

Teresa Hołówka
THE LOGICAL SUBJECT OF A SENTENCE BY
KAZIMIERZ AJDUKIEWICZ

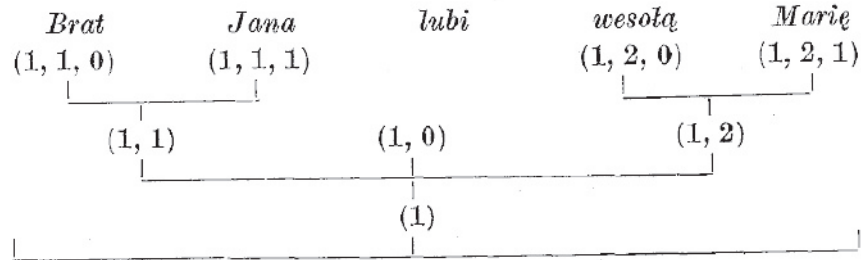
Originally published as "Podmiot logiczny zdania w ujęciu Kazimierza Ajdukiewicza," *Studia Semiotyczne* 4 (1973), 163–176. Translated by Lesław Kawalec.

The concept of the "logical subject of a sentence" is closely connected with such fundamental and controversial semiotic issues as the criteria of natural language syntactic and semantic category identification, making a distinction between individual and general names, between proper names and common names and descriptions, the indicative and predicative function of expressions, etc. What is also important — on account of the possible interpretations of the expression "be eligible for the logical subject of a sentence" — is the issue of the nonsense and substitutability of expressions in sentential contexts.

The logical subject is usually juxtaposed with and characterized by, at least, an indirect reference to a grammatical subject. However, there is no consensus on these among linguists. Even within a particular ethnic language it is difficult to give such a characteristic of formal properties of some words and expressions that would distinguish a class of potential grammatical subjects of a sentence, particularly that these attempts to reconstruct syntax without making a reference to semantic issues end up in a failure. No wonder the notion of the logical subject of a sentence has not been sufficiently explicated yet. Ajdukiewicz's study (Ajdukiewicz 1965: 344-355) is distinct in literature as it both gives an explicit definition of the subject (while most authors restrict themselves to providing vague suggestions) and very original tools for the analysis of colloquial speech (whereas logicians usually use traditional grammar coursebooks). Is the question of the subject sufficiently resolved in it? The basic syntactic categories in the dissertation

are the operator and the argument. "If an expression A lends itself to being brought down to expressions B and $C_1, C_2 \dots C_n$, where the expression B refers to $C_1, C_2 \dots C_n$ respectively and makes them one whole, then we say that B is the main operator of expression A, with C_1 its first argument, C_2 — second — and C_n — the nth argument" (Ajdukiewicz 1965: 345, 346). Thus the sentence *Brat Jana lubi wesołą Marię* [John's brother likes the cheerful Mary] is factorized into the main operator — *lubi* [likes] — the first argument — *brat Jana* [John's brother] — and the second argument *wesołą Marię* [the cheerful Mary].

The main operator and its arguments create members of the first order in the expression A; in other words, they are connected to A by the relationship of direct syntactic subordination. They can be compound expressions, with the main operator and arguments. Then the first argument of the main operator of the sentence investigated here — the expression *brat Jana* [John's brother] — is then parsed into the operator *brat* and the argument *Jana*; the second argument — the phrase *wesołą Marię* [the cheerful Mary] — is parsed into the operator *wesołą* and the argument *Marię*. As we can see, each part of the k'th order of expression A is connected by the relationship of direct syntactic subordination with some member of a k-1'th order in the expression. The sequence of relationships of direct syntactic subordination that connects the member of a k'th order of expression A with the same expression is called by Ajdukiewicz the SYNTACTIC POSITION of this member in expression A. He introduces special symbols that enable the formulation of the syntactic structure of a sentence without the need to order the signs, as was the case in the purely positional language of syntax as presented in the previous tract *O spójności syntaktycznej* (Ajdukiewicz 1960). The member of order 0, that is, the expression being currently analyzed, is designated with the symbol (1). If the syntactic position of any member in A is assigned the symbol (k), the syntactic position of the main operator of the member is designated as (k, 0), and the positions of subsequent arguments — with symbols (k, 1), (k, 2) . . . (k, n). The sentence *Brat Jana lubi wesołą Marię* [John's brother likes the cheerful Mary] will thus be parsed as follows:



