# SYSTEMIC TYPOLOGY AND TOPOLOGY — J.R. Martin & C. Matthiessen

## 0. Taxonomy and ecology

By way of illustrating the problem we are attempting to open up in this paper, consider the following text. A is swimming at the beach and has just spotted a black fin; B knows a dolphin when she sees one and tells A to calm down.

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A:       Help!
B:       - Don't worry,
         it's just a dolphin.
```

A's mistake is hardly surprising. Common sense tells us to be worried about sharks at Australian beaches and suspicious of fins breaking the surface to compete with us for our next wave. Scientifically however the mistake seems a little odd. How can it be that A can mistake two animals that are so distantly related? After all, the biological taxonomy relevant to sharks and dolphins looks is organised as in Figure 1.[1]
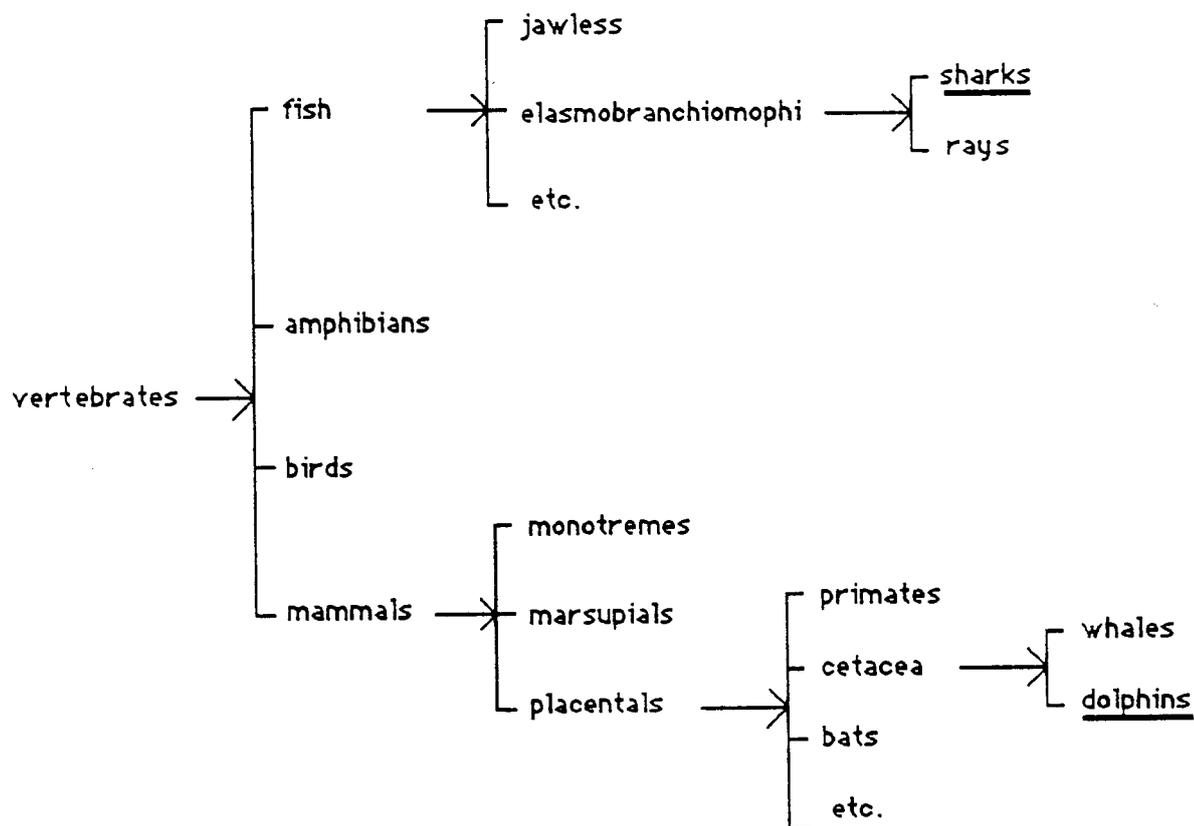


Fig. 1: Taxonomic separation of sharks and dolphins

Taxonomically speaking, dolphins and sharks are as different as monkeys and tadpoles. So it seems odd that a body-surfer would actually confuse the two.

The problem is of course that scientific taxonomies are not based on differences and similarities between animals that can be easily perceived. It's the genes and chromosomes that count, not outward appearances. And how an animal looks on the outside is only indirectly related to its genetic make-up. Environment has a big role to play in how things

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[1] Latin terms have been avoided in this taxonomy where possible. But there are no alternatives as superordinates for sharks and rays, or for whales and dolphins.

look. Because they share in many respects the same ecological niche, sharks and dolphins have evolved from quite unrelated species to adapt to their environment in similar ways. They look same and in many respects function in the same way - but they are not closely related. For this reason most swimmers need some reassurance whenever dolphins are around.

The problem just illustrated is a fundamental one for any form of taxonomic representation. Taxonomies are theories of similarity and difference with respect to particular criteria. Once a criterion, or more usually a set of criteria, is adopted as a classificatory principle then the parameters are set. Things are similar or different with respect to these criteria — this is the information the taxonomy represents. But there are always other criteria that could have been chosen, that have been set aside. And relationships among the things being classified will necessarily look rather different whenever these criteria are taken into account. So a taxonomy is only ever a partial statement of similarity and difference.

Because of this it is very important in science to be clear about the parameters that have been set and to have alternative ways of dealing with those that have been set aside. Some alternatives may develop into research paradigms in their own right; in biology for example, the study of ecology has developed to complement traditional taxonomic studies in this way and many universities now have departments of environmental studies which take a more holistic and ideologically informed approach to studying the world we are failing to share with other phenomena. In this paper we are exploring whether or not a comparable environmental perspective is required in linguistic theory — especially with respect to a theory like systemic theory which places so much emphasis on systemic relations.

## 1. Resource and agnation

In systemic theory, language as a whole is seen as a resource, organized into a number of levels or strata and diversified (most clearly at the content plane) into three generalized metafunctions. The interpretation of language as resource is arguably the centre in a cluster of related theoretical assumptions about language: it leads to language function in context, with text as the basic unit of language; it leads to a metafunctional 'subtheory' of how the resource is diversified, a stratal subtheory of how the resource is distributed into different levels of symbolic abstraction, an axial subtheory of the paradigmatic axis as the fundamental organizing principle of each level of the resource, and so on. The axial subtheory is foregrounded in the name of the theory as a whole — systemic theory. It is, in the first instance, a theory of choice and agnation. It is a theory of what options are available to a language user, how they are related (agnate), and how they are realized. The question of options and their agnation is answered by the system network of systemic theory, which makes explicit how options form systems, sets of alternatives with entry conditions, and how these systems, through their entry conditions, form system networks.

From one perspective, the system network constitutes a theory of typology of linguistic units. As such it differs in significant ways from other formalisms that might be used to represent such a theory — representations like the simple substitution sets used in pedagogical grammars, discrimination networks, and tables (matrices). Crucial differences include the possibility of simultaneous systems, systems with complex (conjunctive and/or disjunctive) entry conditions, and recursive systems. A typology makes explicit how phenomena are related; it is a way of interpreting agnation. But, as Lemke (to appear) has pointed out (see further below), we know from mathematics that there is a complementary perspective on agnation that cuts across typology — topology.

In this paper, we will explore the need for the typological perspective in systemic theory and a division of labour between typology and topology (Sections 3 and 4). But we will begin by examining different kinds of 'multidimensionality' in systemic typology defined

by the different dimensions of systemic theory (Section 2). That is, before we adopt topology in favour of typology for certain purposes, we have to make explicit what the power of the typological perspective is.

## 2. Agnation seen through the prism of systemic theory

Before we explore cases of agnation that are hard to represent systemically at present then, let's review how agnation can be represented in current systemic theory. We will note that agnation is not represented at one rank only nor at one stratum only. Agnation, like other phenomena, is dispersed through the prism of systemic theory.

### 2.1 Basic agnation within system network

By taking a strand of systems in a system network such as the strand of MOOD systems in the clause grammar of English, we can illustrate the basic form of agnation in language as represented in systemic theory (note that the feature 'yes/no' could be added to the disjunctive entry condition of the TAGGING system to allow for the option of tagging a yes/no interrogative clause in Australian English): see Figure 2.
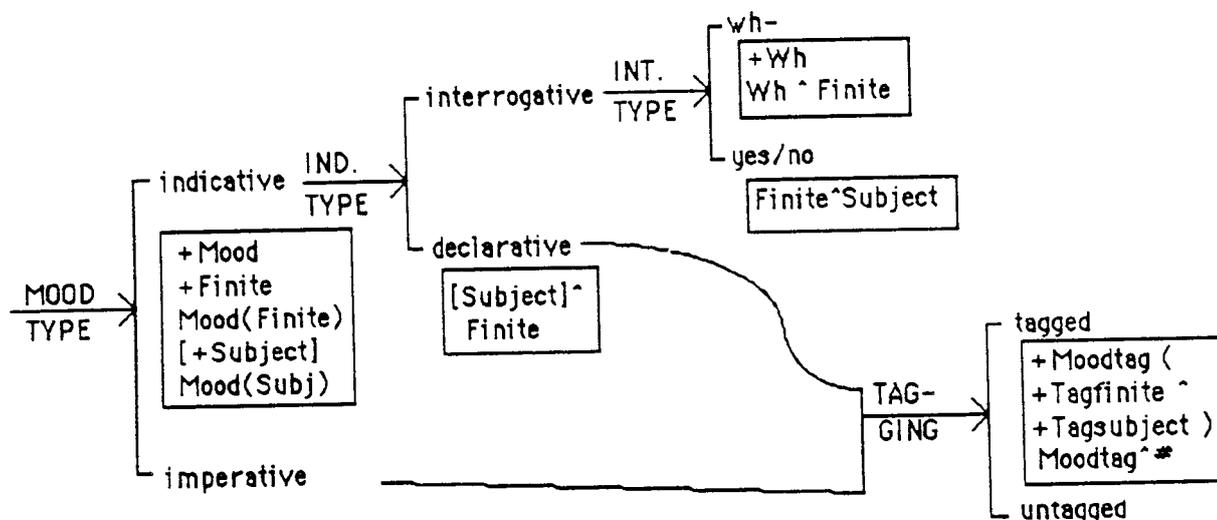


Fig. 2: Agnation in one strand of an English grammatical system network

The agnation represented here is *internal* to the system network: options such as 'indicative', 'imperative', 'declarative', and 'tagged' are related in terms of the systemic relations of alternation within systems and delicacy. The existence of disjunctive entry conditions makes it possible to bring together alternatives within the system network to show how they share options, as in the case of TAGGING in the fragment above. (As noted above, this is one of the respects in which a system network differs from the kind of strict taxonomy that can be encoded in a discrimination network.)

The kinds of systemic oppositions represented in this small network are illustrated below. The realisation rules (in boxes) under features in the network show how the various choices are manifested in structure.

**system:**

| | |
|---|---|
| *Why don't you try a topological orientation?* | [wh] |
| *Couldn't you try a topological orientation?* | [yes/no] |
| *You could try a topological orientation, (couldn't you?)* | [declarative] |
| *Try a topological orientation.* | [imperative] |

structure:

