

APPENDIX 4.

CHAPTER 2. THE STRUCTURE OF PROPOSITIONS.

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2. We consider propositions.

A proposition is a statement which either affirms or denies. It may be simple or complex. The only requirement is that it should not go beyond the bounds of a sentence. Examples of propositions are the following: (1) His name is John; (2) Three men went to Monrovia yesterday; (3) my mother and my father are old; (4) Flumo ate a pineapple, and Sumo ate a pawpaw; (5) if I don't sleep tonight, I will be tired tomorrow; (6) All men are mortal, but some men live longer than others; (7) not every man is six feet tall; (8) that James is a man is equivalent to saying that James is a rational animal, according to Aristotle.

2.0. Propositions are ~~constructed~~^{constructed} out of more elementary terms.

2.01. Certain of these elementary terms are descriptive of fields of attention, and these are covered in the previous chapter.

2.02. Other elementary terms have an organizational function, thus binding together terms which are descriptive of fields of attention into complete propositions.

2.021. Some of these organizational terms are morphemes and at the same time lexemes.

Examples of such terms are 'of', 'and', 'because', 'is', and so forth. Thus in the proposition 'his name is John', 'is' performs an organizational function, but does not actually refer to the field of attention in any direct way.

2.022. Others of these organizational terms are morphemes which are not at the same time lexemes.

Examples of such morphemes include pluralization, third person singular indicator for verbs, and so forth. In the sentence 'three men went to Monrovia yesterday', the plural in 'men' is a morpheme which is not also a lexeme.

2.03. Some terms have both a structural and a referential use in forming a statement.

For example, in the sentence 'John is in the house', 'in' has both a structural and a referential use. It is structural in that it bears on the fitting of 'the house' into the proposition, and it is referential in that it shows physical position.

2.1. Atomic propositions assert something to be true of the content of a field of attention.

The important thing to notice here is the fact that only one field of attention is referred to in 2.1. Moreover, only one assertion is made concerning that field of attention. Thus, of the examples listed under 2. above, (1), (2), and (3) are atomic propositions, while the others are not.

2.101. The description of the content of the field of attention is analyzed in 1.1, 1.2 and 1.3 above.

The following statements are simply given as a brief review of the material in chapter 1, and are not intended to be complete or detailed.

- 2.1011. The content is the stuff of the field of attention.
- 2.1012. The content may be countable or uncountable.
- 2.1013. Under each of the readings, countable and uncountable, the content may be further specified.
- 2.10131. If the content is countable, it may consist of objects, propositions or events.
- 2.10132. If the content is uncountable, it may consist of material, quality or activity.
- 2.102. The content of the field of attention is specified in four ways.
- 2.1021. We consider the form, or presentation, of the content
- 2.1022. We consider a particular aspect of the content as it is presented.
- 2.1023. We think of this aspect as measured in a particular way.
- 2.1024. We enumerate this measure by an ordered set of values.
- 2.103. The content of the field of attention is what we call the subject of the atomic proposition.

For example, in the proposition 'his name is John', the subject is 'his name', *SINCE* the proposition asserts something to be true of 'his name'. Another example, in the proposition 'three men went to Monrovia, yesterday', the subject is 'three men'.

- 2.1101. In English, the subject of the proposition from the content-centered view-point is not always the same as the subject of the proposition from the grammatical point of view.

For instance, in the statement 'it is two men', the subject from the grammatical viewpoint is 'it', but the content-centered subject is 'two men'. This sentence can be transformed to read 'two men are there', in which case 'two men' becomes the subject from both the grammatical and content-centered point of view.

- 2.11011. The grammatical subject and the content-centered subject sometimes agree with each other.

In the sentence, 'three men went to Monrovia yesterday', both the grammatical and the content-centered subject are 'three men'.

- 2.11012. When the two subjects do not coincide, often the grammatical subject performs a special role in pointing up the content-centered subject.

2.1102. In those cases where the grammatical subject exists in the language, we can use it as an aid in dealing with the content-centered subject.