Its syntactic structure is expressed by the following:

(1,1,0) (1,1,1) (1,0) (1,2,0) (1,2,1)

Another step is the indication of the semantic categories of colloquial speech. Ajdukiewicz distinguishes between: individual names, that is, the "expressions that denote individuals," designated with the symbol "i", sentences, that is, "expressions that denote a logical value," that are designated with the letter "w", as well as functors — "expressions that denote functions, that is, such relationships that attribute an object (correlate) to any one, two, three, ... specific objects of a kind." Functors come in four classes: name-generating functors from name arguments, designated with the indexes $\frac{i}{i}, \frac{i}{i,i}, \dots$ (such as *wesoła* [cheerful]), sentence generating functors from sentential arguments, designed with the indexes $\frac{w}{w}, \frac{w}{w,w}, \dots$ (such as *lub* [or]), sentence generating functors from name arguments, denoted with the indexes $\frac{w}{i}, \frac{w}{i,i}, \dots$ (such as *lubi*, [{he/she} likes]), and finally functor generating functors from functor arguments, as illustrated by the adverb *głośno* [loudly], which — related to a functor type $\frac{w}{i}$ (*śpiewa* [sings]) — forms a functor expression type $\frac{\frac{w}{i}}{i}$, such as *śpiewa głośno* [sings loudly]. We then append such a functor with the index . Following those initial settlements, Ajdukiewicz introduces the following definition: "If the main operator of the sentence belongs to the category $\frac{w}{i}$, and its only argument is an individual name (i), then the syntactic relationship between these will be considered ... the relation of predicate and subject" (Ajdukiewicz1960: 359). Along the lines of what has been said, an example of this kind of relationship could be the relationship that holds between the expression *śpiewa głośno* [sings loudly] and the expression *Jan* in the sentence *Jan śpiewa głośno* [Jan sings loudly].

There we are with three issues being posed quite clearly. First, which has been ignored in literature so far, is that "being a subject" does not mark a set of expressions or even their pairs; rather, it marks a set of ordered threes. Ajdukiewicz says that we cannot speak of any expression A that it

is a subject in general or that it is a subject of some sentence C. A decent formulation necessitates the expression "In sentence C, A remains towards B in the relationship of a subject to a predicate." Second, "being a logical subject" is not a purely syntactic relationship and neither is it a purely semantic one. It obtains between expressions marked by formal properties and some semantic functions. Third, only an individual name can be a logical subject: a proper name or a specific description. In sentences such as *Moje dzieci zachorowały na szkarlatynę* [My children have gone down with scarlet fever] or *Jeden z nich pojedzie do Jugosławii* [one of them will go to Yugoslavia] there is no subject-predicate relationship in a logical sense.

