Philosophical Background of Syntax

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The Core Problem of Syntax

- Unified meaning of compound expressions: what it is and how it can be obtained (*productivity*)
  - How to distinguish well-formed expressions from ill-formed ones
  - How to obtain compound meaning from atomic meanings (*compositionality*)
  - How to distinguish a unified proposition from mere list of terms

    „A problem" for a language: develop relevant mechanisms
    A problem for theoretician: identify and explain these mechanisms

Strawson: Observation One

- Subject and predicate are not categories of expressions but rather **syntactic roles:**

  It should be clear that the distinction I am trying to draw is primarily one between different **roles** or parts that expressions may play in language, and not primarily between different groups of expressions; for some expressions may appear in either role (*On Referring*)

  We may speak of 'designators' or 'definite singular terms' or 'names' or 'logical-subject-expressions' or 'subject-terms' on the one hand; of 'predicate-expressions' or 'predicate-terms' on the other. I shall often speak simply of *subjects* and *predicates*, treating these titles as correlative, as **standing for expressions-in-a-role** (*Subject and Predicate in Logic and Grammar*)

Strawson: Observation Two

- Explanation for the distinction of subject and predicate must be in a sense **transcendental:**

  We assume that the subject-predicate duality [...] reflects some fundamental features of our thought about the world (1974:11)

  We are dealing here with something that conditions our whole way of talking and thinking, and it is for this reason that we feel it to be non-contingent (1959:29)

Strawson: Attempts on Solution
Individuals (1959)

- The criterion for subject-predicate distinction is an ontological distinction of object and concept:
  - Subject = expression playing the role of identifying the object
  - Predicate = expression plaing the role of identifying the concept
  - Hierarchy of types for some more general cases
- Drawbacks:
  - Identifications may go wrong (e.g. when there is no relevant object at all) and if they constitute the grammatical structure, such errors should affect grammaticality of the sentence. Actually, grammaticality is not affected in such cases, therefore identifications do not consitute grammatical structure.
    - Strawson says: problems with identifications would affect truth value of the sentence; that is too modest.
  - Strawson' s first criterion gives no plausible explanation of the unity of proposition

Strawson: Attempts on Solution

Subject and Predicate in Logic and Grammar (1974)

- Substantiation and subjection: two generalizations of „identifying the object"
  - They broaden the scope of the first solution without protecting it from the main charge
- Observation Three: *de facto* **there are three main roles**: identification of object, identification of concept and **establishing the propositional unity**:
  - [T]hree things are required to be true of any sentence [...]: (1) there is contained in the sentence an expression specifying the particular in question; (2) there is contained in the sentence an expression specifying the general concept in question; (3) there is something contained in the sentence as a whole, or some feature of the mode of combination of the two aforementioned expressions, which shows that we have a truth-or-falsity-yielding combination [...] which yields truth if the particular exemplifies the concept [...] and falsity if not' (1974:17)

A new proposal

Or rather: a renovation of a quite old one…

- The same methodology: we are looking for some fundamental features of our thinking about the world
- Different starting intuitions: in the place of the ontological distinctions from *Individuals* we shall take and raise to the rank of our transcendental foundations the following two intuitions:
  - Functoriality (Frege)
  - Dual Intentionality: propositional and nominal (Husserl)

Functoriality Principle: Exposition

- Composing expressions is an application of a function to an argument; any compound must consist of an 'unsaturated' part and a part which can serve as an argument of it and in so doing 'saturate' it:

  > For not all the parts of a thought can be complete; at least one must be 'unsaturated', or predicative; otherwise they would not hold together (Frege 1892a: 54).

  > Statements in general […] can be imagined to be split up into two parts; one complete in itself, and the other in need of supplementation, or 'unsaturated' (Frege 1891: 31)

Functoriality Principle: Difficulties

- „Unsaturation" by itself is incomprehensible
  - Ramsey/Strawson: as a part of a sentence, subject and predicate are equally „unsaturated"
- Frege: It can be understood as corresponding to ontological distinction: unsaturated expressions (functors) denote unsaturated objects (functions, concepts) [or: a functor = a **name** of a function]
- *Sed contra:* anything can be predicated of, functions and concepts notwithstanding (the names of such objects can play the role of subjects and therefore not the role of functors) – cf. The paradox of the concept of a horse.