In English, in the majority of cases the grammatical subject given us a formal means of determining the content-centered subject, since it is either identical with it or related to it in a simple way.

2.1103. But we must always remember that the focus of attention of a proposition is the content-centered subject, not the grammatical subject.

In the sentence 'it is two men' we are concerned with two men as the subject, not the neutral word 'it'.

2.1104. In what follows we will speak of the content-centered subject simply as the subject, and when we have occasion to refer to the grammatical subject we will call it the grammatical subject.

2.111. The choice of the subject depends on the point of view of the perceiver.

In the sentence 'Flumo ate the soup with pepper', there can be several possible subjects, depending on the point of view. This is indicated in English by the stress placed on the subject-word. For instance, we could say 'Flumo ate the soup with pepper', or 'Flumo ate the soup with pepper', or 'Flumo ate the soup with pepper', or 'Flumo ate the soup with pepper.' We could translate these propositions into other propositions, which might read 'it was Flumo who ate the soup with pepper', or 'it was the soup that Flumo ate with pepper,' or 'it was pepper that Flumo ate the soup with.' These differences in sentence structure appear very clearly in Kpelle syntax.

2.1111. This is true in the same way as with the content of the field of attention, since the content of the field of attention appears in a proposition as the subject.

2.1112. If the proposition has reference to two or more fields of attention, it is arbitrary which is considered primary, thus which one is considered to provide the subject of the proposition.

2.1113. This is a matter of the stress or emphasis in the proposition, which stress or emphasis can be provided through any of a number of different linguistic techniques, depending on the language.

In the examples mentioned above, it is the weight placed on the word in the proposition in English which determines the subject. In Kpelle, on the other hand, it is location in a particular position in the proposition which determines stress.

2.11122. An important example of this is the imposition of a measure upon a particular aspect of a presentation of a content, since the measure is always provided by a standard field of attention with which the given field of attention is compared.

Thus, for instance, we say that a yard is three feet long, but that a foot is a third of a yard long. In the first case, the yard is the subject of the proposition, and it is compared to a foot-length.

In the second case, on the other hand, the foot is the subject of the proposition and it is compared to a yard-length. The measure is provided by the second field of attention, and, with a given value-term, it part of what is affirmed to be true of the subject.

2.111. It may happen that the subject of the proposition is replaced by a place-holder, which is a neutral word.

For instance, we can say 'he is a hard worker', where the subject is 'he'. For another example, we can say 'I did it yesterday', where the subject is 'did'. In both these cases the subject does not in itself give any specific information about the content of the field of attention. In the first case 'he' might refer to a number of possible men. In the second case 'did' might refer to a number of possible activities.

2.112. The most common type of place-holder is the pronoun, but there are others, which might be called, for example, pro-verbs, such as 'there' replaces an adverbial phrase, and this can be called a pro-adverb.

2.113. In mathematics the place-holder is often called an unknown or a variable.

In the proposition x plus 2 equals 5, x is functioning as a pronoun. In the proposition 2 plus 3 \square 5, the box is functioning as a pro-verb. In the differential equation $f'(x)$ equals 2 $f(x)$, f is an unknown function.

2.114. Where a place-holder appears as the subject of the sentence, the intention is that the place-holder can be filled with a definite content-name, whether from a previous proposition or from internal evidence within the given proposition.

To say in English 'he is a hard worker' is only a meaningful statement if I have a way of determining the reference of 'he'.

2.115. It may be the case that the place-holder appears elsewhere than as the subject of the proposition.

If I say 'the man saw my mother', the word 'my' need not be the subject, and in all likelihood is not the subject, unless, of course, it is stressed in the sentence.

2.116. It is to be expected that in any given language the subject will be marked in at least one, and perhaps several, distinctive ways.

For instance, in English, in the absence of pronounced stress, it is expected that the grammatical subject will correspond with the subject. However, stress patterns can destroy that correspondence.