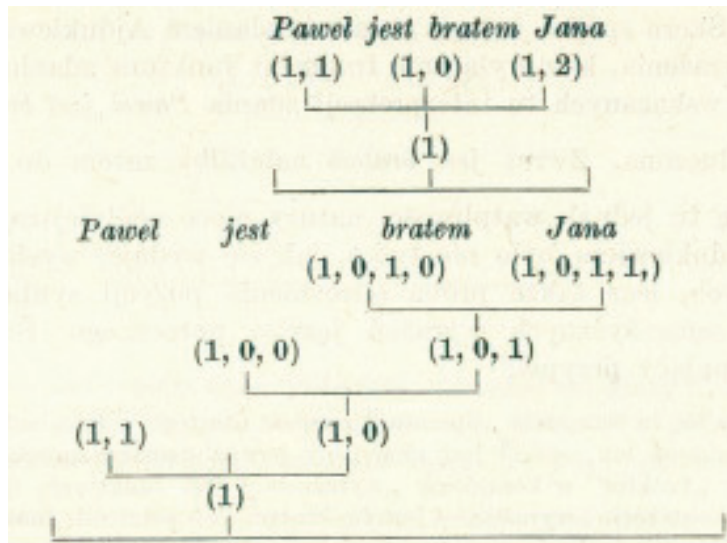
Ajdukiewicz's concept does not provide any sufficient criteria allowing the resolution of the issue of subject and predicate in the case of every sentence and the difficulties it encounters seem quite typical for the logical semiotics of a colloquial sentence.

Above all, the status of nominal predicates has not been presented consistently enough. On the one hand, the author treats the copular verb as the main operator of simple indicative sentences. It assigns the following structure to the sentence (Ajdukiewicz1960: 349):

Socrates est philosophus

(1,1) (1,0) (1,2)

It would follow that in comparison with the definition, in this sentence the subject-predicate relationship does not obtain as the main operator involves here, like in a sentence such as *Jan lubi Marię* [John likes Mary], more than one argument. One should think, though, that this would go against the actual intention of Ajdukiewicz's work. Indeed, the next passage reads: "in natural languages, predicates are always *verba finita*, such as 'lives,' 'sings,' or expressions such as 'is human.'" (Ajdukiewicz1960: 353). Structures made up of an auxiliary verb and a noun or adjective would thus be main operators in simple sentences and would constitute an element of the category $\frac{w}{i}$. In other words, traditional general names would either be dependent passages of such expressions as 'is human' or independent expressions bound by the operator 'is' which, with this kind of interpretation would not be a sentence generating functor from two name arguments, but a functor generating functor from a functor argument. It is difficult to apply the same procedure for expressions made up of an auxiliary verb and a noun that can be included in a syntactic structure with another noun. Take the sentence *Paweł jest bratem Jana* [Paul is John's brother]. We can assign two different structures to it:



In the first case, the main operator of the sentence would be the expression *jest bratem* [is ... brother], which would need to be interpreted as a sentence generating functor from two individual names, thus being a predicate in a logical sense. In the other, the expression 'is John's brother' would be a compound functor of the type $\frac{w}{i}$. Between the word *Paweł* and the expression 'is John's brother' there would obtain a subject-predicate relationship, then. This expression would be divided into the functor *jest* [is] — an element of the class $\frac{w}{i}$, — the functor *bratem* [brother] — of the class $\frac{i}{i}$ — and an individual name *Jana* [John's].

Which of these interpretations should be selected? Ajdukiewicz claims that "if we interpret the notion of word *in specie* broadly, we can consider general names such as *człowiek* [human] to be the same words as *verba finita człowieczy się* [humans oneself] (if one takes the liberty to use a new coinage instead of *jest człowiekiem* [is human])" (Ajdukiewicz 1960: 353). The word *człowiek* [man/human] and the expression *jest człowiekiem* [is human/is a man] would thus be two specimens of the same expressions, and the difference between them would be — like inflection suffixes — an exponent of their different syntactic position: the position in sentences, the position of an operator and the position of an argument.¹ Can we similarly

¹The notion of "word *in specie*" would necessitate a broader treatment here. Ajdukiewicz apparently identifies it with what linguists call a 'lexeme,' that is a set of words or expressions of the same core and the same lexical signification (*kobieta, kobiecie, kobieto*, etc. [a woman, to a woman, hey, woman!]). Such a position would assume, however, that the same word *in specie* is, say, the pair *Jan-Janowie* [John — {pl.} Johns], where its first element is an individual man, and the other is not.

