December 4, 2024

Notes for Week 12

Cutting Even Finer than Substitution: Token-Recurrence Structures

Outline:

I. What are token-recurrence structures (TRS)? The paradigm of cotypicality.
II. Token-reflexive uses require a further, different kind of TRS: anaphora.
III. Two kinds of token-recurrence structure compared.
IV. Logical Explicitation of Anaphoric Relations.
V. Conclusion 1: Weeks 1 through 7.
VI. Conclusion 2: Weeks 8 through 12.
VII. Concluding Observation and Question.

Introduction:

We saw last time that we can understand semantically significant subsentential structure as consisting of *features* of sentential sign designs, rather than *parts* of those sign designs. By "features" here I mean properties of the sign designs that consist in their *relations* to *other* sentential sign designs. In this sense, the semantically significant subsentential features can be thought of as *patterns* exhibited by sentential sign designs.

Those semantically significant features or patterns exhibited by sentential sign designs are abstracted by using **the Bolzano-Frege-Quine method of *noting semantic invariance* under *substitution***. In Meeting 10 we saw how to use that substitutional method to discern the occurrence of singular terms and predicates—in particular, *complex* predicates. We saw that complex predicates are *features* of or patterns exhibited by sentences even when singular terms and *simple* predicates are literal *parts* of the sentential sign designs. We also considered a powerful transcendental expressive argument for the necessity of substitutionally discerned subsentential features exhibiting the familiar term/predicate structure.

In meeting 11 we considered a possible *functional* characterization of substitutional relations among sentences, aiming at a fully general top-down characterization of the crucial concept of one sentence being a *substitutional variant* of another, and the use of that notion to discern the occurrence of singular terms and complex predicates in sentences.

I want now to consider the **presuppositions** of using *substitutional* relations among sentences to identify semantically significant subsentential features. This inquiry is orthogonal to the functional characterization of substitution I was after last time.

The notion of substitution analyzed in the WASTWATA argument from *MIE* depends on two sorts of primitive sign designs: the sentential sign designs that are substituted *in* and the subsentential signs (singular terms) that are substituted *for*.

The key observation I want to start from here is that both the sentences and the terms must be construed as *repeatable* expression kinds in order to be intelligible as underwriting *substitution*. The *same* substituted *in* sentential sign design must be discriminable as having *different* substituted *for* expressions substituted in it, and the *same* substituted *for* expression must be discriminable as capable of being substituted *in* different sentences. We can plug different singular terms into the same sentence, to get different further sentences, and the same singular term must be identifiable as occurring in different sentences. These are rock-bottom presuppositions of the substitutional methodology. The current concern is with the nature of this *repeatability*: paradigmatically the capacity to recognize two sentences as having occurrences of the *same* singular term. (The case we address directly is terms, since it makes the most direct contact with the literature on singular-term usage. Corresponding considerations do apply to the repeatability of substituted *in*s.)

More specifically, substitution inferences, or more carefully, substitution implications (including incompatibilities) are where the premise and conclusion either:

a) Have the *same* substituted *for*, with different substituted *in*s: Pa|~Qa, or
b) Have the *same* substituted *in*, with different substituted *for*s: Pa|~Pb.

The question we are asking is how to understand "same" here. It cannot mean "same token(ing)," since that is patently not true in these cases. It *can* mean: "are of the same lexical-syntactic *type*." But that is *not* the only way the tokenings can be related in order to support substitution implications/incompatibilities. (It is enough if the tokenings are members of the same anaphoric tree.) Is there any third alternative?

What ties together the two occurrences of the term 'a' in sentences of the form 'Pa' and 'Qa'? They are tokens of the same type. We want to understand the *role* that fact—that the two tokens are of the same lexical-syntactic type—is playing in the discerning substitution-inferential relations among sentences. Here we are looking both at the 'Pa' to 'Qa' ('Thera walks,' to 'Thera moves,') and from 'Pa' to 'Pb' ('Benjamin Franklin was the first Postmaster General,' to 'The inventor of bifocals was the first Postmaster General,'). We want a more abstract, functional characterization of the *work* that is being done, in identifying substitutional relations among sentences, by the cotypicality of tokens that occur in sentential sign designs. For it is only if we have such a characterization that we can consider whether that same job might be done differently: by some other mechanism.