```
Why    don't  you     try          a topological orientation?
Wh     Finite Subject  Predicator   Complement
```

## 2.2 Simultaneous systems

Still within the system network, there may be one or more simultaneous strands such as the mood strand above. The system network thus makes it possible to represent multiple perspectives which intersect to yield multidimensional paradigms. In most general terms, these multiple perspectives typically correspond to the three major metafunctions, as within the clause:

| metafunction | clause systems |
|---|---|
| ideational | TRANSITIVITY |
| interpersonal | MOOD |
| textual | THEME |

But they may also derive from within the same metafunction; for example:

| | |
|---|---|
| ideational: | AGENCY ('middle / effective') & PROCESS TYPE ('material/ mental/ verbal/ relational') & various circumstantial systems |
| interpersonal: | MOOD TYPE ('indicative/ imperative') & POLARITY ('positive/ negative') & VOCATION ('vocative / non-vocative') |
| textual: | THEME ('unmarked / marked') & THEME PREDICATION ('predicated / non-predicated') & CONJUNCTION ('conjuncted / non-conjuncted') |

Some of these simultaneous systems have been interpreted as belonging to separate metafunctions in Fawcett's (1980) version of systemic theory. For instance, he sets up negation as a separate metafunction. However, we can see these additional components simply as more delicate distinctions of Halliday's four metafunctions (just as logical and experiential are subtypes of the ideational metafunction). In fact, there are strong arguments for not separating them out into different metafunctions. For instance, POLARITY systems interact with MOOD systems within the grammatical system network (for example, in the absence of negative exclamative clauses), and also within the semantics. Furthermore, the realization of polarity is of the interpersonal mode — it has the potential of engendering negative prosodies (see Matthiessen, 1988, for further discussion).

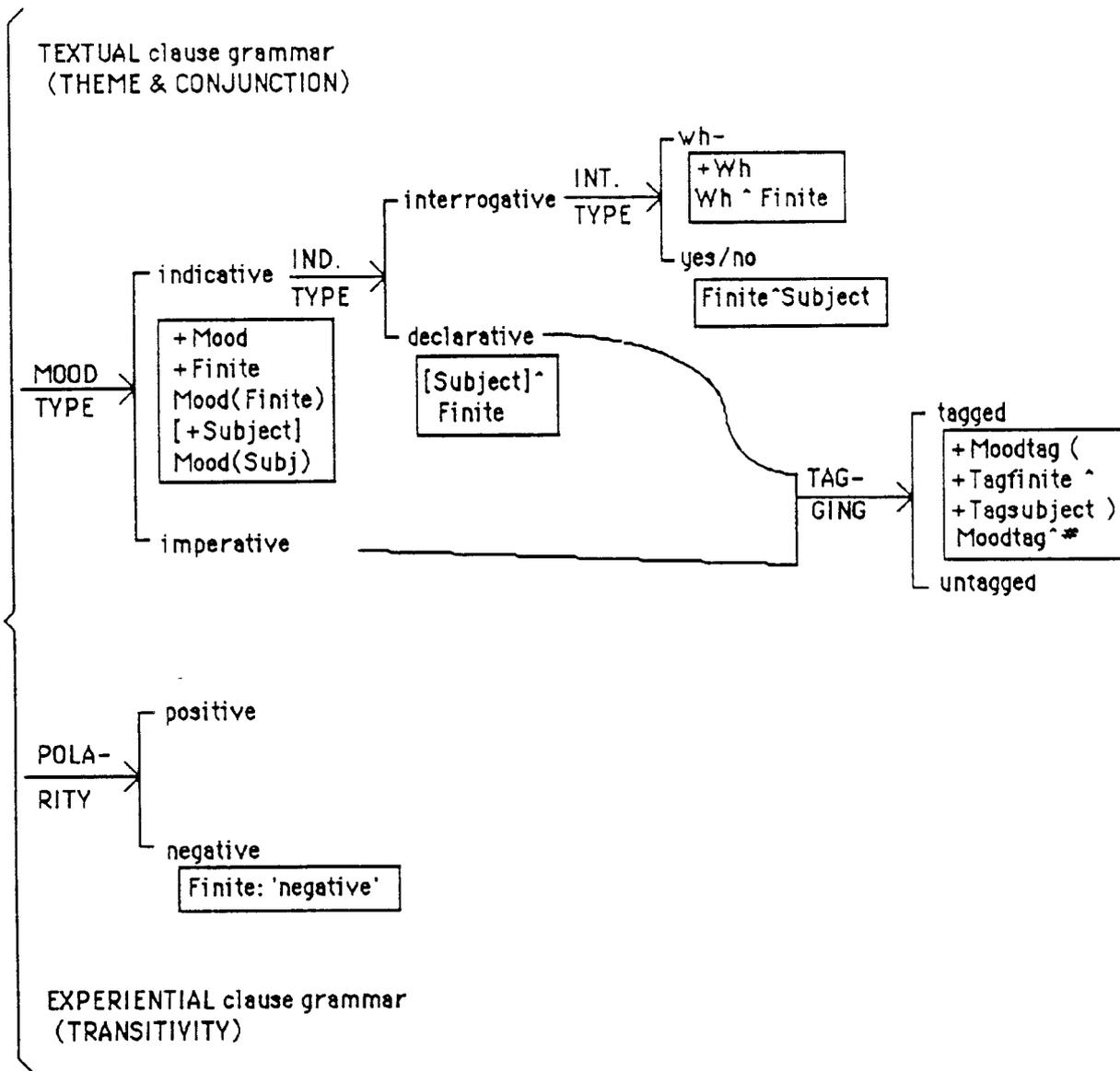The systemic integration of MOOD with POLARITY is illustrated in Figure 3.

Fig. 3: The simultaneous metafunctional perspectives

The structural consequence of system network internal agnation is that realization statements all refer to the same structural unit — clause, group, or whatever.

## 2.3 Agnation outside the system network: stratification and rank

As already mentioned, the possibility of simultaneous systems within the system network allows for multiple perspectives and thus makes it possible to show agnation that cannot be shown within a single strand of the system network. But agnation can also be captured by going *outside* the system network of a given grammatical unit, either by moving across ranks (within the same stratum) or by shunting between strata (across strata). That is, we can show agnation in the system network of another unit related to one under consideration via either the rank scale or stratification. When the representation of agnation is dispersed in this way across more than one system network, the different statements of agnation are, of course, no longer related systemically; rather, they are related realizationally, by means of preselection. Thus a semantic option may be realized by the preselection (across strata) of a grammatical one at clause rank; and that option may in turn be realized by the preselection (across ranks) of another grammatical option at group rank.

In addition to agnation within a single strand of a system network, we thus have three possibilities, viz. simultaneity within the same system network, relationship to system network at another rank, and relationship to a system network at another stratum -- diagrammatically as in Figure 4.
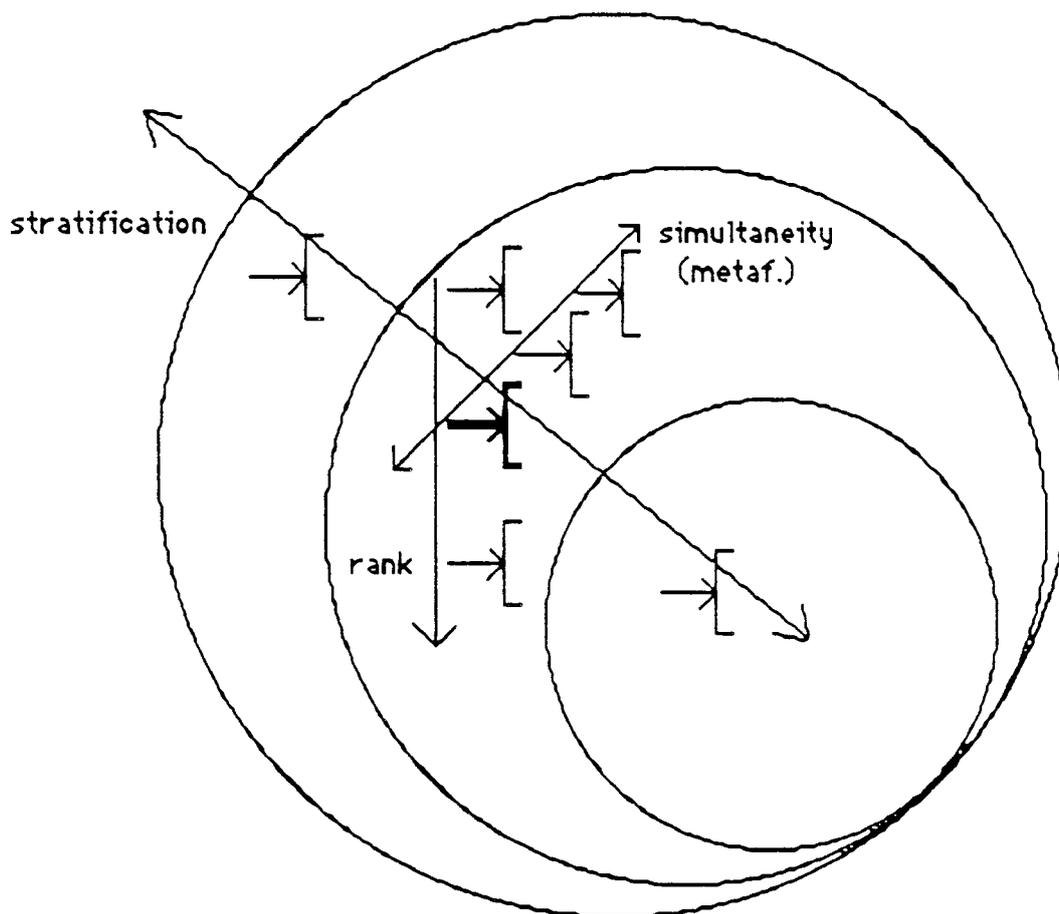


Fig. 4: Different dimensions for representing agnation

(The innermost circle is phonology; it is enclosed within lexicogrammar, which is, in turn, enclosed within semantics; for a discussion of this form of graphic representation of stratification, see Matthiessen & Halliday, 1989.) There is one additional source of multiple agnation that we haven't mentioned or shown in the diagram -- grammatical metaphor (Halliday, 1985: Ch. 10). From the point of view of agnation, it is similar to the introduction of a new stratum or a new metafunction. But it does not function as a new level; rather, grammatical metaphor is a way of using existing resources more than once (to speak somewhat loosely). Consequently, an example like *various physical movements* is related to other systems at clause rank in terms of transitivity and to other systems at group rank in terms of (among other things) premodification.

Interpersonal grammatical metaphor has tended to develop as a theory of interacting typologies. The various options in the discourse semantics network SPEECH FUNCTION are related congruently to specific lexicogrammatical MOOD options (e.g. giving information with declarative, demanding information with interrogative and so on). Incongruent realisations (i.e. the indirect speech acts of speech act theory) are then treated as special cases - as grammatical metaphors (see Halliday 1984, 1985). Reasoning along these lines, a speech act like *Why don't you try a topological perspective?* is semantically a demand for goods and services (a Command) realised incongruently as a wh interrogative (instead of the congruent imperative). This and some alternative possibilities are exemplified below:

Command = [demanding goods & services]

**realised by**

| | |
|---|---|
| *Why don't you try a topological orientation?* | incongruent |
| *Couldn't you try a topological orientation?* | incongruent |
| *You could try a topological orientation, couldn't you?* | incongruent |
| *[(Just as a suggestion), try a topological orientation.]* | congruent |

One way of looking at this kind of interpretation is to read it as indicating that a speech act like *Why don't you try a topological perspective?* has selected twice for MOOD - being both [imperative] and [wh interrogative] in meaning; but one of these meanings is taken as 'deeper' than the other. The depth metaphor predicts which MOOD selection will be typically responded to - namely discourse semantics: *Okay, we will* being preferred to *Because we haven't got time*. It predicts as well the sequence of responses when both selections are picked up - namely, lexicogrammar first (the 'surface' reading), then discourse semantics second (the 'real' reading) as in:

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Couldn't you try a topological perspective?
- Yes, alright.
```

Frustrating the expectations established by these principles is a source of verbal play. The second move in the following attested exchange for example is best made while smiling (A is commenting on an interpretation by B of a piece of student writing):

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A: (suggesting) Why don't you take a step or two further and talk
about what it would take to make the text subversive rather than
just oppositional?
B: - (smiling) I like kids to be powerless.
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Let's consider an illustration of the dispersal of the representation of agnation throughout the linguistic system. Staying with our earlier MOOD example, we can descend the rank scale from clause to group to capture distinctions among interrogative items along dimensions that are not systemicized at clause rank (*who / what; what / which; who / whom* ). We can also move up and down the stratal organization. Moving upwards to semantics, we can represent agnation in terms of a speech functional system network. (We can also posit a higher-ranking semantic system network of exchange, whose options are realized by speech functional selections, which, in turn, are realized by MOOD selections.) Moving downwards to phonology, we can represent agnation in terms of a network of tone options (falling, rising, falling-rising, etc.). Diagrammatically as in Figure 5.
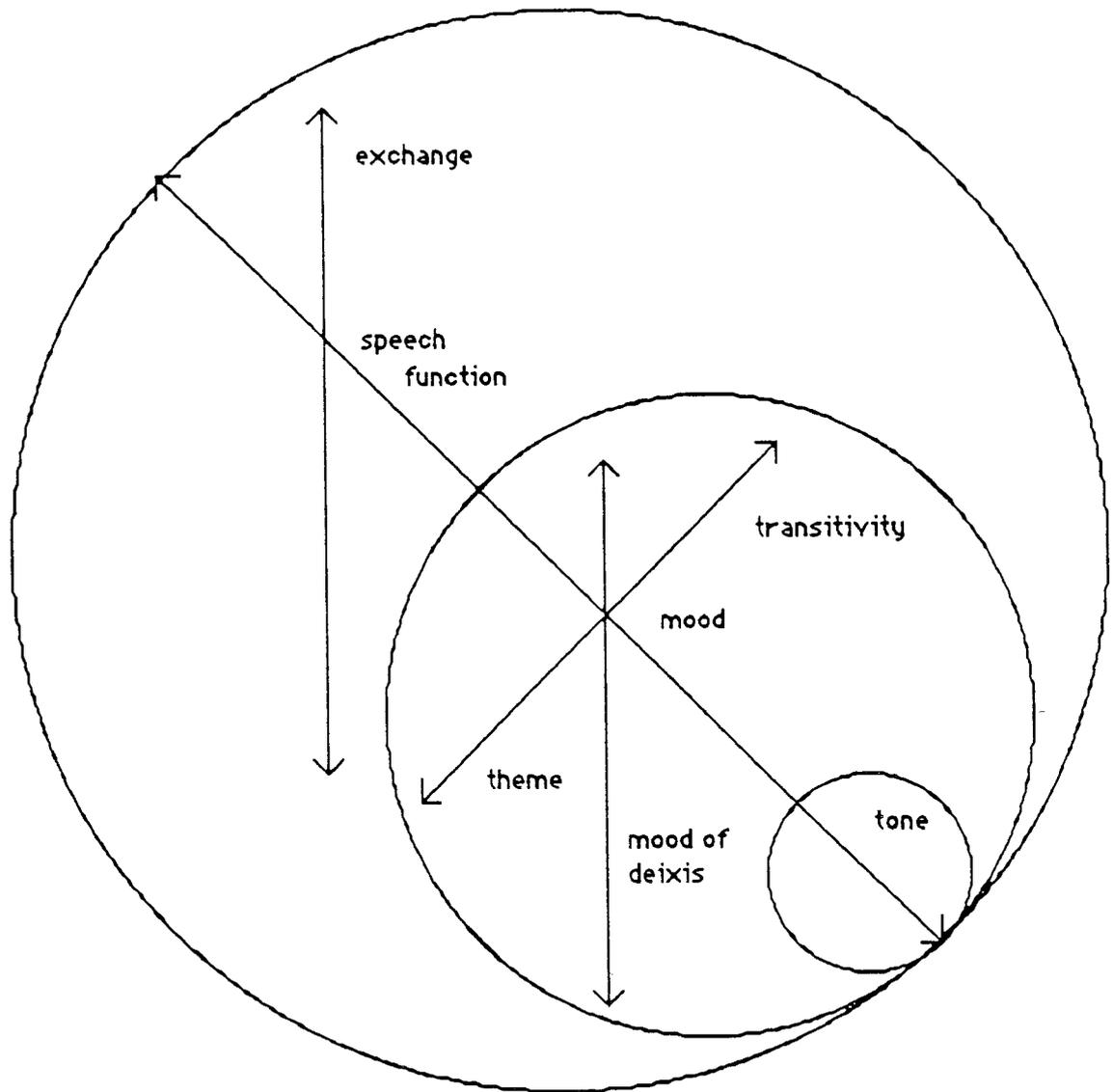
Fig. 5: Dispersal of interpersonal agnation

Note how tracking agnation across strata or ranks may be facilitated by the notion of metafunction. Since ideational, interpersonal and textual meaning is dispersed across ranks and strata in the model, meaning at any point in the system can be related systematically to agnate meanings deriving from the same functional component. Pursuing the interpersonal metafunction, the initiating move in the exchange below can be analysed across strata as follows:

```
Why don't you try a topological orientation?
- Okay, we will.
```

| | |
|---|---|
| DISCOURSE SEMANTICS | [demanding/goods & services/initiating] |
| LEXICOGRAMMAR | [interrogative:wh/negative/addressee-subject] |
| PHONOLOGY | [tone 1] |

And within the discourse semantics the following analyses of both the initiating and responding moves can be provided (see Ventola, 1987, for the interpersonal analyses illustrated here):

EXCHANGE:                          [B-event/action]


                A2                    ^                    A1

MOVES:          [demanding/                                [demanding/
                goods & services/                          goods&services/
                initiating]                                responding to]

                Why don't you...?                          - Okay we will.

Within lexicogrammar, Halliday 1985 strongly foregrounds agnation across ranks within the logical subcomponent of the ideational metafunction by using the same structural notation for complexes at all ranks. For example, the clause, group and word complexes listed below are analysed by Halliday as structurally identical:


|                      | α              | β                |
|----------------------|----------------|------------------|
| clause complex:      | Try topography | when you get stuck. |
| group complex:       | Try            | to get around it. |
| word complex (group):| have           | tried            |


## 2.5 Generalization across strata and ranks

As noted above, simultaneity of systems (cross-classification) tends to be associated with metafunction. And as just illustrated it is  possible to move along the rank scale or the stratal organization and still stay within the same metafunction. This immediately raises the question of what the relationship is between two sets of agnations within two networks related by stratification or rank. The inter-stratal relationship has been explored within stratificational theory in particular, as in e.g. Lamb 1971, Lockwood 1972 who identify diversification, neutralization, portmanteau realization, and composite realization. We find the same type of relations across rank-boundaries. The most powerful generalization is, arguably, that there is a tendency towards **generalization** as we move down either the stratal organization or the rank scale. That is, to put it crudely, a given number of semantic systems is realized by a smaller number of corresponding lexicogrammatical ones; similarly, a given number of lexicogrammatical systems is realized by a smaller number of phonological ones.[2] And the same holds for the rank scale; for example, a given number of clausal systems is realized by a smaller number of verbal group systems. The reason for this state of affairs is easy to see. A stratal descent or a rank descent always entails a generalization across contexts and this generalization is reflected in the relatively smaller number of realizing systems (cf. Lemke, 1982). Let us illustrate this point, first by reference to stratification and then by reference to rank.