treat pairs such as 'brother — is a brother?' If the copular verb *jest* [is] is not, in Ajdukiewicz's opinion, an independent expression but only a fragment of a sentence generating functor, the other of the interpretations of the sentence *Paweł jest bratem Jana* would be ruled out. The expression *jest bratem* [is a brother] would thus belong to the class $\frac{w}{i,i}$. However, some more general doubts come up. The intention of Ajdukiewicz's paper was, apparently, not only the elimination of general names, but also an attempt to make a distinction between syntactic positions and semantic categories of colloquial language. The following footnote would testify to this:

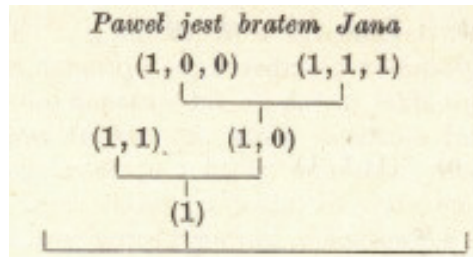
I have used the term *operator* instead of *functor*, quite commonly used in Polish nomenclature, because the latter carries some ambiguity. *Functor* means something else in the context "expression *f* is a functor (just that)," and something else in the context "expression *f* is a functor (or performs as one) in expression *W*." In the contexts of the first kind, the term *functor* is the name of some (absolute) property of some expressions, but in the contexts of the other kind, it is the name of the relation of this expression to another one [...]. To avoid this ambiguity, I introduce the term *operator* where I mean the relation of this expression to another one, namely, regarding the syntactic role one expression performs in another expression. I leave the term *functor* as the name of some absolute property of some expressions. The notion of an *operator* is clearly a syntactic notion while the notion of a *functor*, at least in the sense this paper assigns to it, a semantic notion (Ajdukiewicz1960: 346).

The same expression can occupy various syntactic positions in a sentence. So, the word *brat* [brother] (= *jest bratem* [is ... brother], if we agree with Ajdukiewicz's proposition of their being identical) can be:

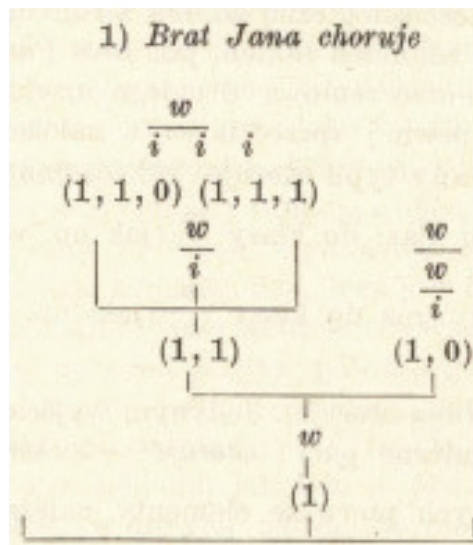
1. the main operator of the first argument of the main operator of the sentence, such as *brat Jana lubi wesołą Marię* [John's brother likes the cheerful Mary];
2. the first, second or third argument of the main operator of the sentence such as *Brat śpi pod drzewem* [brother is sleeping under a tree], *Paweł rozmawia z bratem* [Paul is talking to {his} brother], *On dał to bratu* [He has given it to {his} brother];
3. the main operator of the sentence such as *Paweł jest bratem Jana* [Paul is John's brother].