Generically, we are talking about ways of tying unrepeatable tokenings together, into classes that function, with respect to substitutional relations, as the cotypicality of those

tokenings does in serving to re-identify repeatable substituted *for*s and substituted *in*s. I will call these "**token-recurrence structures**."

Think about what would be required to deny self-identity: to say a≠a. Does the cotypicality of tokenings guarantee the metaphysical self-identity of objects? Or is the latter a misleading reflection of the former?

I might offer, as an aside, a sociological observation about contemporary philosophy. The concept of substitution, which I have argued is at the core of the *concept* of semantically significant subsentential structure, has been little attended-to by philosophers of language. The work on that concept has principally been done by logicians. (I think of van Fraassen as wearing both hats in his essay.) And the logicians have been focused on artificial, logistical languages, whose principled avoidance of *token-reflexive* expressions has made it largely unnecessary to worry about this aspect of the presuppositions of using a substitutional methodology to assimilate sentential sign designs. There is a topic for systematic study here, but it has not been pursued as such. The relevant considerations have been raised, but only as they come up in the context of other, apparently unrelated projects. I have in mind here theories, largely downstream from Kripke's pathbreaking "Naming and Necessity," relating the *use* of expressions such as proper names to the semantic assignment of *referents* to them. It turns out that this sort of investigation of the relations between what can be said in a *pragmatic* metavocabulary about the *use* of proper names and what can be said in a representational *semantic* metavocabulary (I include the qualifier "representational" because other sorts of semantic MVs are possible: in particular, implication-space semantics.) must in effect address the question of token-recurrence structures. But contingent limitations of the way the issue arises in that setting made it hard for people to think systematically about the more general issue of token-recurrence structures. As far as I know, the discussion in *MIE* is still the only one to address that issue.

We have seen that the key to understanding semantically significant subsentential structure is *substitution*. And we have emphasized that notion invariance w/res to reason relations, under substitution requires that *different* expressions can occur "in the same place". We have not emphasized the other side of that coin: that the *same* expression must be able to occur in *multiple* "places". Here "place" is metaphorical for the sort of functional role w/res to substitution that we were trying to specify in mathematically tractable detail last week.
That notion of the *same* expression occurring in *different* sentences is to be understood functionally, in terms of what difference it makes (difference to what?) whether it is the same or different expression occurring in the two sentences.
This is the origin of what we will call "token-recurrence structures".

I. **Token recurrence structure and cotypicality**.

1. Pa and a=b, so Pb.

What is the connection between the two tokens of type <a> in (1)?
Schröder's Axiom: All tokens of the same type are coreferential throughout.
Belnap: Are the other axioms *independent* of that one?
Along with using '<a>' to refer to the type of the bracketed expression, can use '/a/$_1$' and '/a/$_2$' to refer to the two tokens in (1), and might indicate their relation by

2. /a/$_1$≈ /a/$_2$.

But now what is the relation between the two 'a's in *this* sentence?
Token-recurrence is a relation among token(ing)s that is

i) Presupposed by substitutional reason relations, and
ii) Stronger than coreference.

(ii) holds because you cannot deny token-recurrence by denying any sort of identity, since every attempt to do so presupposes some recurrence structure. So

iii) Token-recurrence is an *implicit* structure that cannot be replaced by *explicit* identities.

Argument that some sort of token-recurrence structure must be implicit in practice, rather than imposed by rules: by analogy to Lewis Caroll. Make explicit using /A/$_i$ notation, and can use a '≈' with that. But what if we ask what connects the two tokens of type <A> that occur inside the tokening notation? We could introduce *another* locution to make explicit the relations between *these* tokenings. But clearly we are embarked on a potential regress. Conclusion: at some point, one needs to rely on a *practical*, so *implicit*, token-recurrence structure.

