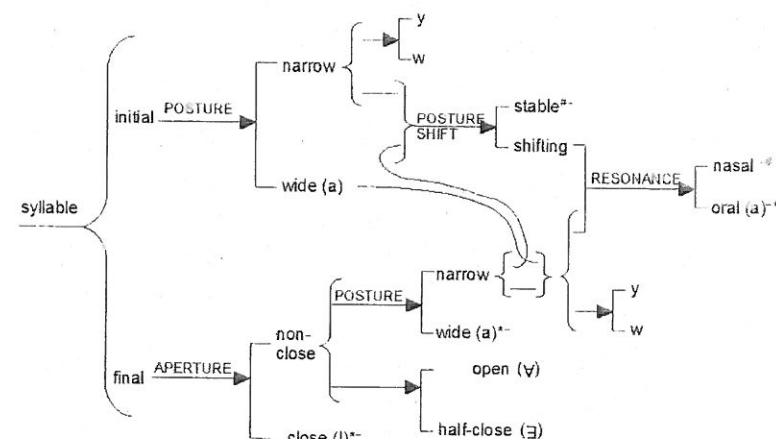


Fig. 2. Network Specifying Syllable Types taken from Halliday, M.A.K. (1992:113)

While "buildings as texts" may provoke groans of "linguistic imperialism" or of "reductionism" (a fashionable charge against structure statements of any kind), it should be noted that architectural structures and analogies from physics, chemistry, mathematics, law, geology, biology and music have all supplied linguists (in all traditions) with ways of discriminating between the intricate relationships of order in language. Verbs are described by their *valence*; grammatical cases are *nuclear* or *non-nuclear* (or *oblique*); there are *strata*; word forms are the *morphology* of the language; we can take measures of lexical *density* and clausal *complexity*; and so on. None of these metaphors prevents a direct engagement with the semantic content of a text. As pointed out by Firth, the terms we use when we "turn language back on itself" (to paraphrase Firth, 1957 [1951], 190) are themselves a form of meaning making (*not* a Platonic universal liberated from the semantic processes it purports to be describing). Exchanges of metaphors are a requisite of our growing understanding in any enquiry. They are indicative of a more general character to knowledge; and they assist in ascertaining how phenomena and relations in one domain of study actually differ from those in another. An analogy is a contract of difference as well as a proposal about similarity.

5. A Science of Relational Values

I have claimed for functional linguistics the status of an emerging science along Whiteheadian lines. In urging this description, I have referred to some general issues (like segmentation and discreteness of units) and I have taken the phonological application of prosody from Firth to demonstrate how the approach is practiced in the quotidian problems of the science. As complex and subtle as the phonological reality appears to be, the whole challenge for relational modeling undergoes inflation when we remind ourselves that Firth's methods utilized (rather than

excluded) the implications of structures from other levels in the realizational codings of codings of codings. We have had to invoke both "word" (from lexicogrammar) and meaning (semantics) in order to encompass unit boundaries and significant contrast in the phonological representation. We should also add that "prosody" addresses a problem that arises at other levels of linguistic description—the issues of process-ness, extended influence, of units and discreteness, and of fluid values (i.e. that changing environments mean that same is different) all arise in the grammar, in the semantics, and (perhaps more obviously) at the level of context. We are dealing with a realizational system; and such systems cannot be productively described if one addresses them through the metaphors of engineers—with inputs/ outputs, serial events, and causation.

The conditions under which linguistics operates are everywhere paradoxical, or at least an inversion of what even specialists might have expected. The study of meaning demands that the metalanguage is always to be renegotiated for each task. No system of categories sits over and beyond the traditions of meaning from which we have drawn those categories in the first place. The difficulty of getting this relativistic message across to the wider public is always daunting. This "ineffability of grammatical categories" (Halliday, 2002) is just what many people—experts and wider community—do not want to countenance. Both the wider public and some experts will have to accept the epistemological limit inherent in the linguist's predicament. It is not that "God plays dice with the universe" of meaning. Rather, it is clear that different dice will be incommensurable (for some purposes, at least) on each throw!

If language pulls people together into semantic transactions, this unifying activity is also the basis for us performing our differences—it is important for society, wrote Firth, that we recognize our "roles," and remember our "lines" as social actors and so on (Firth 1968 [1959], 207). He emphasized that we are, as people and as linguists, concerned with the "typical actual" by contrast with just an "ideal potential" of community behavior (Halliday: personal communication); and this can be pursued productively by diary studies and other instances of close observation, much as social theorists were to argue decades later as "grounded theory" (Glaser & Strauss, 1967). To Firth, however, these recommendations were not novel but clear-sighted advice about what ought to be carried forward from established tradition in linguistics and ethnography.

The critical issue was to ensure that the abstraction of method did not belie the principles of realism and authenticity. Realism requires that we attend to the phenomenon, and authenticity demands that enquiry cannot cut loose from empirical support. Firth (1968, 19) urged the "renewal of connection" with the facts which motivated the investigation. This was, I believe, another one of numerous adoptions of Whitehead's idiom and gnomic insights:

The true nature of discovery is like the flight of an aeroplane. It starts from the ground of particular observation; it makes a flight in the thin air of imaginative generalization; and it again lands for renewed observation rendered acute by rational interpretation (PR 5)

Pattern and Process

Michael Fortescueⁱ

1. The Issue at Stake

Linguists, whether of the formalist or functionalist persuasion, are in the habit of speaking of grammar in quasi-processual terms, as if the patterns they describe and attempt to explain were themselves dynamic entities, whereas what they often are doing is in fact describing static relationships between the layers or modules of their theoretical frameworks which can be "projected" the one onto the other for various explanatory purposes. This has all too often resulted in a thorough ambivalence (if not downright confusion) as to what is best described as enduring linguistic pattern and what is best described as linguistic process. Much of the confusion is due to the conveniences of descriptive practice and the persisting influence of the computational model of thought, and can be avoided if one treats language patterns (individual grammars) in the manner of Whitehead as "eternal objects" that define the grammatical norms adopted by a community and treats linguistic process—the creative application of those norms to the communicative needs of individuals—as "prehensions." This perspective is hardly revolutionary in itself, indeed it is quite reminiscent of the Humboldtian distinction between language as *energeia*—creative human activity—and language as *ergon*—culturally maintained product (Humboldt 1988), but its particular Whiteheadian formulation can help sharpen our understanding of the murky ontological basis of the Saussurean dichotomy between *langue* and *parole* (or, in its more syntactically defined Chomskyan guise, between *competence* and *performance*).¹

What the Whiteheadian perspective more specifically offers modern linguistics is a handle on the psychologically real processes lying behind the deployment of language pattern in thought and communication (two sides of the same coin for Whitehead). By "psychologically real" I do not refer to the level of neurons (which has excited cognitively minded linguists in recent years, perhaps prematurely), but to that of phenomenologically meaningful experience, which must of course in turn be relatable—if only indirectly—to a more inclusive neural "nexus." Many linguists otherwise interested in these matters still tacitly accept the digital computer analogy of the mind/brain, which precludes real-life meaning and intentionality. Even in more recent "neural net" and "connectionist" approaches to language modelling the mind/brain is simply a black box, whose inscrutable "hidden layers" are in themselves quite meaningless. The Whiteheadian perspective allows a degree of penetration into the workings of the black box in terms of his general theory of the conspescence, in so far as this can be applied to neural networks.² It provides a smooth transition between low-level, analogue connectionism and

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