Any expression — as would follow from Ajdukiewicz's remarks — is an element of exactly one semantic class. Can we really consistently treat

the pair *brat — jest bratem* [brother — is a brother] as two specimens of the same expression? Which semantic class one would need to count it part of? The previous analysis of *Paweł jest bratem Jana* (upon the elimination of the independent copular verb *jest*, as intended by Ajdukiewicz) would indicate that it is to the class $\frac{w}{i,i}$. There is another possibility. We can parse these sentences as follows:



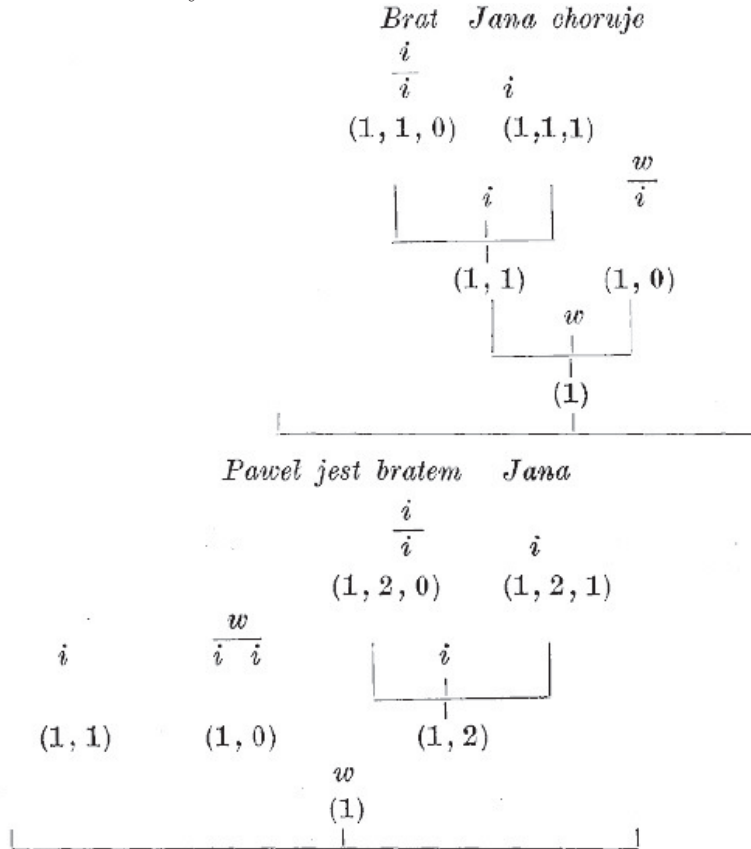
The expression *brat — jest bratem* [brother, is a brother] would then be counted as $\frac{w}{i}$, and the expression *brat Pawła — jest bratem Pawła* [Paul's brother, is Paul's brother] — into $\frac{w}{i}$. With the first interpretation in the sentence *Paweł jest bratem Jana* the subject-predicate relationship does not obtain; with the other, it does. The first one assumes that the expression *jest bratem* [is a brother] denotes a relationship between two individuals and the logical value of the sentence; the other — that the expression *jest bratem Jana* [is John's brother] denotes the relationship between some individual and the logical value of the sentence. Let us now see how, in light of the settlements so far, analyze the sentence *Brat Jana choruje* [John's brother is ailing]:



essential feature of the respective language systems [...] is that in some specific conditions, of two expressions A and B, denoting the objects α and β respectively, there arises a compound expression of some other object γ rather than α or β . If A is a functor, denoting function α , specified for objects of some kind, and does not refer to expression B, denoting object β of this very kind, then the expression made up of A and B denotes an object assigned to object β by function α . Thus the expression "Socrates' father" is a name of Sophroniskos" (Ajdukiewicz 1960: 351). If, however, expressions such as *ojciec Sokratesa* or *brat Jana* denote individuals, then (given the dependent character of the copular verb *jest* [is]) assuming they are the same expressions as *jest ojcem Sokratesa* [Socrates' father] or *jest bratem Jana* [John's brother], they would denote individuals also in such expressions as "Sophronishos is Socrates' father" or *Paweł jest bratem Jana* [Paul is John's brother]. These expressions would then fail to be sentences as they would comprise of two individual names, which is obviously absurd. There are three equivalent solutions possible here.