> It must indeed be recognized that here we are confronted by an awkwardness of language, which I admit cannot be avoided, if we say that the concept *horse* is not a concept whereas e.g. the city of Berlin is a city and the volcano Vesuvius is a volcano [...]. In logical discussions one quite often needs to assert something about a concept [...]. Consequently, one would expect that the reference of the grammatical subject would be the concept; but the concept as such cannot play this part, in view of its predicative nature; it must first be converted into an object, or, speaking more precisely, represented by an object (Frege 1892a: 46).

> I admit that there is a quite peculiar obstacle in the way of an understanding with my reader. By a kind of necessity of language, my expressions, taken literally, sometimes miss my thoughts; I mention an object, when what I intend is a concept (Frege 1892a: 54).

Dual Intentionality (*Logical Investigations*)

- The language is founded in two kinds of intentional acts: **nominal** and **propositional**. We do not refer to the world *simpliciter*; we refer nominally or propositionally

   > Nominal acts and complete judgements never can have the same intentional essence, and [...] every *switch* from one function to the other, though preserving communities, necessarily works changes in this essence (Husserl 2001, Vol. 2:152).

   > Naming and asserting do not merely differ grammatically, but 'in essence', which means that the acts which confer or fulfil meaning for each, differ in *intentional essence*, and therefore in *act-species* (Husserl 2001, Vol. 2:158).

The problem of unsaturatedness resolved

- An expression is saturated when it expresses a complete intentional act: propositional or nominal (thus we have two kinds of saturated expressions: names and sentences). Other expressions are unsaturated
  - Answer to Ramsey: indeed both subject and predicate fall short of being complete sentences, but a name in the subject position expresses complete intentional act (nominal), whereas predicate does not express any complete intentional act, neither nominal nor propositional
  - Answer to Horse Concept Paradox: The saturation or unsaturation of an expression does not depend on whether the *denotation* of the expression is saturated or not (whether it is, ontologically, a particular or a concept or a function) but on whether it expresses a full intentional act or not. A name is saturated, even if it is a name of an ontologically unsaturated object, such as a concept or a function. When we speak about a concept then, we do not convert it in any way. We simply name it, instead of predicating it of something. This is the difference of the logical role, not of the denotation.

Frege still needed

- Husserl explains unsaturatedness; but lacks a unified principle of composing meanings:

   > In a purely logical form-theory of meanings [...] we must fix the primitive forms of independent meanings, of complete propositions with their internal articulations, and the structures contained in such articulations. We must fix, too, the primitive forms of compounding and modification permitted by the essence of different categories of possible elements. [...] After this, we must systematically survey a **boundless multitude of further forms** [...]. [For instance] Any two propositions yield, when combined in the form *M and N,* another proposition, any two adjectives another adjective [...]. To any two propositions, M, N, there belong, likewise, the primitive connective forms *If M then N*, *M or N*, so that the result again is a proposition. To any nominal meaning *S*, and any adjectival meaning *p*, there belongs the primitive form *Sp* (e.g *red house*), the result being a new meaning fixed by law in the category of nominal meaning. We could in this manner give many other examples of primitive connective forms (Husserl 2001, Vol. 2: 69)

- This piecemeal approach is devastating to the autonomy of logical syntax against the school grammar of a given particular language – as the source of this „boundless multitude of forms" is just this grammar
   - Therefore it is obviously inferior to Fregean functoriality, which is a single fundamental principle for composing meanings and may be taken as a transcendental *a priori* in the Strawsonian sense

Towards logical grammar

- Functoriality by itself does not generate any particular grammar
- Husserl's ideas generate grammar in a Montagovian style:
  - There is functional application but all (numerous) syntactic rules are provided independently in order to reconstruct some fragment of some particular language
- Combination of Frege and Husserl generates a different grammar: namely the Categorial Grammar of Ajdukiewicz
  - Functional application + single transcendental syntactic rule
  - Ajdukiewicz invented not just an original calculus formalizing formerly existing informal grammar; but a new grammar founded in a novel combination of two ideas never combined (successfully) before.