**Stratification.** We find 'generalization' as we move from semantics to lexicogrammar and as we move from lexicogrammar to phonology. (i) We shall consider the relationship between lexicogrammar and phonology first. As is well-known, the (relative) arbitrariness and double articulation found as we move across this stratal boundary make it possible for a very small phonological system to realize a very large lexicogrammatical system. This is seen very clearly at the phonemic rank. But even if we consider the rank of tone group, we can note that the system of five (primary, non-compound) tones, falling, rising, level (low rise), rising-falling, falling-rising, serves to realize many more options in key. The reason is quite straight-forward: the systems of key realized by tone selections

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[2] We are limiting ourselves to intonation at the phonological stratum.

are distributed (paradigmatically) across the various MOOD options in the clause grammar, as can be seen in the Table 1 below (based on Halliday, 1967).

| | | | KEY (options across mood types) | | | | |
|---|---|---|---|---|---|---|---|
| MOOD | indic. | decl. | possibility statement | statement | assertion | reservation | contradiction, protest |
| | | inter. wh- | | question | | | (i) tentative [Wh not tonic] (ii) echo |
| | | yes/no | uninvolved question | demand question | involved question | assertive question | (polarity) question |
| | imperative | positive | invitation | command | insistent command | compromising command | question |
| | | negative | prohibition | peremptory | | | |
| | | | ↘ 3 [–] | ↘ 1 [\] | ↘ 5 [∧] | ↘ 4 [∨] | ↘ 2 [/] |
| | | | TONE (primary, non-compound) | | | | |

Table 1: MOOD, KEY and TONE

The KEY systems for the 'declarative' and 'yes/no interrogative' environments are set out in Figure 5.
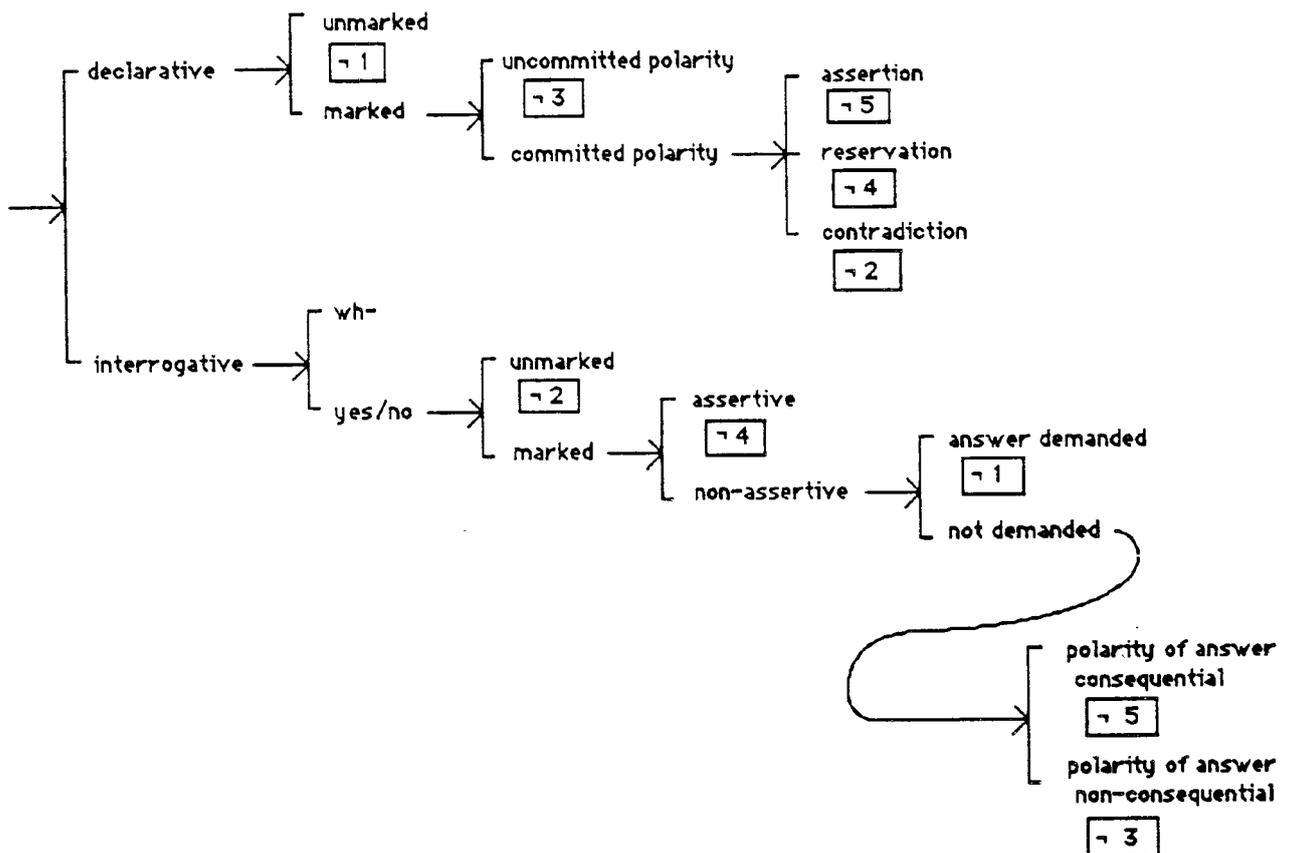


Fig. 5: KEY options realized by TONE selections

(ii) With respect to semantics and lexicogrammar, the principle that the move down in stratal organization embodies generalization may not be as clear as above with lexicogrammar and phonology since both semantics and lexicogrammar as part of the

'content plane' (in Hjelmslev's sense) and they are related 'naturally'. However, if we consider the idea that different contexts of situation correlate with different situation-specific variants of the semantic system — such as the regulatory semantics discussed in Halliday (1973) — the difference in generality between semantics (situation-specific systems) and grammar (one generalized system) can be seen very clearly. In other words, the content system of language has to cope with the tension between unity and diversity; and it does this by engendering diverse situation-specific semantic systems and one generalized grammatical system as shown in Figure 6.
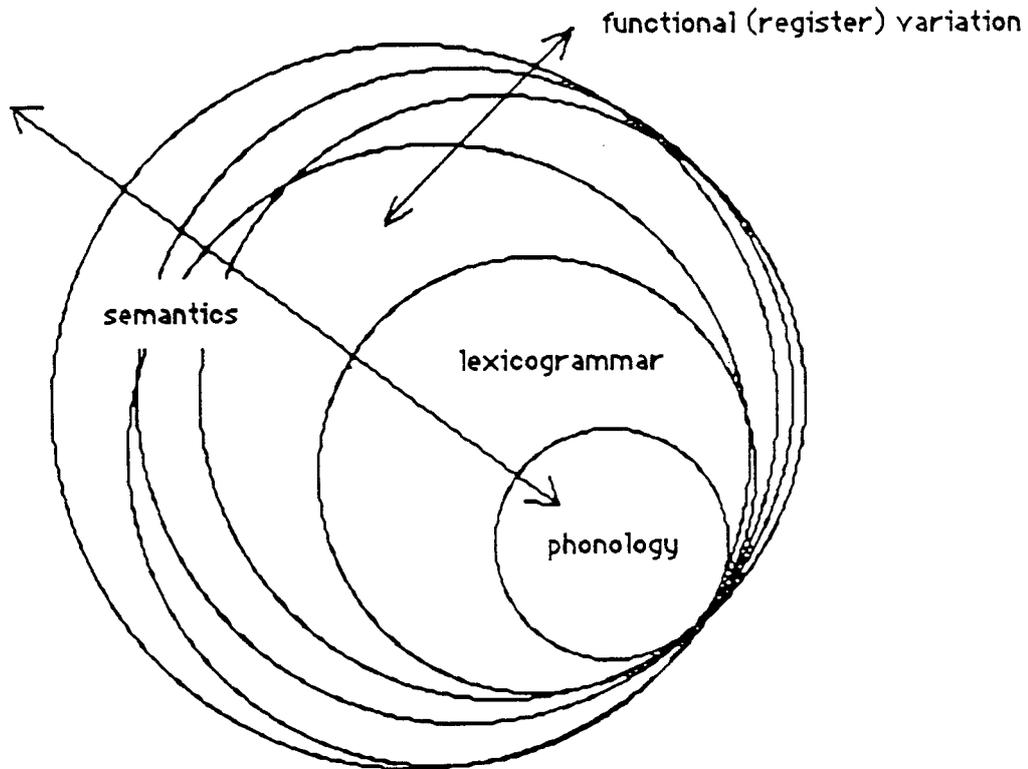
context (different contextual settings)



Fig. 6: Diversity and unity within the 'content plane'

In the example with KEY and TONE, the environments across which the diverse options in KEY are distributed are internal to the system — the options defined by MOOD. In the present example, the environments are external to the semantics — the different contexts of situation.

**Rank.** Since the linguistic resources within a given stratum are ranked, agnations can be stated multiply at different ranks and, as the rank scale is descended, the agnations may be generalized across different higher-ranking contexts. Consider the distinction in the verbal group between perfective and imperfective aspect, i.e., between infinitival and participial form. Looked at from the vantage point of word or group rank, there is this single systemic distinction: 'perfective / imperfective' (e.g., *to do / doing* ). However, if we take the clause as the vantage point, we find the more functional differentiation; the single verbal group system 'perfective / imperfective' corresponds to a number of functionally distinct systems in the clause, each of which has a pair of features, one of which preselects 'perfective' while the other preselects 'imperfective'. As a result, the realizational move down the rank scale is, in this case, a generalization of a number of distinctions — diagrammatically:
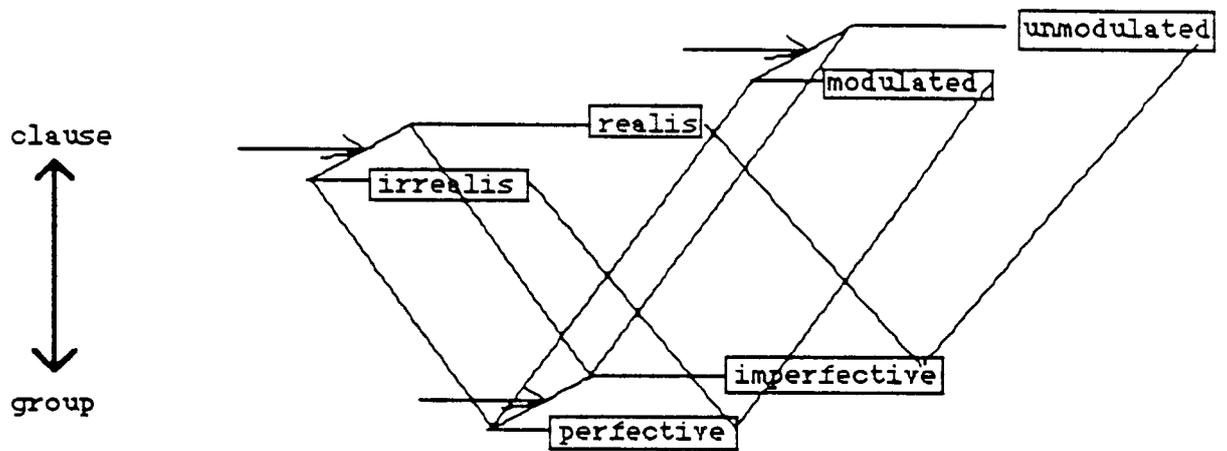
Fig. 7: Differentiation (clause) and generalization (group)

For instance, the following clause types have different 'aspect' systems, corresponding to the single verbal group system perfective / imperfective:

- rankshifted, elaborating clause [restrictive relative clause]: modulated / unmodulated

> (modulated:) The man to do the job is Henry 'who can/should do'

> (unmodulated:) The man doing the job is Henry 'who does/is doing'

- dependent, enhancing clause: irrealis / realis

> (irrealis:) Henry left to rehearse his part

> (realis:) Henry left rehearsing his part

Here are some further examples of clause contrasts other than the two mentioned above:

- dependent, extending clause: opposition grammatically conditioned by a connective such as *rather than* and *instead* :

> Rather than leave, Henry rehearsed in the kitchen

> Instead of leaving, Henry rehearsed in the kitchen

- rankshifted, 'act' clause as serving as Phenomenon in perceptive clause: bounded / unbounded:

> (bounded:) We saw Henry leave when we arrived

> (unbounded:) We saw Henry leaving when we arrived

- rankshifted, 'act' clause as Subject:

> To be or not to be is the question

> Being at home all day is not the problem

A similar kind of examples can be drawn from MODALITY in English. Halliday (1970; 1985) shows how there are two broadly different systems in the clause -- indicative MODALITY (MODALIZATION), the scales of probability and usuality from possible and 'sometimes' to certain and 'always', and imperative MODALITY (MODULATION), the scales of obligation and inclination from allowed and willing to required and determined. At verbal group rank, these two realms of modalities are generalized as the system of modal auxiliaries (cf. Halliday, 1970): see Figure 8.
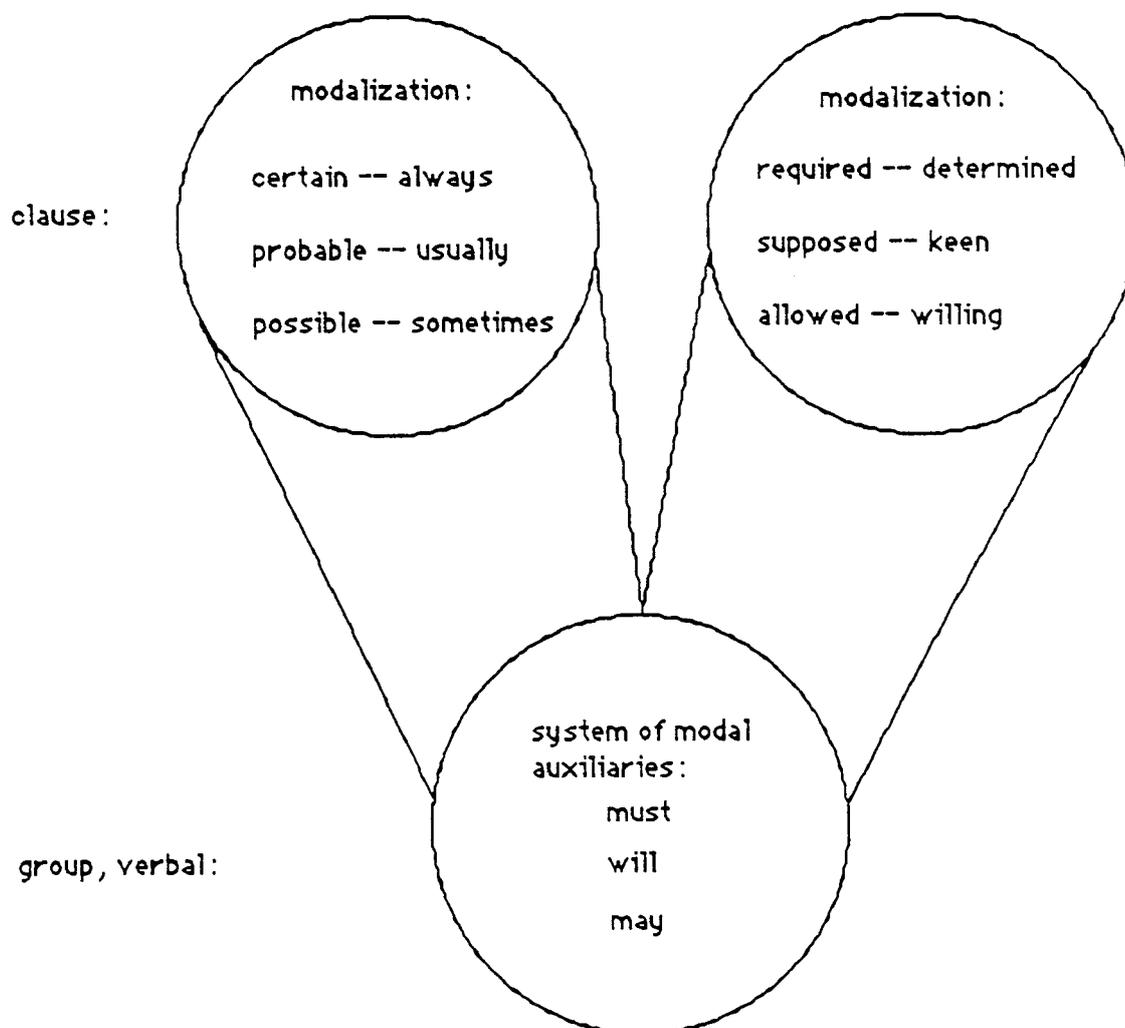


**Fig. 8:** Generalization of MODALIZATION and MODULATION
in system of auxiliaries

The difference across clause rank and group rank has considerable significance for the stratal relationship between grammar and semantics. In a systemic account, the relationship is stated in the first instance at the highest rank at which it occurs and since a systemic grammar of English is clause-based, the relationship will be stated for clausal systems, where the agnations are distributed across different (paradigmatic) contexts such as enhancing vs. elaborating. In contrast, traditional grammar started with lower-ranking systems; it was essentially word-based. So we would have to try to come up with an abstract pair of semantic glosses for the group distinction perfective / imperfective reflecting the degree of generalization the distinction embodies and we would also have to list the various uses of the forms out of their clausal contexts. Similar examples could be given from TENSE, VOICE, TRANSITIVITY, PERSON, and so on.