First, we can say that the expression *brat* — a brother is a sentence generating functor from two individual names, which in sentences of the type *Paweł jest bratem Jana* [Paul is John's brother] denotes the relationship between two individuals and the logical value of the whole. But when it performs as the main operator of an argument, by itself does denote something; it is part of a compound expression that denotes some individual. Second, the expression *brat* — *jest bratem* can be treated as a functor that generates a sentence generating functor from an individual name, which in sentences such as *Paweł jest bratem Jana* denotes a relationship between the function of being a brother and an individual. When it forms part of an argument of the main operator of a sentence, it doesn't denote on its own but is part of an expression that denotes an individual. Both these interpretations create serious problems with the taxonomy of colloquial language expressions. If the criterion of some word belonging to some semantic category were to be its absolute semantic qualities, then we do not know what to do with expressions such as *brat* — *jest bratem*. In some contexts they denote something, in others they do not constitute independent expressions but parts of compounds denoting expressions. Which of their properties would decide their taxonomy and is the word brother in 'John's brother is ailing' the same expression as 'is a brother' in the sentence *Paweł jest bratem Jana* [Paul is John's brother]? A third interpretation is possible too: recognizing the word *in specie* *brat* [brother] as a sentence generating functor from an individual name. The sentences *Brat Jana choruje* and *Paweł jest bratem*

would then be analyzed as follows:



An independent denotative role would thus need to be granted to the copular verb *jest* [is], though, equating the pair *brat-jest bratem* would need to be abandoned and the category of general names would need to be introduced to the description of colloquial language. This procedure would be at odds with Ajdukiewicz's intentions as presented in the paper, but it would guarantee the disjunction of name categories. It is not hard to notice, though, that functor categories would become inseparable as a result. With this interpretation of language, the copular verb *jest* [is] would constitute: a sentence generating functor from two individual names (such as *Paweł jest bratem Jana*), a sentence generating functor from an individual name and a general name (*Paweł jest spokojny* [Paul is calm]), and finally a sentence generating functor from two general names (*Człowiek jest rozumny* [man is rational]). Most verbs would be fraught with the same ambiguity.

It is impossible to determine on the basis of Ajdukiewicz's conception, which of the three interpretations would need to be chosen. All of these seem equally legitimate and equally fraught with theoretical errors. In the end,

we are unable to decide whether it is possible to consistently eliminate the category of general names from the description of colloquial language as a result of equating such pairs of expressions as '(hu)man — is a (hu)man,' 'brother — is a brother,' etc. and treating those as sentence generating functors from individual names without abandoning the assumption of semantic classes being disjointed. Note that most expressions which Ajdukiewicz would tend to count as functors can, in colloquial language, function as alongside arguments or without them, which brings up another portion of difficulty. Thus, we would be inclined to attribute to the sentence *Jan czyta* [John is reading] the following structure: $i — (1, 1) \frac{w}{i} — (1, 0)$ and treat them as a pure example of a subject-predicate relationship. On the other hand, in the sentence *Jan czyta Marii* [John is reading to Mary], the functor *czyta* [is reading] binds two arguments. How should then the verb *czyta* [is reading] be classified if we mean to be consistent in defending the position that the semantic classes of colloquial language are disjunct and that the criterion of an expression belonging to this or that class were to be its absolute semantic properties, independent from sentential context?

So far we have not dealt in more detail with individual names. The criterion of an expression belonging to this class is, in Ajdukiewicz's conception, the denotation of an individual. But this procedure, in contact with colloquial language, proves of little use to its analysis. We can use the same word or expression so it refers to an individual or in such a way as to refer to a group of individuals, and this is a key skill for fluent use of language. The word *brother* can be a true indication of a number of people, and so it is not an individual name according to traditional systems of logic. But a context can be shown without any difficulty where the statement most certainly refers to exactly one person, such as *Brat pojechał wczoraj do Krakowa* [Brother went to Cracow yesterday]. Someone who is making this kind of statement is using the word *brat* in such a way that it refers to only one individual. So is the case with the expression *jakiś chłopiec* [a/some boy]. Separated from sentential contexts, it denotes more than one individual and so it does not differ from the expression *jacyś chłopcy* [some boys]. But of the pair of the pair of sentences *Jakiś chłopiec kradnie jabłka w twoim ogrodzie* [a boy is stealing apples in your garden] and *Jacyś chłopcy kradną jabłka w twoim ogrodzie* [some boys are stealing apples in your garden] each implies something else. The former that the thief is one; the latter that there are at least two. Using the former expression we can indicate exactly one individual, but we cannot do that with the other sentence. This fact is possibly all the more significant for the description of colloquial language