3. The paradigmatic token-recurrence structure is that exhibited by what Russell called "logically proper names": expression-*types* all the *token*(ing)s of which are logically or grammatically guaranteed to be *coreferential* (hence intersubstitutable *salva veritate*).
Q: Are there any?
A: Only by explicit stipulation (presupposing implicit practice).

II. **Anaphoric token-recurrence structures**.

1. There are also (what Reichenbach called) *token-reflexive* expressions, such as 'I', 'here', 'this', and 'it'. Cotypical tokenings of these types are not even guaranteed to corefer, never mind to stand in the even tighter relations that tokenings of logically proper names stand in to one another.

Logicians, who do think about substitution (*Principia Mathematica* notoriously did not get its substitution rules right) do not think about token reflexive expressions. (Frege did.). And so, they do not think about the presuppositions of substitution, in the way I am recommending.

2. Indexicals:

Tokenings have *indices* associated with them, specifiable in advance: speaker, place of utterance, time of utterance, perhaps actual world (Lewis). Compute their referents (class of expressions intersubstitutable saving some semantic invariant) from their indices. Note that in addition to simple indexicals like 'I' there are complex ones, such as "my mother's favorite color."

3. Demonstratives and pronouns:

a) Demonstratives such as 'this' or 'that dog' are not indexicals. If they were, the relevant index would be a 'demonstration' accompanying the demonstrative tokening. But there is no class of features of demonstrative tokenings, specifiable in advance of figuring out their referents, that determine those referents. For *any* feature, there are some circumstances in which that is just what is needed to settle the reference. Settling the referent and specifying the 'demonstration' that secured it are two ways of describing the same task.

b) Where there is a literal pointing (LW: "Did you point at the plate? Its shape? Its color?..."), one need not be in a position to repeat it coreferentially: "Look at that rabbit run into the burrow!" If the *unrepeatable tokening* /that rabbit/$_1$ is to be semantically significant, it must possible to take it up somehow as determining something that *is* repeatable as something that can serve as a reason from which to draw conclusions, and that can itself be challenged. "I don't think *it* was a rabbit, *it* ran more like a cat." We do that by using *pronouns*, whose antecedents are the original unrepeatable demonstrative tokenings. The first <it>, /it/$_1$, is anaphorically dependent on /that rabbit/$_1$, as its anaphoric antecedent. The original demonstrative tokening intiates an indefinitely continuable *anaphoric chain*, that can include not only the second pronoun-tokening /it/$_2$, but further continuations.

Chastain:

"*A Republican Senator* introduced this authoritarian bill."

"*He* will not get any support on the other side of the aisle."

"*The Republican Senator* later withdrew the bill."

What is token-recurrence?
It is a relation among token(ing)s that is

i. **stronger than coreference, in that you cannot deny it by denying an identity, because every attempt to do so presupposes some token recurrence structure**. (Important argument. It is an expressivist point. What is explicit, in identities serving as intersubstitution licenses, rests on *implicit practices.*)
ii. Presupposed by substitution inferences.
iii. As a presupposition of expression of reason relations, Pa so Qa (but now does it help to say 'a=a'? What establishes the identity here? Could one deny the identity? How? Schröder's try), it is, we are tempted to say, *a priori*. This is not quite right. But it is to be established antecedently to and independently of empirical questions about contingent states of affairs (so, in that sense, *synthetic*).

Must have a way to *take up* unrepeatable utterances ('that rabbit') and use them to draw conclusions. Taking them up in this sense is putting them in conceptual shape, that is, making them semantically significant and conceptually contentful by making them available for *inference*, to serve and stand in need of reasons.

For that, one needs a token-recurrence structure. Some other tokenings must *inherit* their status (which we have so far not further specified) from the unrepeatable originals.