Basic Syntactic Rule (BSR)

- *Every saturated compound expression* (i.e. a name or a sentence) *parses into exactly one n-place unsaturated functor and n of its saturated arguments (if any argument happens to be a compound expression itself, the rule applies accordingly).*

- In atomic sentences the functor is an n-place sentence-forming functor, while its arguments are n names (n $\geq$ 1):

    A judgement is based on at least one presentation, just as each expressed statement contains at least one name […]. There is, however, no maximal upper limit to such presentations. Indefinitely many presentations can nest in a single judgement (Husserl 2001, Vol. 2: 149).

Syntactic categories vs syntactic roles

- Ajdukiewicz: „a sentence", „a name", „a functor" refer to syntactic **categories,** thus to a sort of sets of expressions.
- Strawson/Husserl: sentences, names and functors are not kinds of expressions, but syntactic **roles**
  - The same expression may play different roles in different circumstances:
    - „yellow" can play the role of a name, as in „Yellow is a bright colour", or a functor, as in „A yellow car hit the tree"
  - Roles are constituted by the structure of intentional acts and the functoriality principle
    - A plausible way of indicating how exactly particular roles are constituted (identifying these roles) is attributing to them well-known type-indicators: *n, s, n/s, s/nn …..*

Cognitive aspect of syntax

- The structure of a sentence corresponds to the structure of a compound intentional act (syntax mirrors intentionality)
  - **The choice of names**: how we individuate our presentations
  - **The arrangement of names:** the cognitive structure in which the presentations are embedded

Syntactic Roles vs Syntactic Positions

(1)   Mary | loves | John
(2)   Mary | loves John--------------------

(2')   Mary | loves   John
                                  loves | John

- The operator position in an expression is the syntactic position that is occupied by the constituent of the expression that actually is the functor precisely in this whole expression (not in any part of it).
    - Thus 'loves' is in the operator position in (1) but not in (2)

Notations for syntactic positions
Polluted water affects heavily public health

- Graphical form:

Polluted			water		affects	heavily			public			health
(*n*)						(*s/nn*)*					(*n*)	
	(*n/n*)*			(*n*)		(*s/nn*)	((*s/nn*)/(*s/nn*))*		(*n/n*)*		(*n*)	

- Polish notation: functor goes first, arguments subsequently follow:
  - Heavily affects polluted water public health
- Ajdukiewicz's strings:
  - to the whole analyzandum we assign the sequence (1), to the operator on the first level of analysis (1,0), to the first argument of the operator (1,1), to the second (1,2), to the third (1,3) and so on. If anything of it is still a compound expression and has assigned the sequence (n,m), we assign (n,m,0) to the operator in it, (n,m,1) to the first argument of the operator, (n,m,2) to the second argument and so forth.
  - (1,0) for 'affects heavily', (1,1) for 'polluted water', (1,2) for 'public health', (1,0,0) for 'heavily', (1,0,1) for 'affects', (1,1,0) for 'polluted', (1,1,1) for 'water', (1,2,0) for 'public' and (1,2,1) for 'health'.

Cleaning the lawn

- Roles [syntactic categories]:
  - (A) raking the leaves; (B) gathering raked leaves in a container; (C) transporting the container to the compost-hole; (D) emptying the container; (E) transporting the container back to the lawn
- Players [kinds of expressions]:
  - A rake, a broom, one's bare hands, a toothbrush...
- Arrangement of roles [syntactic positions]:
  - ABCDE – ABCDE – ABCDE (daddy)
  - ABDCE – ACEBD – CECEC (kids asked for help)

The development of Categorial Grammar

- Ajdukiewicz:
  - The only syntactic operation is reduction of types
  - The only kind of reduction of types is functional application
- Geach:
  - The only syntactic operation is reduction of types
  - Two kinds of reduction of types:
    - Functional application: $(x/y)\ y \rightarrow x$
    - Functional composition: $(x/y)\ (y/z) \rightarrow (x/z)$
- Further modifications (Flexible Categorial Grammar)
  - Many syntactic operations:
    - Reduction of types (both kinds)
    - Modifying of types:
      - Type raising: $x \rightarrow y/(y/x)$
      - Type lowering: $(x/y)/(x/y) \rightarrow x/x$