than the fact that both these expressions, taken out of context, can refer to more than one person.

The observation that most expressions from colloquial language change their semantic roles together with the change of the sentential context might give rise to two varying conclusions. First, one may maintain that semantic classes are inseparable in colloquial language. Also, most words and expressions can be elements of more than one category. No expression can be an individual name in general, but it can only be one in a specific sentential context. Depending on how we use it, the word 'brother' can be an individual name or a general name. This interpretation of colloquial language would demand that extralinguistic contexts be included into semiotics as well. So, empty names most certainly include such expressions as *kwadratowe koło* [square wheel] or *ten, który się nigdy nie narodzi* [the one who will never be born]; however, in order to determine whether the expression *mój najstarszy brat* [my eldest brother], in the sentence *Mój najstarszy brat ma dwoje dzieci* [my elder brother has two children] is an empty or individual name, one needs to know whether someone who uttered the sentence does have male siblings or not. Including extralinguistic contexts into semiotics can face a charge that such a position makes the analysis of colloquial language rather sterile in scholarly terms. We ought to investigate and describe only that which we know about the functions of expressions upon the mere knowledge of language. Otherwise — all the more so that we cannot predict all extralinguistic contexts where any given expression can be used — the description of language would consist in prolonged collections of examples and facts, which would never lead to any generalizations, indispensable in any science.

Second, as was done by Ajdukiewicz, one can claim that semantic classes of colloquial language are disjointed. But since expressions change their semantic roles depending on the sentential contexts where they occur, one either would need to assume that most utterances in colloquial language are incomplete and make up abbreviated forms of compound statements or claim that most colloquial language expressions are homonymous, that is, expressions sharing the same spelling and pronunciation but different meanings. Both versions of this interpretation of language are fraught with some difficulty. So, the sentence *Brat pojechał wczoraj do Krakowa* [... brother went to Cracow yesterday] can be treated in two ways. One can allege that it is an incomplete utterance, being a shortcut of one of the following sentences:

1. My eldest [*najstarszy*] brother went to Krakow yesterday;

2. My youngest [*najmłodszy*] brother went to Krakow yesterday;
3. My only [*jedyny*] brother went to Krakow yesterday;
4. One of [*jeden spośród*] my brothers went to Krakow yesterday;
5. Someone's [*czyjś*] brother went to Krakow yesterday, etc.

One can maintain that it is an ambiguous sentence because it includes the word *brat* [brother], which in reality corresponds to a set of homonyms: *brother*¹, *brother*², *brother*ⁿ.

Obviously, without any in-depth knowledge of the situation where this utterance was made, we do not know which of the versions was in fact used or which of the meanings of the word 'brother' the speaker had in mind. Determining this, however, is not the researcher's job; they stop at making a note of ambiguity or incompleteness.