We call this structure of token-recurrence *anaphora*. There are tokenings playing the functional role of anaphoric *initiators*, and tokenings playing the functional role of anaphoric *dependents*. The paradigm of anaphoric dependent constructions is *pronouns*. The initiators are the anaphoric *antecedents* of the pronouns.

Note that *some* uses—maybe most—of "demonstrative" types like 'this' and 'that' are actually anaphoric. "That senator…" picking up an earlier "The lone negative vote was from a Senator with a safe Republican seat. That senator *always* votes 'No'."
Anaphoric *chains*—really, trees.

We look to substitution inferences (implications/incompatibilities), which require recurrence. The *MIE* view is that what *recurs* is the substitution-inferential commitments: what anaphoric connection (as token-recurrence) guarantees is that the two linked tokenings will be governed by the *same* substitution-inferential commitments, paradigmatically identity claims. (There might be different views about what the governing substitution-inferential commitments are, between speakers and assessors, but an anaphoric connection guarantees that whichever ones are relevant are the *same* for the two tokenings.)

c) Here is the skeleton of a transcendental deduction of the necessity of a *different* sort of token-recurrence structure: anaphora:
    - Deixis presupposes anaphora.
    - Empirical discourse, so any autonomous discursive practice (ADP), must include deictic (demonstrative) expression-uses.

Deixis presupposes anaphora:

For *unrepeatable* acts, events, and episodes to get taken up in *conceptual* form, that is, so as to be significant for *inference* (giving reasons for and against, normatively governed by reason relations), they have to initiate *repeatable* chains or trees.

Deixis presupposes anaphora.

These are *non*symmetric, indeed almost always *a*symmetric *token recurrence structures*.

III. **Two kinds of token-recurrence structure compared**.

How fundamental is the type/token distinction? Could there be a language without it?
Asymmetric token-recurrence structures (anaphoric chains) are necessary in any ADP.
As testified both by the philosophical history and by regimentation practices, symmetric, cotypicality equivalence classes of tokenings are more basic along an important dimension.
Is there also a dimension along which anaphoric links among tokenings are more basic than sorting them by lexical types? Yes.

1. Anaphora and the social division of ignorance:

Anaphoric chains are specified in a *pragmatic* MV. Using and attributing anaphoric inheritance is something we *do*. It lets us *talk without knowing what we are talking about,* outsourcing that referential commitment to others, from whom the user of an anaphoric dependent inherits it.

S: "…and at that point, the guy totally lost it and took a swing at the cop."
S': "I'll bet *he* spent the night in jail."

Anaphora as giving us the crucial expressive power to make determinately contentful claims without knowing what we are talking about.

2. Modal rigidity:

Kripke identifies proper names (and demonstratives) as *modally rigid*: picking out the same thing in all possible worlds. After all, while it *could* have been the case that

a) Benjamin Franklin is not the inventor of bifocals,

it could *not* have been the case that

b) Benjamin Franklin is not Benjamin Franklin.

But it is also *not* possible that

c) Benjamin Franklin is not the inventor of bifocals, and *he* is not Benjamin Franklin.

The in-effect *stipulated* coreference of anaphoric dependents with their antecedents is expressively essential to the capacity to reason subjunctively.

d) This very teapot might not have been here for me to point to, but *it* would still have been a teapot.

Kripke's discovery paraphrased:
In these modal contexts, proper names act anaphorically, like pronouns: "modal rigidity."
That is the basis of the "causal-historical theory of proper-name usage."
We have seen that propositional contents can be understood in terms of the ranges of subjunctive robustness of implications.
We must express (and so understand) the links between sentences in such reasoning as exhibiting an *anaphoric* token-recurrence structure, even when that structure is *marked* by cotypicality.
We understand all this as anaphoric dependence, with metaphorical talk of "baptism" standing in for the functional role of anaphoric initiator, and the "causal links" (SK preferred "historical") from usage to usage being anaphoric dependence.