Comments on developments

- Geach wanted functional composition in order to satisfy his medieval taste for having negated predicate on a par with negated sentence
  - (s/s) (s/n) according to Ajdukiewicz is syntactically incoherent, whereas according to Geach (s/s) (s/n) → (s/n)
- He detested type-modifying:
  - He never allowed for type lowering understood as lumping together (s/s) and (s/n)/(s/n) because although both functors may modify a predicate, only the former may modify a sentence
    - Well-formed are both: *John probably loves Mary* and *John passionately loves Mary*
    - *Probably John loves Mary* is well-formed whereas *Passionately John loves Mary* is ill-formed
  - Even worse is type-raising or lumping together names and quantified phrases: (n) → (s/(s/n))
    - The distinction of basic and derived categories is blurred
    - Raising affects the order of syntactic positions (kids on the lawn!)
      - Both (s/n) n and (s/(s/n)) (s/n) yield a sentence; but this is a **different structure** in each case: the predicate is the operator in the former and an operandum in the latter.

Some further morals
Execution of the Duc d'Enghien

A. Napoleon was the man who ordered the execution of the Duc d'Enghien
| (*n*) |*s/nn*| (*n*) |

B. Napoleon ordered the execution of the Duc d'Enghien
| (*n*) | (*s/nn*) | (*n*) |

or, alternatively:

B'. Napoleon ordered the execution of the Duc d'Enghien
| (*n*) | (*s/n*) |

Strawson: the difference is in former knowledge about the execution of the duke
Categorial Grammar: it doesn't matter who **knows** and who doesn't know anything about the existence of a person who ordered the execution; what matters is whether the speaker **performs an intentional act** of presenting to himself „the man who ordered the execution" – or does not perform such an act.

The exorcisms of Meinong's Spectre

- A name – in our sense – represents **a place** for an object in the structure of our thinking rather than the object itself
  - Such a place might have a physiological representation in the brain processes (which does not interest us here), but it also might and should have a logical representation in the abstract model of the language (and the category of name in CG serves precisely that function)
  - It might be understood as a sort of a cognitive hanger for descriptions, proper names and all sorts of attempted reference.
    - It preserves its identity independently from both descriptive content ascribed to it and actual reference; thus might lead us out of the controversy between descriptive and referential theory of proper names

Singular terms revisited
Two intuitions

- Intuition one:
  - [Singular term] is an expression that can function as the subject of the sentence but not as the predicate (Stirton 2000: 196).
  - Singular terms form one of the two categories of *complete* expressions, the other being that of *sentences.* In devising criteria for singular terms, we may presuppose a capacity to recognize well-formed sentences as such (Hale: 2001a:33).
  - Predicates can be defined in terms of singular terms and sentences as follows: a predicate is what remains when one or more singular terms has been removed from a sentence. (We assume that we have some means for determining what a sentence is) (Wetzel 1990:239).
- Intuition two:
  - A singular term is any expression the function of which is to convey a reference to a particular object (Hale 2001a: 31).
  - [Genuine singular terms] take individuals as their semantic values (Justice 2007: 363)
  - [or are engaged in certain] relationship […] to just one object (Devitt 1974: 183).

Two intuitions – one concept?

- It is believed that the fact that singular terms are saturated depends somehow on the fact that they are related to single individuals
  - We might look for some semantico-ontological determiners of singular terms as opposed to general terms and use these determiners in establishing the distinction of subject and predicate (Strawson)
  - We might look for some syntactico-logical determiners of singular terms as opposed to predicates and use these determiners as tools for ontological research, e.g. in the search for kinds of individuals (Dummett, Wright, Hale)

Two intuitions – two concepts!

- There should be two distinct concepts; connecting the two intuitions into one concept is just a mistake:
  - Saturatedness does not depend on referring to (single) individuals
  - Singular terms opposed to predicates are just grammatical names, i.e. they are **roles;** whereas singular terms opposed to general terms are **kinds** of expressions.

Concluding remarks

- A reflection on philosophical background of syntax establishes Categorial Grammar as a distinguished theory of syntactic aspect of natural language that answers all three questions constituting The Core Problem
- Our proposal allows for having a well motivated stance in many important controversies within the philosophy of language:
  - About the logical form (Strawson – Russell)
  - About singular terms
  - About referring descriptions and proper names
- It requires no more initial assumptions than other proposals, like Strawson's – namely, that some very general ideas reflect something that conditions the way of our thinking about the world
- And - contrarily to them – it works!