The theory of the "incompleteness" of an utterance, makes the description of language practically impossible. Even simple grammatical sentences prove complex statements, requiring meticulous supplementation which hardly lend themselves to elementary syntactic analyses. Also, it treats as a flaw what is in fact an advantage of colloquial language — the fact that almost any expression can be used in a variety of ways. The most serious difficulty would be associated with the notion of 'incompleteness,' though. Clear criteria would be needed to determine when an utterance is incomplete. Most verbs, as we have seen, can come with a number of nominal arguments as well as a number of adverbials of place, time, etc. Also, it is not quite clear whether the status of such adverbials is exactly the same as the status of nominal arguments, or whether they are optional elements. So, because the verb 'reads' [*czyta*] can occur in the following context: *Jan wolno czytał Marii w ogrodzie ostatnią powieść Konwickiego* [John was slowly reading to Mary the latest novel by Konwicki], the sentence *Jan czyta* [John is reading] ought to be treated as an abbreviated form of the utterance *Jan jakoś czyta coś komuś* [John is reading something to someone somehow]? On top of the obvious difficulties in establishing the criteria of incompleteness, another doubt emerges here. Even if we assume that the sentences "...brother went to Krakow yesterday" or "John is reading" are incomplete, it is certainly not the same kind of "incompleteness" as in *jest nauczycielem* [{he/she, implied; L.K.} is a teacher] or *stuka* [{he/she, implied; L.K.} taps]. A distinction should therefore be made between the two kinds of "incompleteness."

Similar charges can be levelled against the theory of "ambiguity." Making the simplest possible lexicon of some ethnic language would be a

Sisyphus' task with this kind of interpretation and the fact that despite repeated ambiguity of words, we do communicate, would border on the impossible. The theory of meaning would cause most problems, though. The sentence "brother went to Cracow yesterday" is certainly "ambiguous" in a different sense than *Brat ojca namalował* [brother has painted the father; father's brother has painted]. One could go to great lengths explaining that the ambiguity of the sentence *Brat ojca namalował* is of a syntactic nature because it is not clear whether the word *ojca* is an argument of the word *brat* or the second functor of the verb *namalował*. But the sentence *Brat odmawiał breviarz* [... brother was praying from the breviary] is also ambiguous but this is not a syntactic ambiguity. That the word brother can either mean the same as "a male sibling" or a "monk," which is definitely another kind of ambiguity than the fact that the word brother can mean "the eldest...", "one of ..." etc. Using the word 'ambiguous' in both of these senses would need serious modifications in the understanding of the word 'meaning.'

As can be seen from the above discussion, a solution to the issue of the logical subject of a sentence is yet to come, and that might not be soon. What would be needed is a preselection of one of the many interpretations of colloquial language, and at least a provisional elimination of problems that each of these entails; deciding whether the category of general names should be abandoned for the sake of functors or, along with tradition, it should be kept; finally, criteria should be specified — precise and adequate consideration of the way in which expressions function in colloquial language — of "being an individual name," "being a functor" etc. One can quite sensibly ask, though, whether the notion of logical subject is as useful as it is problematic. Irrespective of the possible differences in positions, the subject-predicate relationship is characteristic of the simplest sentences of colloquial language. In the remaining cases it proves a useless concept. One can also doubt whether this relationship indeed deserves some special treatment. Along with the concept by Ajdukiewicz, which has been discussed here, in the sentence *Paweł śpi* [Paul is sleeping] there obtains a subject-predicate relationship, whereas the sentence *Paweł lubi Marysię* [Paul likes Mary] does not have it. Other than the issue that there are far more functors in language that have two or more arguments than there are those with one argument, one can provide no good reason to treat as the subject an individual name only when it is the one and only argument. Both the word *Paweł* in the first sentence and the words *Paweł* and *Marysię* in the other serve the purpose of indicating some individuals. Why not accept that a sentence can have more than one logical subject, then, that is, the fact that "being a subject" in a

sentence is tantamount to "being an argument referring to an individual?"

Bibliography

1. Ajdukiewicz, Kazimierz (1960) *Język i poznanie. vol. I: Wybór pism z lat 1920-1939*. Warszawa: PWN.
2. Ajdukiewicz, Kazimierz (1965) *Język i poznanie, vol. II: Wybór pism z lat 1945-1963*. Warszawa: PWN.