## 2.6 Dispersal across strata and ranks

We have noted that moves down across strata and ranks often entail a generalization: more options (in different environments) are realized by fewer options. One case in point is

MODALITY, where MODALIZATION and MODULATION are generalized in the system of modal auxiliaries. MODALITY also illustrates another phenomenon in the move from higher to lower strata/ ranks. This is the **dispersal** of realizations of a higher system across different environments at a lower stratum/ rank. Thus the system of MODALITY (MODALIZATION and MODULATION) at clause rank is realized at group rank[3]

(i) adverbially (MODALIZATION): *perhaps, possibly, certainly; sometimes, usually, always* &c.

(ii) verbally --

(1) through modal auxiliaries (MODALIZATION/ MODULATION): *may, will, must;* &c.

(2) through conative verbal group complexes (MODULATION): *is obliged to, is supposed to, is allowed to; is determined to, is keen to, is willing to* &c.

The higher system is more **holistic**; it spans the full range of meanings realized by the lower systems. Consequently, it is possible to show agnations between sets of items that are construed in different environments by the grammar, e.g. *perhaps : probably : certainly :: may : will : must :: possible : probable : certain.* Grammatical metaphor may create agnations between environments that are dispersed too far apart within the lexicogrammar for them to be brought together easily within a more holistic grammatical system. For instance, grammatical metaphor creates an environment for MODALIZATION 'outside' the clause (in the congruent reading) -- in clause complexes such as *I think/ believe/ guess* | | *they have already left* (see Section 3 for further discussion).


## 2.7 Plane: the contexts of language

Before turning to the question of missing agnation in section 3, two further descriptive resources need to be considered. The first has to do with the semiotic environment in which language means -- the issue of planes (this section). The second has to do with one's orientation to both system and text as process and product -- the issue of synoptic or dynamic perspectives (Section 2.8 below).

Pursuing the first issue here, the point that needs to be made is that the notions axis, metafunction, rank and stratum developed to this point have to be contextualised. Language realises context -- it construes, is construed by and reconstrues, symbolically, the social system (see Halliday 1978). This means that systemic relations at all levels within language can be projected onto a model of context in such a way as to bring out further dimensions of agnation. The contextual systems are interpreted as connotative semiotic systems, i.e. semiotic systems realized by other semiotic systems (cf. Hjelmslev's 1943 discussion of *denotationssprog* and *konnotationssprog*). Martin 1986 provides one extravagant example of a projection of this kind, with three orders of contextual semiotic systems -- ideology, genre and register: see Figure 9.

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3 MODALITY may also be realized in yet other environments -- (i) *I think ...* 'perhaps' &c.; and (ii) *it is possible that ...* It is a kind of systemic prosody; and as such it increases the potential for prosodic realization, e.g. *I think it may perhaps not be a bad idea after all.*
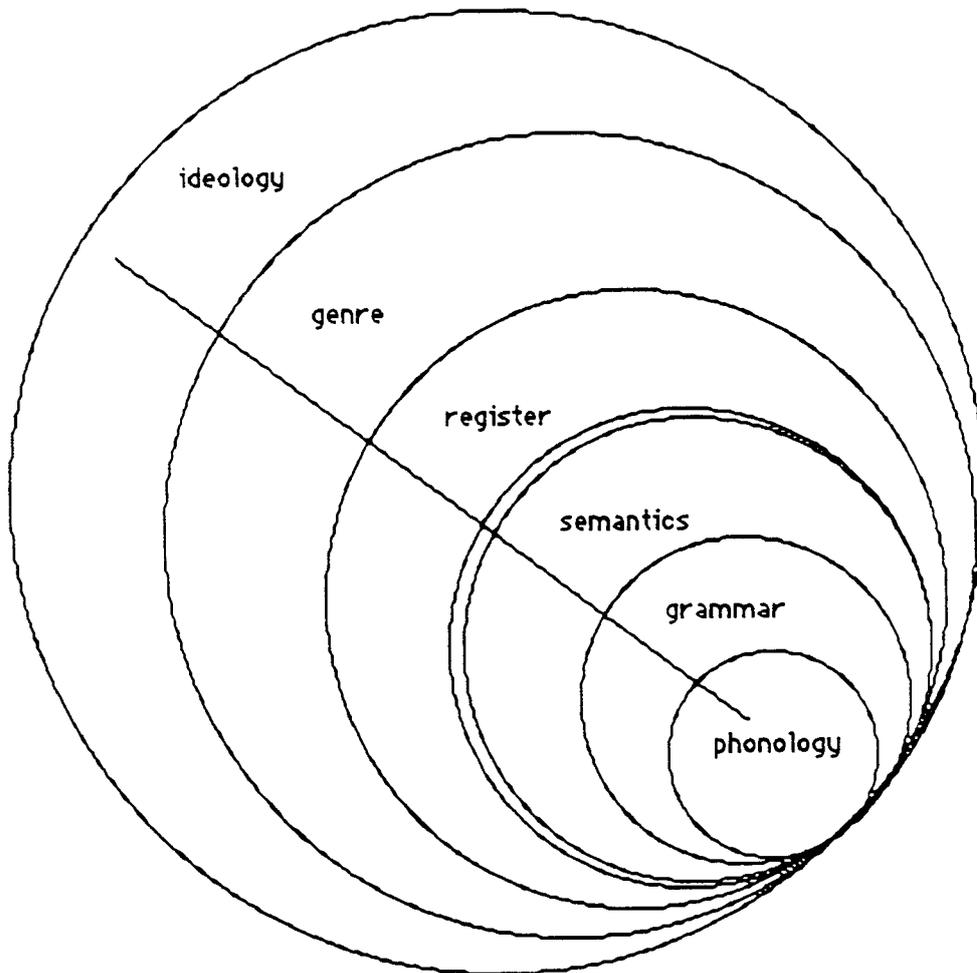
Fig. 9: Language and its semiotic environment

Setting aside the levels of ideology and genre here, the register variable tenor for example can be used to further develop the interpretation of the exchange *Why don't you try a topological orientation? - Okay, we will.* Following Poynton 1984, 1985 we can ask questions about the kind of interpersonal relations realised: is the **status** of the interlocutors equal or unequal as reflected in the reciprocity or non-reciprocity of the choices selected?; are the interlocutors in frequent or infrequent **contact** with each other as indicated by the proliferation of choices taken up and the degree of contraction in their realisation; and what degree of **affect** is realised, measured with respect to amplification. The example being considered is too short to provide satisfactory answers to questions such as these. But once considered as part of a longer text, the exchange could be interpreted along these lines - recontextualised as it were on a higher plane.

| Tenor variable: | realisation principle: | tentative analysis: |
|---|---|---|
| STATUS | (reciprocity) | unequal? |
| CONTACT | (proliferation; contraction) | low? |
| AFFECT | (amplification) | -- |

## 2.8 Perspective: synoptic and dynamic

Martin 1985 explores the question of simultaneous synoptic and dynamic perspectives on system/text, pointing out some of the problems with linguists traditional synoptic stance, which for systemic linguists involves typology as dominant descriptive tool. The short-

comings of this stance can be exemplified with respect to exchange structure by considering texts such as the following (symbols as in Ventola 1987):

| | | | |
|---|---|---|---|
| Why don't you try a topological perspective? | A2 | | |
| - Topological? | cf | | |
| - Yeah, you know, like in maths. | rcf | K1 | |
| - Huh? | - | cf | |
| - You know that paper of Jay's - | - | rcf | K1 |
| - No... | - | - | K2f |

Here, the initial demand for goods & services cannot be negotiated until its experiential meaning is further explored. But this exploration is unsuccessful, since the interlocutor being positioned as secondary actor has never heard of topology, does not appreciate its significance in mathematics and hasn't seen Jay Lemke's paper. Not only does the initial exchange not reach closure, but the interlocutors end up negotiating something very different from what they began with. Interactions of this kind are quite systematic, but not predicted by system/structure theory at the rank of exchange; nor, Martin argues, is it obvious how present synoptic descriptions could be extended to account for this and related phenomena (see Ventola 1987 for further discussion at the level of genre). The general thrust of the argument is that by emphasizing the paradigmatic, and abstracting away from direct representation of sequence in text, systemicists put themselves in the position of not being able to account for choices which depend on just where in the unfolding of a text the realisation process has reached (unlike Firth in other words, elements of structure do not act as entry conditions for paradigmatic selections). Accounting for these structure dependent choices, which take into account the meanings that have so far accumulated and where the text is going next then becomes the responsibility of dynamic representations, a frontier area of research in systemic theory (see Matthiessen 1988; Bateman 1989).

## 2.9 Summary

All of the various dimensions discussed to this point in the paper are presented typologically in Figure 10 (a network at the level of field, mapping part of the organisation of systemic linguistic theory). This allows us to position the new dimension being opened up in this paper — the typological/topological one — as one with a synoptic and a paradigmatic focus (thus the conjoint entry condition).
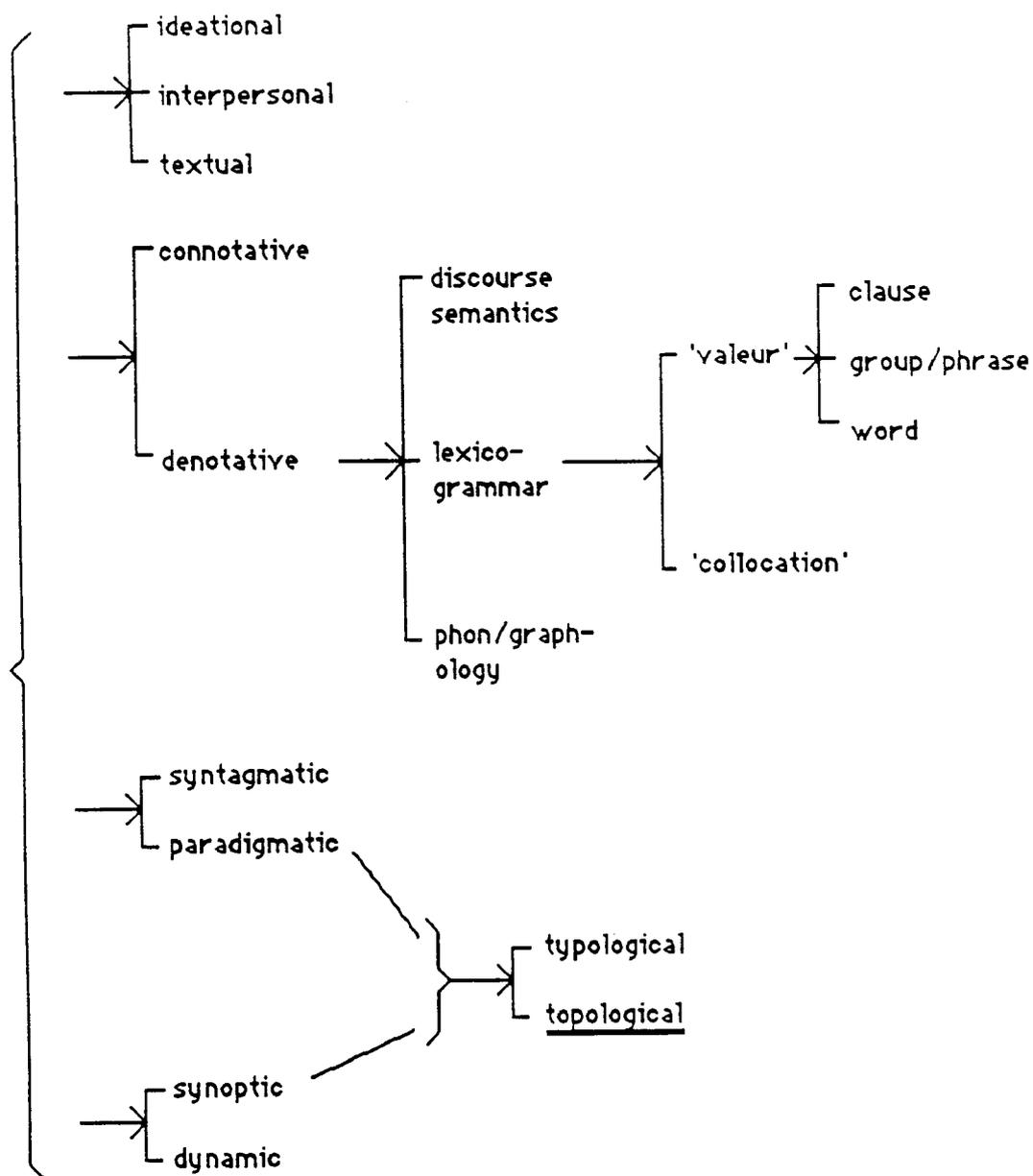
**Fig. 10:** Metalinguistic resources