The difference between modally 'rigid' and modally variable expressions can be understood entirely in terms of the rules (norms) governing anaphoric dependents. If something in the world is to be thought to be *represented* by uses that *express* this practical difference, a big story will need to be told about why and how.
Though I have only pointed to considerations favoring both this account of modal rigidity and the anti-metaphysical conclusion I am inclined to draw here (no *semantic* argument for *substances* or *essences* based on modal rigidity of proper names and (as they put it) demonstratives (even though it is the pronouns anaphorically dependent on them that are actually used in examples), the argument I am gesturing at is an instance of a more general one.

Claim: The anaphoric account of modal rigidity, which understands the rigidity of proper names on the model of the behavior of anaphoric pronouns in subjunctive contexts, which is in turn understood in terms of the functional idea of (asymmetric) token-recurrence structures, can be understood methodologically as belonging on the "*subject* naturalism" side of Huw Price's distinction between subject and object naturalism—when we divide through by the naturalism.

Object naturalists insist that one must be able to use such a vocabulary to understand what one is talking or thinking *about*, what the *referents*, or *truth-makers* (David Armstrong, upstream of the Canberra planners, before Kit Fine). This is a representational *semantic* MV. *Subject* naturalism looks to use that kind of vocabulary as a ***pragmatic* MV**. Price insightfully reads the later Wittgenstein as a ***subject naturalist.*** A paradigmatic such move is to urge us not to worry about what kind of thing numbers are (are they located in space and time?), so long as we are not puzzled about how children learn to count, add, and multiply. The aim is to make a move like this about modal rigidity, via the notion of anaphora.
"Dividing through by the naturalism" is ignoring this restriction of vocabulary, leaving the opposition between an account in a *pragmatic* metavocabulary specifying what practitioners *do*, and an account in a representational semantic metavocabulary that explains features of practice by appeal to the metaphysics of what practitioners are talking *about*. Subject naturalism, when we divide through by the naturalism (as at least a separable commitment) is operating at the level of *pragmatic* MVs.

Conclusion: *actual* proper name usage is properly understood as anaphoric, in the functional sense of exhibiting an *asymmetric* token recurrence structure. In natural language, there *are* no "logically proper names", in the sense of types all of whose tokenings are guaranteed to be coreferential, i.e. intersubstitutable. The concept is coherent and intelligible, and we can achieve it in artificial vocabularies (though *not, contra* Schröder, in an *axiom*) or *regimented* forms of natural language (by stipulation in a suitably expressively powerful MV). Outside of regimentation, cotypicality is just a rough, fallible guide to token recurrence, a handy marker that sometimes misleads (Aristotle cases). It is heuristic.
So if we can do with just one token recurrence structure, it wd have to be nonsymmetric. Q: Is there an argument that there must also be some symmetric, so equivalence class notion? A: Yes,

but in a sense, trivially. Because we use the asymmetric one in an ancestral plus way, to define an equivalence class of tokenings. The equivalence class is all the tokenings that are elements of the same anaphoric tree, that is are on *some* anaphoric chain anchored in a common anaphoric antecedent or initiator.
That is what we need, functionally, for semantic significance in the sense of mattering for substitution implications. It is just that instead of that equivalence class being defined, as it were, immediately, by lexical type, it is determined from a tree, so there is structure beyond that of the resulting equivalence relation.

3. The arc of our story has been from understanding symmetric, cotypicality equivalence-classes of tokenings, to seeing this as one species of the genus *token-recurrence structure*. Asymmetric anaphoric chains and trees of tokenings are another. We next observed the ubiquity of anaphoric token-recurrence structures: The modally rigid use of expressions like proper names turns out to be governed by and explicable in terms of anaphoric token-recurrence structures. Does this mean that cotypicality is a ladder that can be discarded once ascended? Can we dispense *entirely* with cotypicality? Is marking ultimately anaphoric structures of tokenings by making them share a type a mere heuristic or psychological convenience?

IV. **Logical Explicitation of Anaphoric Relations**:

1. Q: If we introduced *logical* locutions, to make *anaphoric* relations explicit—as identity locutions and quantifiers make substitutional relations explicit and conditionals and negation make reason relations of implication and incompatibility explicit, what would they look like?
A: Anaphorically indirect definite descriptions. (Cf. *MIE*, second half of Chapter 5.)