Taking into account the dialectic of realisation interfacing these dimensions, an alternative form of representation, in the form of a helix is presented below. This presentation is topological rather than typological – a spatial metaphor is used to connect levels as a process of realisation. For reasons of space we cannot explore the helix in detail here. Basically it maps realisation as a two-way process looping through strata and planes while returning at each level to recurrent metafunctional themes (the 'columns' that can be read across levels). It is to topological representations of this general kind that the paper now turns.
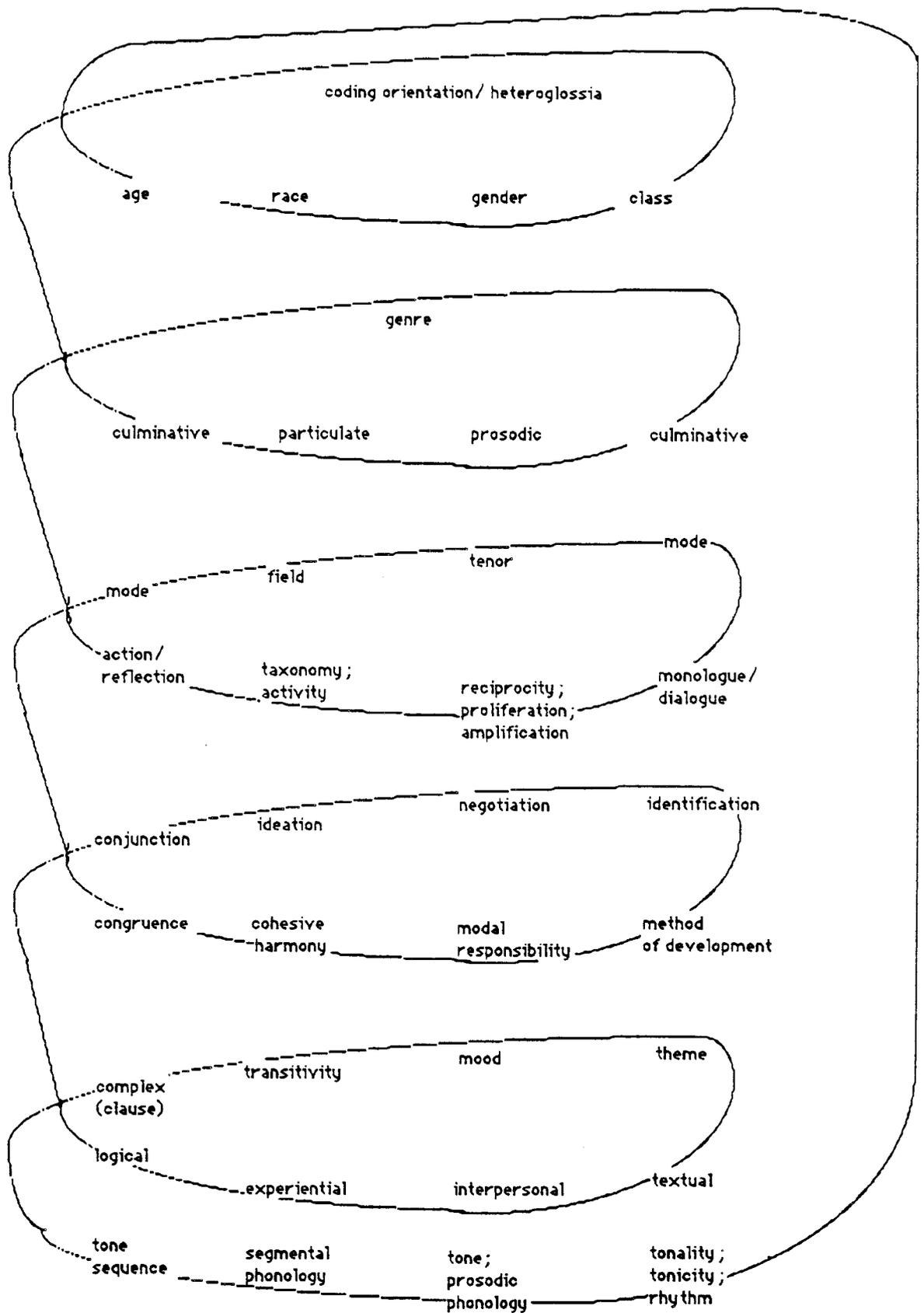
## 3. Agnations not accounted for

We have seen how agnation may be 'dispersed' across metafunctions, ranks, strata and planes and that complementary synoptic and dynamic perspectives can be adopted to develop further inter-connections. This makes it possible to capture relatedness with variation in metafunctional domain as well generality. In spite of the various possibilities for representing agnation that we have reviewed — all of which are, of course, quite well-

known – we encounter agnations that are hard to represent in a satisfactory or clear-cut way. We will draw examples from all three metafunctions.

## 3.1 An experiential example: behavioural processes

An example from experiential clause grammar will be considered first. Halliday's 1985 account of process type distinguishes three main classes of clause - material, mental and relational; Halliday goes on to consider three additional types which are closely related to each of these - behavioural, verbal and existential respectively. If we formulate these proposals systemically, adding labels to generalise across material & behavioural (doing), mental & verbal (semiosis) and relational & existential (being), we arrive as a process type network such as the one in Figure 11.

```
                          ┌─ material            They attacked
              ┌─ doing ──→┤
              │           └─ behavioural         They frowned
              │
              │           ┌─ verbal              The asked
PROCESS  ────→┤           │                  ┌─ perceptive   The saw it
  TYPE        ├─ semiosis─┤                   │
              │           └─ mental ──→─ affective      They liked it
              │                               └─ cognitive    They knew it
              │                                             They were foolish
              │           ┌─ relational
              └─ being ──→┤
                          └─ existential         There were tanks
```
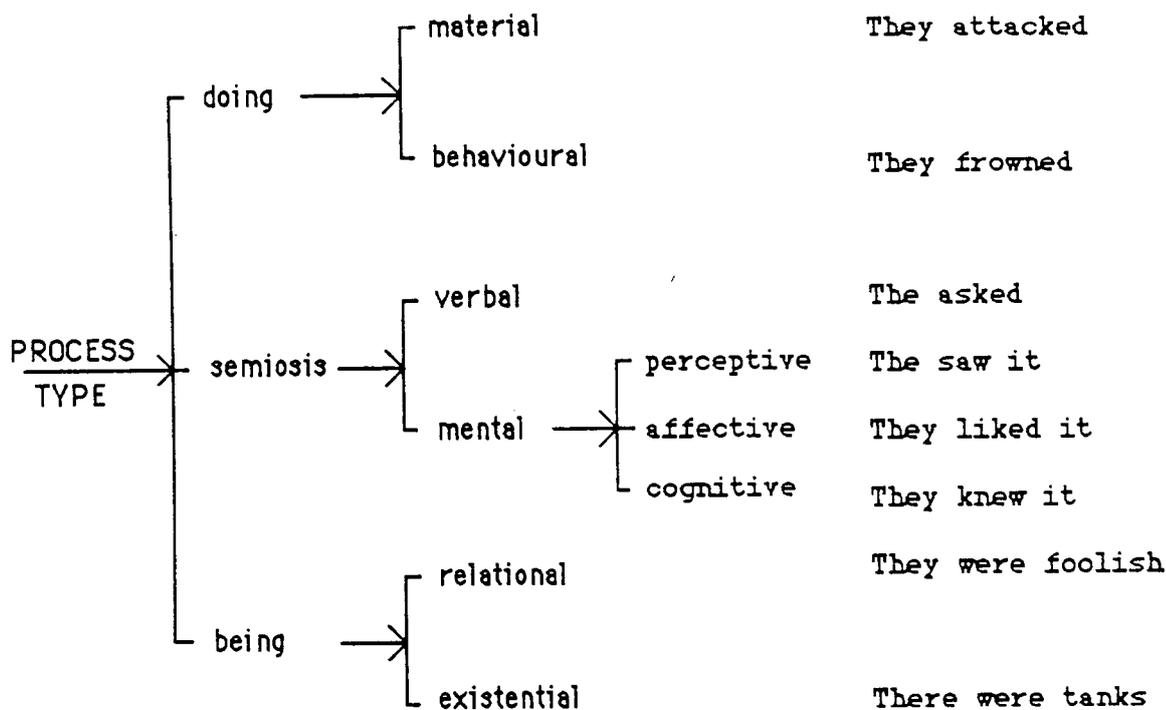
Fig. 11: Process typology (i)

Our focus here will be on behavioural processes. Essentially these are middle voice action processes with a conscious Medium. They use 'present in present' tense to construct ongoing action:

    She's already speaking.

And they cannot report:

    *She's speaking that changes must be made.

Taken together these criteria led Halliday to group behaviourals with materials. He notes however that behavioural processes are also relatable to mental and verbal ones; the presence of one conscious participant is evidence that some such association might be found. In addition, although they cannot report, behavioural processes can be used to quote:

    "Changes will be made", she smiled.

What seems to be going on here is that behavioural processes construct saying, thinking, feeling and perceiving as action, in terms of their outward physical manifestations. As such they are all associated with one or another verbal and mental process, and in some cases with relational processes as well (because of an association between mental and relational processes which will not be further explored here). Some examples of the agnation series suggested here are listed below (for further discussion of these relations see Matthiessen 1989):

```
talk/say

He is talking to them right now.
  [behavioural]
He says that he's rather concerned.                [verbal]


listen/hear

I'm listening at the moment.                       [behavioural]
I hear that you've been concerned for some time.   [mental:percep]


smile/like/be happy

He is smiling at them.                             [behavioural]
He likes them.
  [mental:react]
He is happy with them.                             [relational]


ponder/wonder/be in doubt

He is pondering their question.
  [behavioural]
He wonders whether they were right.                [mental:cognit]
He is in some doubt about their concerns.          [relational]
```

The process type network outlined above does not capture these similarities. It claims that behavioural and mental processes are quite different (like sharks and dolphins). It would of course be possible to revise the network, moving behaviourals into the signification class. In effect this would be to give more weight to the presence of a conscious participant in behavioural sand their ability to project (by quoting): see Figure 12.
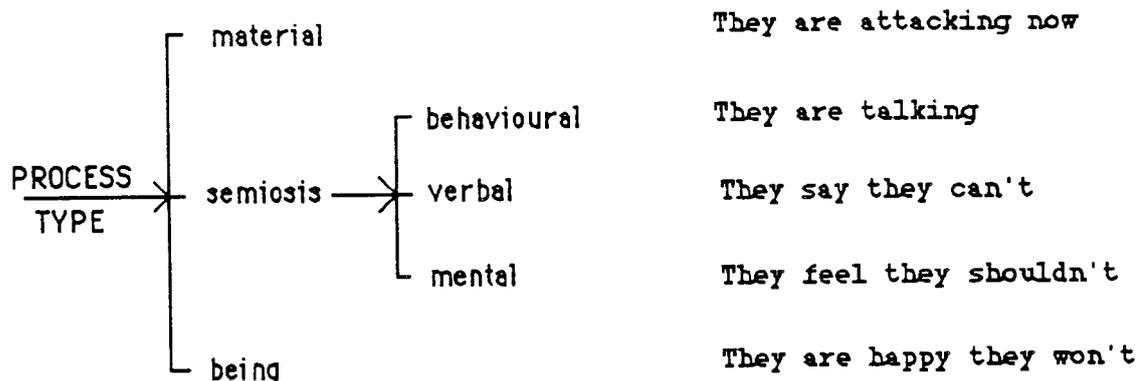


Fig. 12: Process typology (ii)

But note that this would still not capture the relationship between behavioural and certain attributive relational processes. And more seriously it loses the previously established relationship between material and behavioural processes as far as tense and reporting are concerned:

TENSE:

| | | |
|---|---|---|
| *They are talking about it.* | behavioural: | present in present |
| *They say they will.* | mental: | present |

PROJECTION:

| | | |
|---|---|---|
| *\*They talked that they couldn't.* | behavioural: | no hypotactic projection |
| *They said they wouldn't.* | mental: | hypotactic projection |

What we find here in other words is a genuine **tension** in the system. There are parameters along which behaviourals resemble material processes and other parameters along which they resemble mental and relational ones. Depending on which parameters are taken as criterial at primary delicacy, behaviourals can be grouped with materials or with mentals and verbals but not both. The criteria deployed at primary delicacy thus become thematic for the description. They act as its point of departure and circumscribe the agnation which can be established. In typological work, all points of departure foreground some criteria and background others. With phenomena such as behavioural processes this means that some agnation must be lost in the process of classification. The typology is limited in just this respect.

### 3.3 An interpersonal example: MODALITY

Let us now pursue this problem with respect to the interpersonal metafunction, focussing on MODALITY. Central to any discussion of probability in English the consideration of modal verbs and adjuncts (Halliday 1970/1976; 1982; 1985). Median probability for example can be realised verbally as Finite or adverbially as Mood Adjunct in the clause (or 'prosodically' in both functions):

| | |
|---|---|
| It **would** be behavioural. | modalised Finite |
| **Probably** it's behavioural. | Mood Adjunct |

But beyond this, there is a range of MOOD resources that can be used to mediate the certainty of a proposition, including tagging and interrogatives:

| | |
|---|---|
| It's behavioural, **isn't it**? | declarative tagged |
| **Isn't it** behavioural? | negative yes/no |
| **Why wouldn't it be** behavioural? | negative wh modalised |

And moving across metafunctions, experiential options can also be brought to bear on the question of speaker certainty:

| | |
|---|---|
| I **reckon** it's behavioural. | mental projection |
| I'm **sure** it's behavioural. | relational fact |

As with SPEECH FUNCTION and MOOD, this kind of dispersal of agnation has been handled through the concept of grammatical metaphor (e.g. Halliday 1985:334-340). Developing an interpretation along these lines would mean establishing a generalised probability network in the discourse semantics and allowing for diversified realisations in lexicogrammar.

Alternative realisations:

```
[I reckon it's behavioural.]        mental projection
[I'm sure it's behavioural.]        relational fact
It would be behavioural.            modalised Finite
Probably it's behavioural.          Mood Adjunct
It's behavioural, isn't it?         declarative tagged
Isn't it behavioural?               negative yes/no
Why wouldn't it be behavioural?     negative wh modalised
```

One of the main weaknesses with this approach to mediating certainty is that it does not specify how the alternative realisations are graded with respect to each other. It says how they are the same semantically (i.e. triggered by the same discourse semantic feature), and it shows how they are different grammatically. But it does not say how they are semantically different. Simply augmenting one typology with another does not capture the various ways in which alternative realisations complement each other in occupying the same semantic space. For this some mechanism is required which will show how realisations are more and less alike, not just how they are typologically different.

### 3.3 A textual example: thematic resources

Before pursuing this problem of gradience below, let us consider one final example from the textual metafunction. Halliday 1968, 1985 (see also Chapter 12 in Kress 1976) has noted the significance of first position in the English clauses for the realisation of Theme and considered the way in which different selections for Theme may be more or less marked for a given MOOD. In declaratives for example, a Complement/Theme is marked in comparison with Subject/Theme.

```
(Typology's a worry), but topology I'd recommend.      marked
Topology'd be recommended by Jay.                      unmarked
```

Developing this point, Halliday notes the significance of IDENTIFICATION -- an experiential system put to work by the textual function with a view to organising Themes in reversible relational clauses:

```
Topology is what Jay would recommend.      THEME
What Jay would recommend is topology.      IDENTIFICATION
```

Taking grammatical metaphors of the ideational variety into account, nominalisation is a further resource that is used to group meanings as Themes:

```
Jay's recommendation would be topology.      nominalisation
```

Once again, there is nothing in the grammar that shows how these divergent resources for marking Theme are related to each other. And resorting to grammatical metaphor and stratification to handle this area once again fails to account for gradience. The point is that quite different parts of the grammar as it is currently systemicised can be seen in certain contexts to do very similar work. Typology does not account for how this work is parcelled out across grammatical systems.

## 3.4 An interpersonal example -- MODALITY; gradience across systems

Before turning to the problem of formulating topological descriptions in Section 4 below, let us return once again to the problem of gradience or clines. To this point we have been mainly concerned with gradience across systems -- how it is that distantly related grammatical classes construct closely related meanings. But gradience is also found within particular areas of the grammar, among closely related systems. The area of MODALITY, introduced above, provides one clear example.

As noted by Halliday 1985, MODALITY and MODULATION can be interpreted in terms of degrees of certainty and obligation associated with propositions and proposals respectively. His interpretation of these scales, incorporating the closely related semantics areas of usuality and inclination is outlined below in Figure 13.

MODALIZATION
'indicative' type

MODULATION
'imperative' type

positive

[probablity]          it is                    [usuality]          [obligation]          do!          [inclination]

certainly          it must be          always          required          must do          determined

probably          it will be          usually          supposed          will do          keen

possibly          it may be          sometimes          allowed          may do          willing

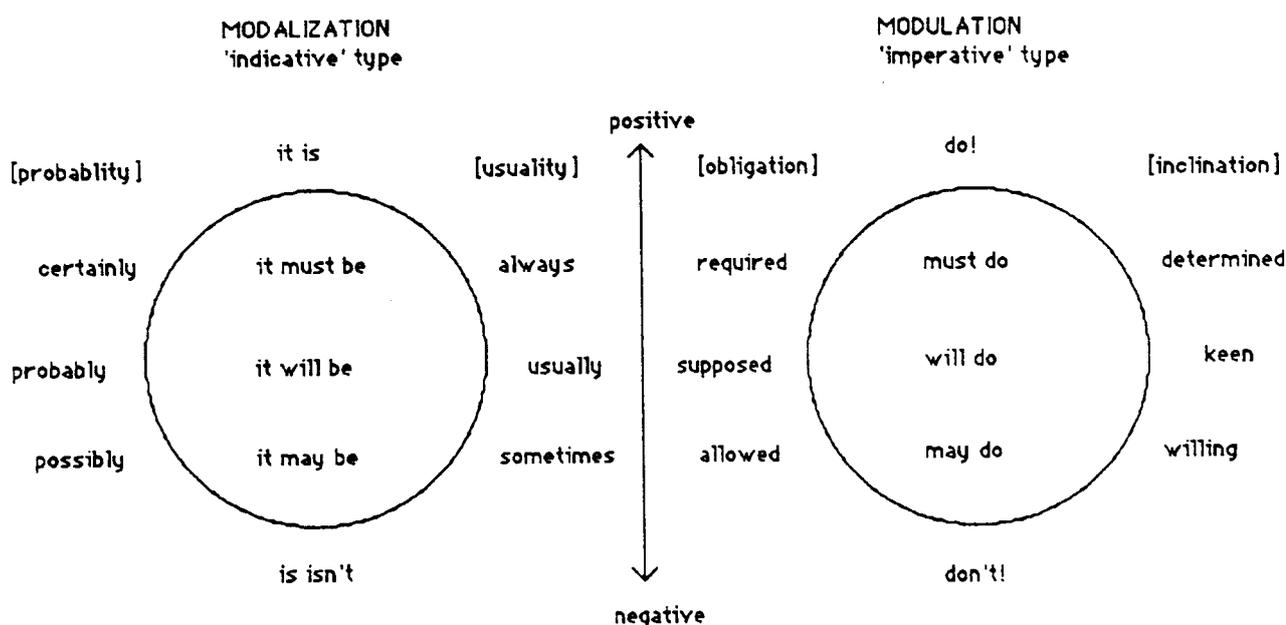is isn't          negative          don't!

Fig. 13: MODALITY as cline

An interpretation such as this suggests that a system like MODALITY should be represented systemically as a cline: see Figure 14.

MODALITY
─────────────  ┐ high
VALUE          ┤ median
               └ low

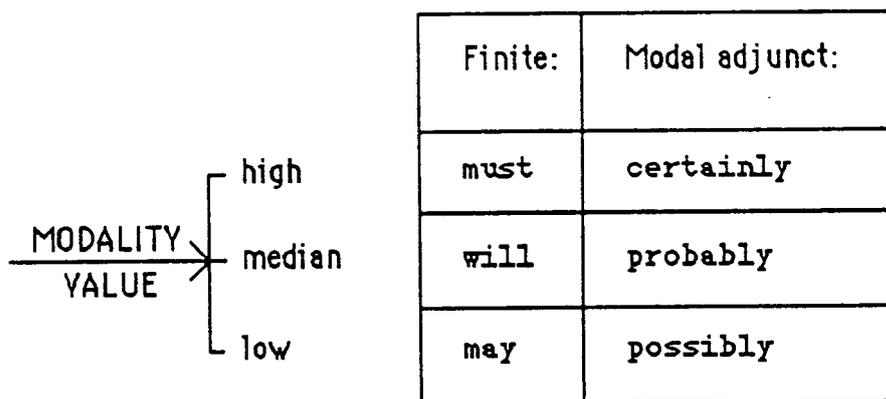| | Finite: | Modal adjunct: |
|---|---|---|
| high | must | certainly |
| median | will | probably |
| low | may | possibly |

Fig. 14: MODALITY values (i)

But there are strong grammatical arguments for not representing MODALITY gradiently in this way. This is that median modalities interact with negated theses differently that high and low valued ones. Consider the following proportionalities:

```
It is probable that it didn't work out:
It is not probable that it worked out:
It won't have worked out::

It is possible that it didn't work out:
It's not certain that it worked out:
It may not have worked out::

It is certain that it didn't work out:
It is not possible that it worked out:
It can't have worked out
```

The problem is that *It's possible that it didn't* means the same thing as *It's not certain that it did* at the same time as *It's certain that it didn't* means the same as *It's not possible that it did*; but with the median modality, *It's not probable that it did* means the same as *It's probable that it didn't*. This line of argumentation leads Halliday to oppose median modalities to outer ones in the grammar, network as below. In this network the terms are not graded, and so their complementarity in the semantic space of certainty is not adequately mapped.
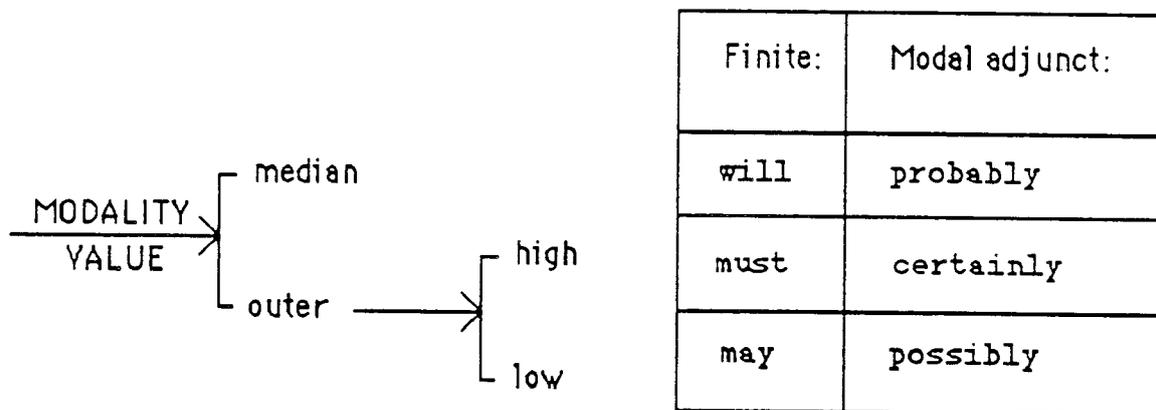


| Finite: | Modal adjunct: |
|---------|----------------|
| will | probably |
| must | certainly |
| may | possibly |

MODALITY VALUE — median / outer — high / low

Fig. 15: MODALITY values (ii)

## 3.5 Over-determined border areas: blends

We have seen that there may be border areas in a semantico-grammatical space such as the space of processes; for instance, behavioural process lie between material ones on the one hand and verbal and mental ones on the other. However, there is also another type of border phenomenon — the problem of **grammatical blends**. Here we face the problem of *over-determination*. Particular phenomena are equally well classes in different ways; the typology does not resources for distinguishing between them.

One well-known example of a blend of this kind has to do with drawing a line between certain receptive mental processes and attributive relational ones. *I'm surprised he's here* for example can be equally well treated as mental or relational:

MENTAL/RELATIONAL (overdetermination):

```
I'm surprised he's here.
```

| I | am surprised | (by the fact that) he's here |
|---|---|---|
| Senser | Process | Phenomenon |

| I | am | surprised (about the fact that) he's here |
|---|---|---|
| Carrier | Process | Attribute |

Note that it would be misleading to treat *I'm surprised he's here* as both mental and relational as resorting to the notion of grammatical metaphor might imply. Blends are not metaphors -- one thing on the 'surface' and something else 'underneath'. Rather they are hybrids -- partly one thing and partly another. Typologically they are overdetermined -- and stratification does not sort the problem out. There is a genuine gradience present which a typological orientation obscures.

Another example of blending is found in the area of symbolization (see Halliday 1985: 154). Verbal, mental and relational clauses of the following kind are so closely related that it is difficult to find criteria allocating them to one process type rather than the other.[4] And once an allocation has been made, them something of the similarity among them has been lost.

VERBAL:

| The results | indicate | to me | that typology won't work. |
|---|---|---|---|
| Sayer | Process | Receiver | (Verbiage) |

MENTAL:

| The results | convince | me | (of the fact) that typology won't work. |
|---|---|---|---|
| Inducer | Process | Senser | Phenomenon |

RELATIONAL:

| The results | prove | to me | (the fact) that typology won't work. |
|---|---|---|---|
| Assigner | Process | Angle | Token |

## 4. Topological description

Up to this point in the paper we have focussed on problems -- the limitations of typological description in the face of an accumulation of linguistic phenomena. We will now turn to the problem of addressing these phenomena in positive terms, developing topology as a complementary orientation with strategies for handling agnation which current systemic description resources do not manage effectively. Note that in taking this step we are arguing that the phenomena we are considering are unified and can be positively characterised in some respect; they are not simply a rag-bag of left-overs that typological analysis fails to explain.

---

[4] Note that the verbal example is very close to the relational 'prove' example; if, however, the Sayer is a speaker (or writer), the clause is removed from this area of blending: *Carl and Charles indicate to me that typology won't work* / *"typology won't work"*. It is not longer possible to interpret *Carl and Charles* as being related as Token to *that typology won't work* as Value.

## 4.1 The notion of topology

Lemke (no date), in a very helpful unpublished paper, introduces a complementary topological perspective at the level of genre, making use of arguments closely related to those developed in Section 3 here. He characterises his topological orientation as follows:

> A topology, in mathematical terms, is A SET OF CRITERIA FOR ESTABLISHING DEGREES OF NEARNESS OR PROXIMITY AMONG THE MEMBERS OF SOME CATEGORY. It turns a 'collection' or set of objects into a *space* defined by the relations of those objects. Objects which are more alike by the criteria are represented in this space as being closer together; those which are less alike are further apart. There can be multiple criteria, which may be more or less independent of one another, so that two texts, for instance, may be closer together in one dimension (say horizontal distance), but further apart in another (vertical distance). What is essential, obviously, is our choice of the criteria, the *parameters*, that define similarity and difference on each dimension. These parameters can be represented as more or less alike. The same set of parameters allows us to describe both the similarities and the differences among texts, or text-types (genres). [Lemke, n.d.]

We can explore the relationship between typology and topology by means of two analogies (see Figure below). Imagine a system of rivers originating from one spring (1), flowing happily in separate beds and branching off (2) into additional rivers, fanning out along a coast line. The coast line is very flat and the soil is soft so the estuaries of what were once separate rivers will merge together. Similarly, imagine trying to represent the differences and similarities between the darker areas of the figure to the right below. If we take each black core as the starting point, the grouping is clear enough; but the peripheral areas are much more difficult to assign to one node or another in the taxonomy designed to show how the dark areas are related. The are clearly grey border areas.
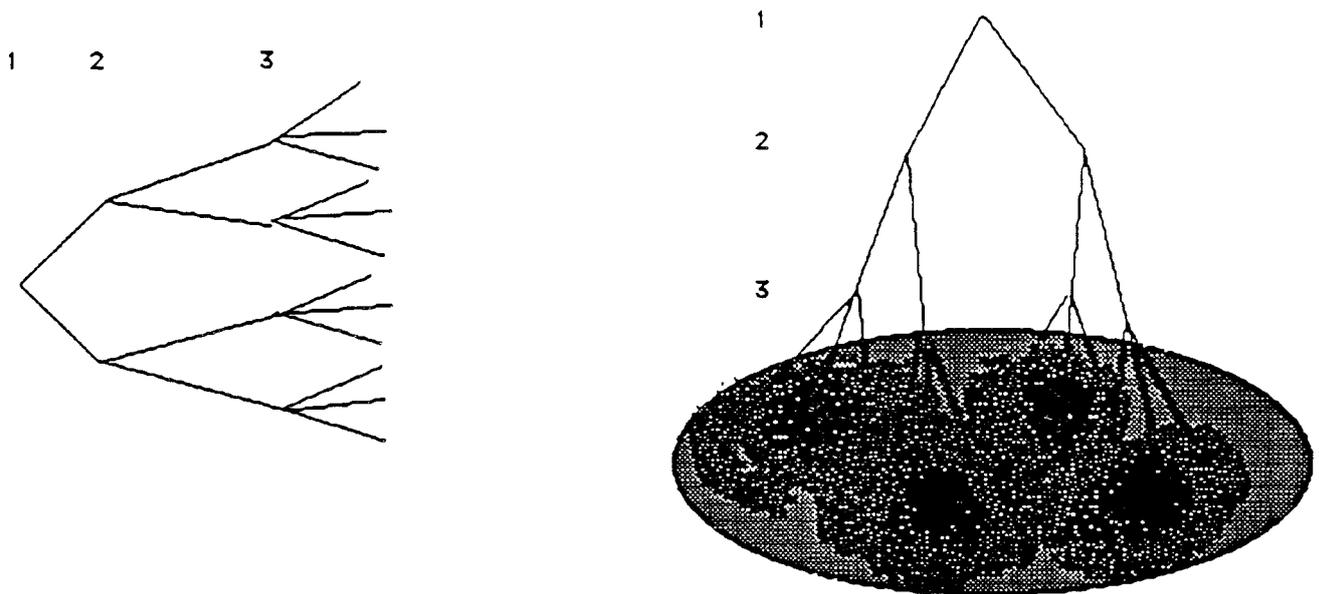


Fig. 15: Typology and proximity

In neither case would it be appropriate to abandon the distinctions made. The earlier stages (1 and 2) are quite distinct and while further differentiations may turn out to merge with others they need not. And, in the figure to the right, as long as we focus on the core, the darker areas are also quite distinct. So we need some form of interpretation that will allow us to capture the higher-level and core distinctions as well as the grey boundary areas. Both of the examples given above concern arrangements in physical space; typological considerations concerning grouping according to difference and similarity are a matter of relative location in that space. Expressed as a proportionality:

similarity : difference ::
proximity : remoteness

Now, it is possible to transfer the reasoning about space to abstract domains, as we do when we talk of semantic spaces (or, for that matter, semantic fields or domains). Indeed, this is not a new perspective in systemic theory. Halliday (1961: Section 2.2) identifies cline as one of three types of scale:

> ... I have used the terms 'hierarchy', 'taxonomy', and 'cline' as general scale types. A hierarchy is taken to mean a system of terms related along a single dimension which must be one involving some form of logical precedence (such as inclusion). A taxonomy is taken to mean a special type of hierarchy, one with two additional characteristics: (i) there is a constant relation of each term to the term immediately following it, and a constant reciprocal relation of each to that immediately preceding it; and (ii) degree is significant, so that the place in order of each one of the terms, statable as the distance in number of steps from either end, is a defining characteristic of that term. A cline resembles a hierarchy in that it involves relation along a single dimension; but instead of being made up of a number of discrete terms a cline is a continuum carrying potentially infinite gradation.