We have suggested ways of making anaphoric relations explicit in a *meta*vocabulary. I can say something like

/a/$_i$, /a/$_j$∈<a> and /a/$_i$ < /a/$_j$, where '<' is marking anaphoric dependence.

But *logical* locutions are to provide this metalinguistic expressive power *in an extension of the object language*.
So we are looking for locutions that give us the expressive power to *say that* one tokening is anaphorically dependent on another *in* (an extension of) *the object language*.
Q: How can one tokening explicitly acknowledge its anaphoric dependence on another?
A: It must include some specification of the antecedent tokening, as well as some conventional method for producing a *type all* the tokenings of which are anaphorically dependent on that antecedent tokening.

In "Reference Explained Away" I deduce the functional constraints on such a locution. In particular, it must be that if the locution is <T(/a/$_i$)>, a type all the tokenings of which are guaranteed to be coreferential with, because anaphorically dependent on, the antecedent tokening /a/$_i$, then so must all the tokenings of type <T(T(/a/$_i$))>, and also for further iterations. The T-locution must be *idempotent*.

I then look for locutions in ordinary language that perform this anaphor-forming operation, subject to that idempotence constraint.

To see what these locutions are, consider this dialogue:

S: "Don't rely on Binkley as an auto mechanic. That airhead misadjusted the valves on my car."

A: "I disagree. <u>The one S referred to as 'that airhead'</u> is actually a pretty good mechanic."

A has secured that he, like S, is talking about Binkley. He has done that by picking out an utterance of S's, a tokening of type <that airhead>, and used a device that ensures he is coreferring with that tokening, and so referring to Binkley.

And this device iterates (is idempotent):

A': <u>The one A refers to (calls, describes) as "the one S refers to as 'the one A refers to as 'that airhead''</u> only pretends to know about cars.

The underlined phrase still refers to Binkley, even if A and A' only heard the second sentence of S, and so don't *know* that they are talking about Binkley.

Conclusion: the principle expressive role characteristic of 'refers' (and its cognates) **in natural languages is as a pronoun-forming operator.**

What one is *doing* in *using* 'refers' is forming anaphoric pronouns.

So we have four accounts of what one is *doing* in using representational locutions such as 'refers':

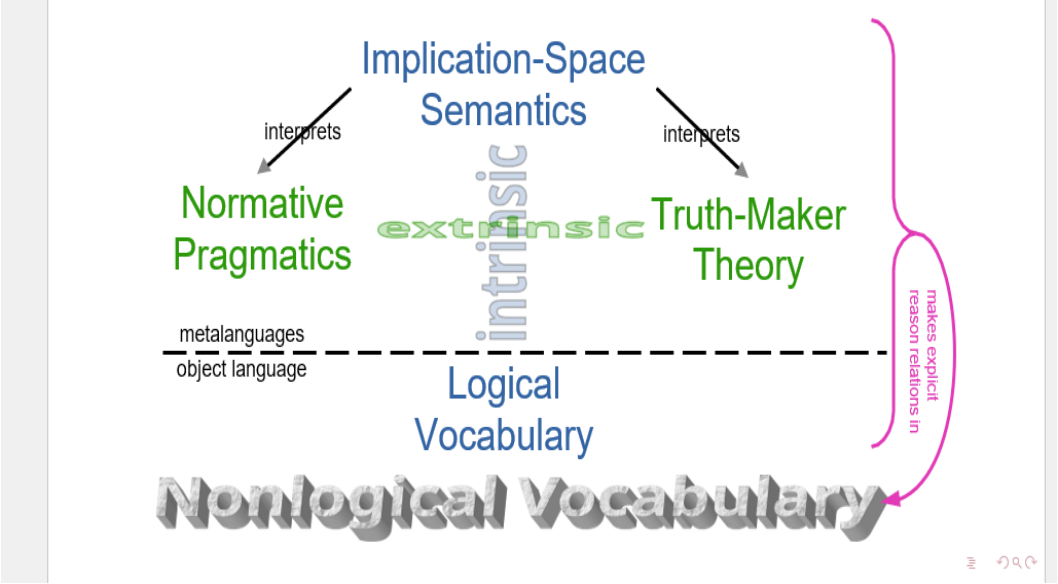
i) social, as in de re ascriptions,
ii) historical-recollective,
iii) normative governance and subjunctive tracking,
iv) anaphoric.