We can thus see a 'space' as being extended along one or more clines.[5] A cline or a set of intersecting clines may have a 'core' region – as in the traditional notion of 'core meaning' or 'cardinal vowel'. Movement away from the core along any of the clines will to more peripheral regions – more peripheral members or subtypes, or, we could say, more 'distantly related', in reference to Wittgenstein's family metaphor (cf. Daniel Jones' conception of the phoneme as a family of sounds). This phenomenon has studied extensively in terms of the notion of *prototype* in a series of studies by Eleonor Rosch and others; it has been applied to the nominal and verbal domains in grammar by Hopper & Thompson 1983. 'Prototype' is perhaps typically characterized in cognitive terms; but this is, of course, in no way necessary. It is perfectly possible to reason about prototypes semiotically.

Before further developing the interpretation of agnation and 'space', we'll introduce some linguistic examples. The best known are probably phonological or lexical. For instance, vowel systems are interpreted in terms of a vowel space with cardinal vowel locations; allophonic variation occurs in the regions around the cardinal locations. Thus an imaginary four-vowel system can be described both typologically, as front/ back & high/ low, and topologically; the diagram in Figure 16 illustrates the complementarity between the two perspectives.
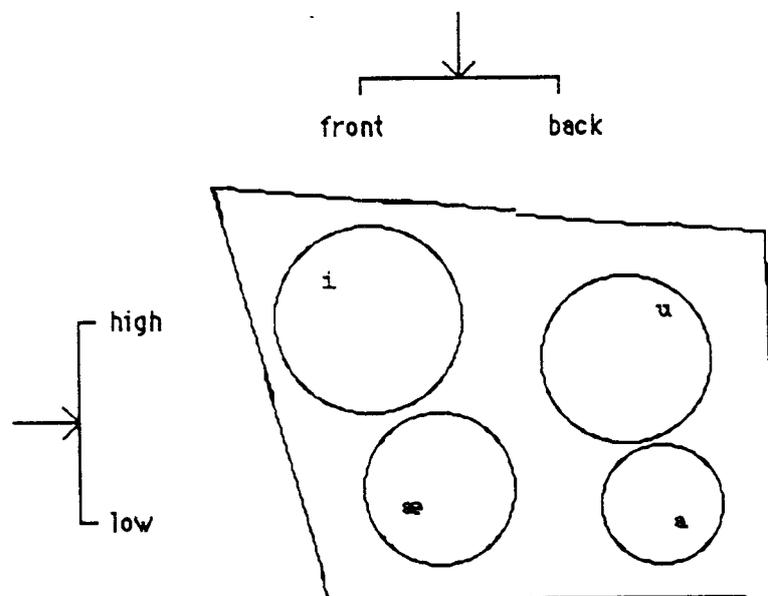


Fig. 16: Vowel typology and topology

---

[5] Since Halliday's 1961 discussion of clines, similar abstractions have been discussed outside of systemic linguistics in approaches to syntactic categories -- squishes, continua, etc.

Here however we'll draw on the grammar for examples.


## 4.2 Processes as topological space

We will pursue the notion of space and parameters with respect to experiential clause grammar (see Section 3.2 above), elaborating on the kind of material, behavioural, relational tension introduced above. To begin we will circumscribe the semantic space under consideration, with four process types defining points on its circumference: material, verbal, mental and relational. This gives us the frame of reference for our topological description - the semantic space bounded by notions of happening & doing, saying, sensing and being & having.

Having located the focus of our description in this way we go on to define topological parameters. Proceeding in this way these turn out to be characterisations of the gradience we can specify among the four points defining our semantic space: see Figure 17.
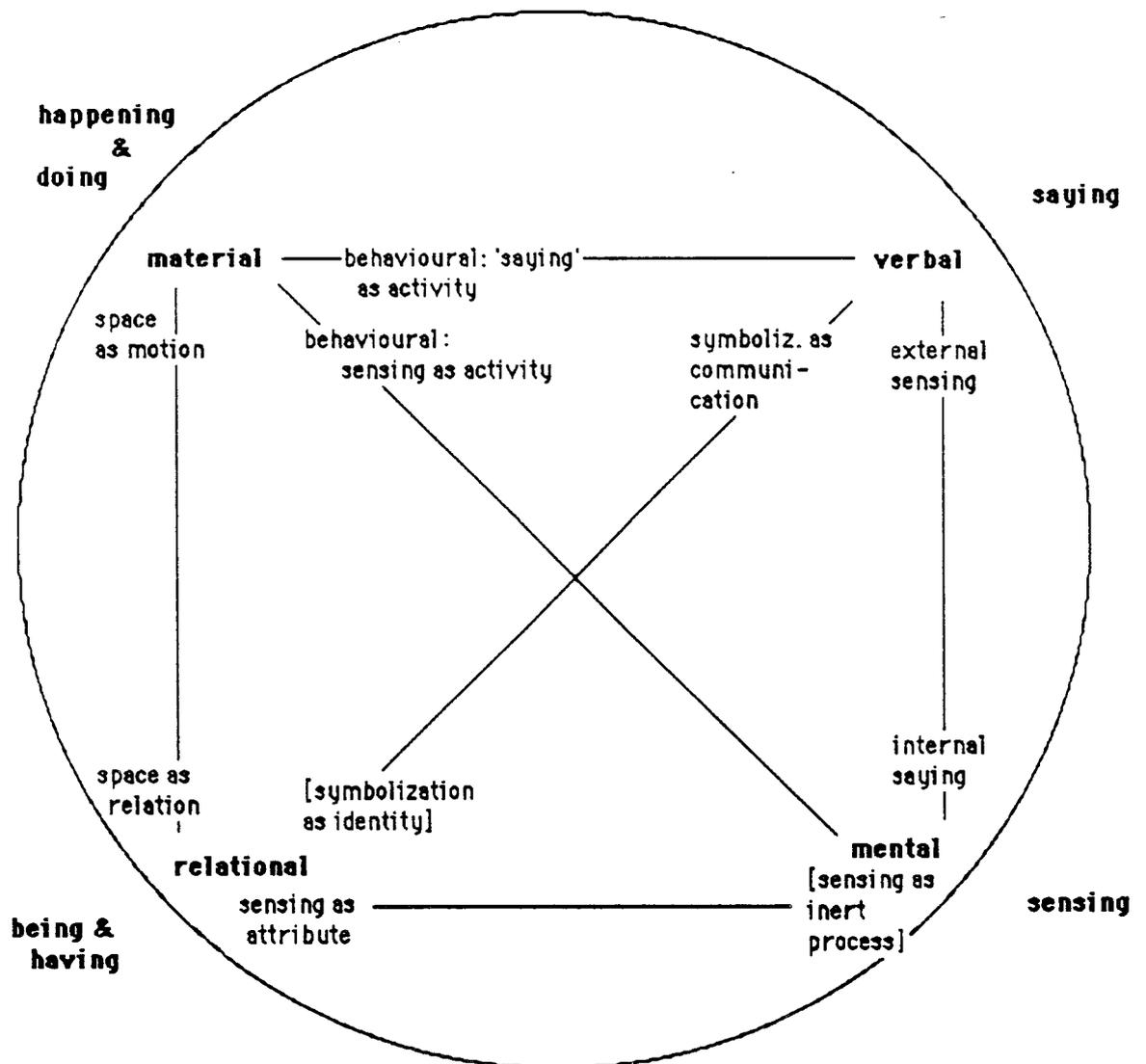


Fig. 17: Topological parameters for English TRANSITIVITY

The clines are exemplified below.[6]

| Typological<br>oppositions | Topological<br>parameters |
|---|---|
| | |

(1) behavioural region

(i) behavioural: material-verbal:

| "Come here", he groaned. | saying as activity |
| "Come here", he asked. | saying as communication |

(ii) behavioural: material-mental:

| He watched them pulling the wall down. | sensing as activity |
| He saw them pulling the wall down. | sensing as inert processing |

(2) Spatial region: material-relational:

| The troops surrounded the embassy. | space as motion |
| Trees surrounded the embassy. | space as relation |

(3) Symbolization region: verbal-relational:

| The report indicates they're intelligent. | symbolization/<br>communication |
| The report reflects their intelligence. | symbolization/identity |

(4) Semiosis region: verbal-mental:

| He convinced them they'd won. | external sensing |
| He concluded they'd won. | internal saying |

(5) Affection region: mental- relational:

| He'd like them to come. | sensing as inert process |
| He'd be pleased for them to come. | sensing as attribute |

(6) Qualitative change: material-relational:

| His grip weakened | change as event |
| His grip became weaker | change as coming to be |

(7) Representation: material-relational:

| He is standing for parliament | representation as activity |
| He stands for honesty | representation as (inert)<br>symbolization |

---

[6] To avoid clutter in the figure we have left out some clines. For instance, there is, arguably, a cline between receptive (passive) material and intensive ascriptive relational and a similar one between receptive (passive) effective mental and, again, intensive ascriptive relational.

The clines are exemplified below.[6]

| Typological oppositions | Topological parameters |
|---|---|

(1) behavioural region

(i) behavioural: material-verbal:

```
"Come here", he groaned.
"Come here", he asked.
```
saying as activity
saying as communication

(ii) behavioural: material-mental:

```
He watched them pulling the wall down.
He saw them pulling the wall down.
```
sensing as activity
sensing as inert processing

(2) Spatial region: material-relational:

```
The troops surrounded the embassy.
Trees surrounded the embassy.
```
space as motion
space as relation

(3) Symbolization region: verbal-relational:

```
The report indicates they're intelligent.

The report reflects their intelligence.
```
symbolization/ communication

symbolization/identity

(4) Semiosis region: verbal-mental:

```
He convinced them they'd won.
He concluded they'd won.
```
external sensing
internal saying

(5) Affection region: mental- relational:

```
He'd like them to come.
He'd be pleased for them to come.
```
sensing as inert process
sensing as attribute

(6) Qualitative change: material-relational:

```
His grip weakened
His grip became weaker
```
change as event
change as coming to be

(7) Representation: material-relational:

```
He is standing for parliament
He stands for honesty
```
representation as activity
representation as (inert) symbolization

---

[6] To avoid clutter in the figure we have left out some clines. For instance, there is, arguably, a cline between receptive (passive) material and intensive ascriptive relational and a similar one between receptive (passive) effective mental and, again, intensive ascriptive relational.

Having exemplified the clines in these different regions, we will now discuss the first two very briefly.

(1) There is a behavioural region, with one cline between material and verbal and another between material and mental. The behavioural processes discussed above (Section 3.2) can be seen in these terms to occupy a semantic space along two clines:

(i) a cline between material and verbal processes which we can gloss as 'saying as activity'. This would account, among other things, for the ability of behavioural processes to quote:

```
"Oh no," he cried/sobbed/wept/grumbled/grunted/murmured etc.
```

(ii) a cline between material and mental processes which can be glossed as 'sensing as activity'. This would explain the presence of embedded macro-phenomena (the act of 'them cooking dinner') in both behavioural and mental process of perception (although the behaviourals cannot project meta-phenomena: behavioural - *He is watching that they are cooking dinner* but mental - *He sees that they are cooking dinner.* ):

```
He is watching/feeling/sniffing/observing ⟦them cooking dinner⟧.
```

(2) There is a region of spatial processes, with a set of verbs that can serve either in material clauses or in relational one − *surround, stretch, run, go,* &c. These may be construed as doing/ happening − that is, as motion through space. The Medium will move along some vector, which may be specified as a Locative of direction:

```
She ran all the way to the station.
They chased her all the way to the station.
```

Alternatively, they are construed as being in space − that is, as location or extent in space. The Medium does not move along a vector; it is immobile. If there is a Locative of direction, it does not specify the destination of a journey, but rather the endpoint of something that extends in space:

```
The road ran all the way to the station.
```

While there is overlap in the sets of verbs that can serve in the material and relational contexts − verbs such as *run* − the full 'material' and 'relational' sets are quite distinct. For instance, we might also have *she jogged all the way to the station* and *the road extended all the way to the station,* but neither *she extended all the way to the station* nor *the road jogged all the way to the station.*

One of the passages from the text discussed in Halliday (1973) illustrates the potential ambivalence within the spatial region:

```
(1) He rushed to the edge of the water and came back. (2) On
either side of the open bank the bushes grew thickly in the
flood; (3) they waded out (4) until at their farthest some of
the leaves were opening under water; (5) and these bushes leaned
over.
```

The spatial processes in (1) are clearly construed as doing, with an animate and self-propelled Actor; and they are thus material. The circumstance *to the edge of the water* is thus a directional Locative. In contrast, (3) and (5) display a tension: the Medium/ Subject is inanimate and, in principle, immobile; but the verb is one of motion (3) or potentially one of motion (5) − cf. Halliday (op cit., p. 115).

The clines are not all of the same type -- some are more discreet than others, some clearly involve grammatical metaphor, and so on; but it is useful to bring them together for purposes of discussion. Sometimes transitivity has been discussed in terms of a single scale running from high transitivity to low transitivity (cf. Hopper & Thompson, 1981); but this is in fact only one type of consideration.

## 4.3 Topology across grammatical environments

The examples we have given so far have all been concerned with 'grammatical spaces' that are construed typologically by system networks within a given grammatical environment, such as the clause. For instance, the space of processes is construed in the grammatical environment of the clause. In the first instance, these environments are created, and also separated, by rank — the environment of clauses, groups & phrases (and, within these, the primary classes of nominal, verbal, etc.). The basic principle here is an experiential one: the complexity of experience is construed grammatically as composition. Thus goings-on are interpreted and represented in two steps -- as configurations of processes, participants and circumstances (clauses) and as their component parts, the processes, participants and circumstances themselves (groups & phrases). This distribution of the grammatical system into subsystems originating in different, ranked environments makes good experiential sense, most of the time. However, it has the effect of dispersing interpersonal systems of affect across these different grammatical environments. Thus, attitude is manifested in the clause as adjuncts (*unfortunately, happily* &c.) and in the nominal group as pre-modification (attitudinal epithets: *unfortunate, poor, happy* &c.). There is a sense, then, in which the same region in a topological space (e.g. affect) is 'revisited' or, manifested, in different environments in the grammar. In fact, we find this phenomenon also within the ideational metafunction as Halliday 1985: 306-7 has shown -- the 'cryptotypes' of elaboration, extension and enhancement are manifested within clause complexes, clauses, prepositional phrases, etc. (see further below, Section 5, Table 6). In a typological account, there is no relationship between these different manifestations of these regions -- precisely because the manifestations are dispersed across different environments in the grammar. All we can do at present is posit a generalized system that we 'abstract' from the specific grammatical environments in which it is manifested:[7] see Table 2.

| 'abstracted' system | system located in grammatical environment | | |
|---|---|---|---|
| | clause complex | clause : relational | prepositional phrase |
| ⊢ elaborating<br>⟶⊣ extending<br>⊢ enhancing | ⊢ elaborating<br>'i.e.'<br>⟶⊣ extending<br>'and'<br>⊢ enhancing<br>'then' &c. | ⊢ intensive<br>'be'<br>⟶⊣ possessive<br>'have'<br>⊢ circumstantial<br>'be at' &c. | ⊢ elaborating<br>'of'<br>⟶⊣ extending<br>'with'<br>⊢ enhancing<br>'at' &c. |

**Table 2:** Abstracted system and manifestations in different environments

---

[7] Alternatively, we could bring this system out diagrammatically by means of a helix, as in the conclusion of Section 2 above.

We can think of this as a projection of a general, 'fractal' principle through the grammar; the particular images projected will all be similar but there will also be differences in accordance with the different environments. For instance, in the environment of relational transitivity in the clause, elaboration, extension, and enhancement are interpreted as process that can unfold in time.

## 5. Extant topologies

As we might expect, topological work is not unknown in systemic description, although it has never been given the positive characterisation we are attempting to formulate here. Halliday's account of MODALITY and MODULATION as degrees of usuality, probability, obligation and inclination presented above is one well known example of a topological systemic description complementing a typological one. With MODALIZATION, POLARITY in propositions is used to bound the semantic space under consideration, with degree of usuality and probability defining parameters between 'it is' (yes) and 'it isn't' (no). Similarly, obligation and inclination are used as parameters grading the semantic space in proposals between 'do' and 'don't'. – See Section 3 above.

Additional examples include Halliday's earlier work (1976:212) on modality and modulation in which he draws out the parallels between the ways in which the two systems divide up a semantic space which at that time he interpreted as deriving from distinct interpersonal and ideational metafunctional sources.

[insert Table V here]

**Table 3:** MODALITY

Also in this general areas of meaning, Halliday 1985: 336 scales congruent and metaphorical realisations of MODALITY and MODULATION with respect to degree of subjectivity/objectivity:

[insert Table 10(2) here]

**Table 4:** Degrees of subjectivity/ objectivity

Halliday 1985:251 also provides an ideational example in scaling phenomena from Things (least clause-like) to Quotes (least thing-like):

[insert Table 7(16) here]

**Table 5:** From things to quotes

Far and away the most elaborated example of topological description was mentioned in Section 4.3 above; it is found on Table 9(3) on Halliday 1985:306-307 where he projects the logical parameters of elaboration, extension and enhancement and their sub-types throughout the grammar. The Table is presented as a matrix, with lines dividing the various regions into independent cells. In spite of this the cross-classification provides a feast of data for topological examination, which could proceed by challenging the boundaries around every cell and formulating graded series of examples challenging each line.

[insert Table 9(3) here]

**Table 6:** Expansion projected through grammar

## 6. Environment (con/textual ecology)

At this point it is important to stop and ask why topology happens? – or rather, why is it that typologically distinct grammatical classes adapt themselves to function in similar ways? As with sharks and dolphins, the answer of course lies in the environment. In the case of language the environment is the social semiotic in which language patterns evolve. This means that a topological perspective is an ecological one – and that in order to understand why typologies evolve in such a way that divergent meanings come to work and look alike we need to look at text in context. For it is contextualised text that drives the grammatical semogenesis that leads to the need for complementary typological and topological orientations in our descriptions.

To illustrate briefly the kind of environmental pressures we are referring to here, consider the following text (the first paragraph from *My Place* , Wheatley & Rawlins, 1987). It is the third sentence (underlined) which particularly concerns us here.

```
My name's Laura and this is my place.    I turned ten last week.
Our house is the one with the flag on the window.   Tony says it
shows we're on Aboriginal land, but I think it means the colour
of the earth, back home.   Mum and Dad live here too, and Terry
and Lorraine, and Auntie Bev, and Tony and Diane and their baby
Dean.   He's my nephew and he's so cute!  We come from Bourke,
but Dad thought there'd be more jobs in the city.
```

This sentence is a clause complex consisting of five ranking clauses. Their logical analysis is presented below :

```
   1  α    Tony says
     "β    it shows
     'γ    we're on Aboriginal land,
  +2  α    but I think
      'β    it means the colour of the earth, back home.
```

The second ranking clause, *it shows*, is a verbal process, hypotactically projecting the locution *we're on Aboriginal land;* it could have a Receiver (*it shows us*). The final clause on the other hand, *it means the colour of the earth, back home,* is a relational identifying process - a Token (*it* ) ^ Process (*means* ) ^ Value (*the colour of the earth, back home* ) structure with which the symbolic significance of the Aboriginal flag is construed. Note however that both clauses are concerned with the meaning of the flag: *it shows* explores its significance verbally, while *it means* explores it relationally:

|  | 'signifier' |  | 'signified' |
|---|---|---|---|
| COMMUNICATION | it (the flag) | shows | we're on Aboriginal land |
| IDENTITY | it (the flag) | means | the colour of the earth, back home |

This is in fact the 'symbolization as communication/symbolization as identity' topological parameter noted in Section 4.2 above. And the text illustrates the way in which the verbal and relational poles of this parameter can be marshalled textually to do closely related work. Indeed, this is just the type of example that makes typological analysis difficult – context so powerfully construes the different structures as the same that it hard (especially for apprentices) to see that grammatically how they are distinct.

There are plenty of other examples of this kind in the literature which demonstrate the kinds of con/textual pressures under which grammar works. We will look at just three ideational examples here.

One well documented area has to do with the semantic space surrounding the notions of AGENCY. Trew's 1979 work on ideology and newspaper reporting show the ways in which responsibility is mediated by a number of grammatical systems. The most obvious system to consider is of course TRANSITIVITY. Middle clauses consist simply of a Medium and Process (with no implication of an Agent); and with effectives, we have a choice between thematizing the Agent (operative) or not (receptive) and if not thematized then the option of not realising the Agent at all is made available:

middle                                   `The blacks died.`
effective:   operative                      `The police shot them.`
           receptive:    agentive       `They were shot by the`
                                        `police.`
                        non-agentive     `They were shot.`

But beyond this, MOOD is also implicated since non-finite clauses also provide the option of not realising the Agent (in embedded clauses):

non-finite: embedded             <u>`Shooting the blacks`</u>` was untimely.`

Nominalisation provides another opportunity for suppressing Agents, at the same time as the process itself is reformulated as a kind of thing:

nominalisation:                  <u>`Their elimination`</u>` was unfortunate.`

The significant point here is that the options associated with voice, finiteness and nominalisation arise in divergent parts of the grammar; but as far as agency is considered, they can all be used for closely related effects.

Earlier we discussed two topological parameters relating material and relational processes: representation (as activity or as symbolic relation) and space (as being, i.e. location, or as doing, i.e. motion). Another parameter in this area was noted by Eggins, Wignell and Martin 1987 in their work on the discourse of history. They noted the tendency for history to nominalise activities as Existents in relational processes and then to code these nominalisations as Mediums in material processes constructing a life cycle:

[relational: activity as Existent]

> `In this respect, too, there was `<u>`a turning away from mediaeval`</u>
> <u>`interests`</u>`.`

[material: activity as Medium]

> `Most historians, however, agree that `<u>`fundamental changes marking`</u>
> <u>`the beginning of the modern world`</u>` took place during the`
> `fifteenth century.`

Here is an extended passage from their study, showing the life cycle metaphor constructed by the material coding in full swing.

> `Why did this renaissance `<u>`develop`</u>`? Why did it `<u>`start`</u>` in Italy?`
> `How did it `<u>`spread`</u>` to the rest of Europe? What new contributions`
> `did it add to the growth of mankind? When did it `<u>`come to a`</u>

<u>close</u> and why? These are some of the questions to be answered in this chapter.

Here again we see a particular discourse pushing different areas of the grammar to do similar work, with nominalisation feeding the complementary Existent and Medium roles.

In related research into the discourse of geography, the same researchers explored the processes by which technical terms are created and defining. Wignell, Martin & Eggins 1987/1990 note that elaboration at word and group ranks and identification at clause rank are all integral to the process of definition (cf. Halliday's Table 9(3) reproduced as Table 6 above).

word complex:                         protozoa        (single-celled animals)
                                          1                      =2

group complex:                     the final level    (trophic level 3)
                                            1                      =2

relational identifying clause:     they    are called    converters
                                       Token    Process       Value

The co-operation between these different areas of the grammar is illustrated in the following text ('elaborations' are underlined):

...At <u>the next level (trophic level 2)</u> animals eat <u>these plants (herbivores)</u> or eat <u>other animals (carnivores)</u>; <u>these animals are the **consumers** of the ecosystem.</u> At <u>the final level (trophic level 3)</u> bacteria, fungi and certain <u>protozoa (single-celled animals)</u> break down dead animals and plants as well as the waste products of the consumers. These they convert into useful elements which are taken up once more by the roots of plants and so <u>they are called **converters.**</u>

To date, there appears to be no systemic documentation, either phylogenetically or ontogenetically, of the ways in which contextual pressures of this kind brings pressures to bear on the grammar which force it to elaborate its options in ways that divergent choices come to resemble each other. But this is obviously a rich and exciting frontier for systemic description which will bear critically on our current rather limited understanding of semogenesis.

## 7. Implications

We began by surveying the typological resources of systemic theory; in particular, we tried to show how they are 'multidimensional' because of stratification, simultaneous metafunctions, and so on. We then suggested that there are still paradigmatic relations that are hard to capture and turned to a topological perspective as a complement. In opening up a new descriptive frontier of this kind, it is hard to avoid a higher proportion of queries than insights. Nevertheless, there are a number of implications associated with proposing complementary typological and topological orientations which we will briefly review here.

(i) One thing we have noted in our teaching of the grammar is than grammar learners are born topologists. A very high proportion of the 'mistakes' in student analyses of text have to do with their tendency to background the criteria motivating particular classifications and foregrounding alternative criteria which would tend to ground a complementary topological perspective. This is even more true where texts push different areas of the grammar in similar ways such as those illustrated in Section 6 above. This makes student

assignments a fertile ground for topological enquiry, the results of which can be used to alleviate some of the frustration they feel when being down-graded by narrow minded typologists such as ourselves.

(ii) Another way in which topological work should prove useful has to do with resolving tensions about which criteria to use as point of departure in system networks. Any practicing systemicist will be familiar with the problems when writing a system network of knowing where to start, which problem always resolves itself when made explicit into the issue of which criteria to deploy at primary, which at secondary delicacy and so on. Given typology and topology as complementary descriptive strategies, resources are provided which make it possible found networks on certain criteria and use others to establish parameters within some relevant semantic space that might otherwise be obscured.

(iii) Topological considerations are also highly relevant to argumentation and debate. As more than one systemicist has complained (e.g. Berry, 1989), argumentation among systemicists often suffers from the lack of explicit attention paid to criteria for motivating typological descriptions; distributing criteria across typological and topological perspectives should encourage systemicists to make their criteria clear. Beyond this, systemic descriptions are often criticised uninsightfully on topological grounds. The argument runs along the lines of "I can see a dimension of agnation other than yours (which I actually can't see); therefore you are wrong." Huddleston's 1988 review of Halliday 1985 is full of argumentation of this kind -- e.g. his critique of Halliday's analysis of clauses such as *after they had debated for an hour* in *after they had debated for an hour they shook hands* as hypotactically dependent clauses in a clause complex instead of as clauses embedded in other clause. Huddleston wants to capture the agnation between *after they had debated they shook hands* and *after the debate they shook hands;* but he says nothing about the agnation (captured in Halliday's analysis) between *after they had debated for an hour they shook hands* and *they debated for an hour, then they shook hands.*

(iv) We have considered topological parameters within the framework of a single language, English. But topological considerations may prove even more useful in work on language typology, which has long been troubled by the problem of looking for categories (i.e. typologically defined classes) in languages (and usually finding them; see Martin 1983 for a discussion of this problem). A topological perspectives would allow us to design parameters for comparison within various kinds of semantic space. And topological parameters in one language might resolve into typological patterns in another. Recall for example the discussion of the symbolization parameter connecting verbal and relational processes in Section 3 above. In Tagalog, the normal way to quote is not in fact to project as in English, but rather to establish a Token-Value relation between a locution and a nominalised verbal process. Our topological perspective on English TRANSITIVITY tells us in effect not to be surprised.

| "Tapos | na | ", | ang | sagot | niya. |
|--------|------|-----|-----|--------|-------|
| finished | fruition | | TM | answer | s/he |
| Token | | | Value | | |
| "It's over now" | | | her answer | | |

"It's over now", she said.

(v) The question of ontogeny and phylogenesis has already been raised above. Let us simply mention here an example, noted by Halliday 1985:128 in his discussion of behavioural processes. He notes there that behavioural processes in English used 'present' rather than 'present in present' tense to construct ongoing action and that because of this we still find some alternations such as *Why do you laugh?* alongside *Why are you laughing?* One may say in this context that behaviourals are drifting in the direction of material

processes along the topological parameter we established in Section 3. Indeed, it may only be in modern English that the tension we considered would arise. The way TENSE used to work we might well have classified behaviourals with mentals and verbals (probably not representing them as a distinct class at all). Putting this boldly, we could claim that semogenesis proceeds along topological parameters, and that certain kinds of change may mean that we need to reconsider our typological description from time to time.

(vi) Finally we should mention Lemke's own suggestion concerning the relevance of topological perspectives to language learning. Lemke points out that taking topological relations between genres into account allows us to plan teaching programs in which we are clear about the ways in which teaching one genre might provide a good basis for moving onto another topologically related one. Similarly in grammar teaching, a topological perspective should make it easier to make explicit the connections between systemic grammatical descriptions and the kind of learner oriented grammars envisioned by proponents of the functional notional syllabus (e.g. Wilkins 1976). At present systemic grammars differentiate notions and functions that may need to be brought together for ESL/EFT purposes.

Our hope is that by pursuing work along a number of these lines of enquiry we can formulate our characterisation of topological analysis in more positive terms. This will mean devising suitable forms of representation, organised around metaphors of space and working out procedures for motivating parameters and bounding relevant types of semiotic space. In the short term we need to work hard on improving our understanding of the complementary relationship between typological and topological orientations so that as systemic linguists we have a a stronger grip on how making typology the centerpiece of our theory and descriptions selects or foregrounds certain parameters in a system and leaves others more implicit.

In conclusion, let us just note that just as we have examined paradigmatic organization in terms of topology, we can also explore syntagmatic organization along similar lines. For instance, the experiential constituent structure of the clause says there is a process element, one or more participants, and possibly also circumstances. From a topological point of view, the process and the medium are most closely associated (Halliday, 1985) — they form the core or nucleus — whereas other participants and circumstances are less closely associated.

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