Hint: (ii) and (iv) go together, in their *a*symmetric, historical structure.

And (i) and (iv) are manifestations of the same phenomenon: interpersonal anaphora is expressed explicitly in ascriptions with *intrasentential* anaphora relating what is in the *de re* scope of the ascription and what is in the *de dicto* scope: A: "S believes *of t* that Φ of *it*," where S: Φ(*t'*), and A can pick that tokening *t'* up anaphorically as 'it', for instance, to respond A: No, Ψ(it).

V. **Conclusion of Part I. Weeks 1-7**:

The first segment of the course was devoted to *declarative sentences*: their pragmatics, representational semantics, logic, and implicational semantics. See *RLLR* Ch. 6.
Ulf's diagram:



VI. **Conclusion of Part II. Weeks 8-12**:

Weeks 8-12 have been delving below this sentential-inferential-propositional structure, to look at further pragmatic dimensions of sentence-use, as well as at semantically significant subsentential structure.
We have considered the following dimensions:

a) Social,
b) Historical,
c) Empirical (noninferential)
d) Term/predicate I. Presupposing substitution.
e) Term/predicate II. Functionally defining substitution.
f) Incorporating unrepeatable events in conceptual, repeatable form: anaphora and token-recurrence structures.

Note: These last include all three of the principal (in fact orthogonal) dimensions that Kant runs together (with methodological malice aforethought) in the *concept/intuition* distinction:
i) *General/particular*, identified with predicate/singular term, (cf. (d) and (e))
ii) *Active/passive*, identified as inferential/noninferential, which we discussed as (c), empirical, with normative governance and subjunctive tracking.
iii) *Repeatable/unrepeatable* (cf. (f)).
The (a) and (b) dimensions of representational content Kant does not discuss (Hegel does).

VII. **Concluding Observation and Question**:

[This is only part of "that far-off, divine event, towards which the whole Creation moves"—even if "the whole Creation" is properly understood as contextually restricted to this course.]

Observation:
We have followed *MIE* in discerning three progressively more refined levels of semantically significant structure: *inference*, *substitution*, and *anaphora* (ISA). These articulate the use of *sentences*, *terms* and complex *predicates*, and unrepeatable, *token-reflexive* uses, paradigmatically demonstratives along with the *anaphoric* uptake of those uses.
Each level of structure turns out to exhibit a fundamental complementarity of a *symmetric* component and a *non*symmetric component:

a) **Reason relations** governing the use of sentences: *symmetric* incompatibility relations and *non*symmetric implication relations.
b) **Substitution-inferential significances** of semantically significant subsentential structures: *symmetric* for singular terms (codified logically by identity claims, creating equivalence classes) and *non*symmetric for complex predicates (codified logically by quantified conditionals).
c) Token recurrence structures: *symmetric* cotypicality equivalence classes and *non*symmetric anaphoric chains (trees) of dependent tokenings.

Question: Why, whence, and wherefore this common discursive metastructure at all three levels of the ISA dissection of dimensions of semantic structure?

Some options (in descending order of suggestiveness and significance):
Is it specific to and distinctive of *discursive* structures?
Is it a superficial *mathematical* consequence of the tasks being undertaken?
Is it a merely *psychological* result of only having available an impoverished formal toolkit? ("To one who only has a hammer, the whole world looks like a nail.")
Is it wholly *trivial* and on the surface, since the distinctions in each case turn out to be quite different and unrelated?