2.117. In some cases, the marking of the subject will be syntactical.

This is the case in English, if the stress pattern does not remove the subject from the place of the grammatical subject.

2.118. In other cases, there will be extra-syntactical devices, such as stress, context and gesture, which indicate the subject.

2.1133. It is important to the analysis of the pre-mathematical and pre-logical behavior in a language and culture that these ways of marking the subject be determined.

2.12. That which is affirmed to be true of the content of the field of attention can be called the predicate of the atomic proposition.

In the sentence 'three men went to Monrovia', assuming that no stress-pattern alters the situation, the subject is 'three men', and the predicate is 'went to Monrovia.' In the sentence, 'three men went to Monrovia', the subject is 'Monrovia', and the predicate is 'three men went to'.

2.1201. In English, the predicate of the proposition, speaking from the content-centered point of view, is not always the predicate of the proposition, speaking from the grammatical point of view.

The sentences under 2.12 give examples of cases where the predicates coincide and where they do not coincide. In both cases the grammatical predicate is 'went to Monrovia', but in one case the content-centered predicate differs from the grammatical predicate.

2.12011. The grammatical predicate and the content-centered predicate sometimes agree with each other.

2.12012. When the two predicates do not coincide, often the grammatical predicate performs a special role in pointing up the content-centered predicate.

2.1202. In those cases where the grammatical predicate exists in the language, we can use it as an aid in analyzing the content-centered predicate.

2.1203. But we must always remember that which is asserted of the subject, which is the focus of attention, of the proposition, is the thing of major concern, and where it differs from the grammatical predicate, it is of more interest than the grammatical predicate.

2.1204. In what follows we will speak of the content-centered predicate simply as the predicate, and when we have occasion to refer to the grammatical predicate we will call it the grammatical predicate.

2.121. The choice of the predicate depends on the point of view of the perceiver.

If I say 'three men went to Monrovia', the predicate is 'went to Monrovia', since that is what I am asserting to be the case for the three men. However, if I say 'three men went to Monrovia', then the predicate is 'three men went to', since that is what I am asserting to be the case for 'Monrovia'. It is a question of my assertion concerning that upon which I focus my attention.

2.1211. This is true just as it is true that the form, aspect, measure and value of the field of attention depend on the point of view of the perceiver.

2.12111. The form, aspect, measure and value of the field of attention are what are asserted to be true of the field of attention.

If I say 'oranges are in a set whose number is three units,' in this case I am affirming something of the oranges.

2.12112. Of course, it might be the case that the form, aspect, measure or value of a field of attention is the subject, but in this case they become the content of a new field of attention.

If I say 'this set of oranges is three units in number,' then my subject is 'this set of oranges', and the presentation-name 'set' is not part of the predicate. If I say 'the number of this set of oranges is three units', then the subject is 'the number of this set of oranges', and the predicate is 'is three units'.

2.1212. It may also be the case that the predicate of the proposition includes reference to the content of some other fields of attention,

If I say 'three men went to Monrovia', I have three fields of attention in mind: 'three men', 'went to' and 'Monrovia',

2.12121. In such a case, the predicate associates these other fields of attention with the subject-field in ways indicated by the structure of the proposition.

2.12122. One such way of associating a second field of attention is in terms of measure, where the measure imposed on the content-field is the content of another, referential field of attention,

2.12123. In fact, it may be the case that form, aspect, measure and value can be considered as fields of attention in their own right.

In the example under 2.12111, I can attend to that to which the terms 'set', 'number', 'unit' and 'three' refer.

2.121231. In most cases, it is more appropriate to consider these as parts of that which is predicated of the subject.

2.121232. But if I consider them as the contents of new fields of attention, then each of them is considered in terms of its own form, aspect, measure and value.

If I think of a set of oranges, the set itself is presented as a set, is considered under the aspect number, is measured by units, and is numbered by the number one, since only one set is under consideration.

2.122. The predicate is everything in the proposition which is not part of the subject.

In the example 'three men went to Monrovia'. This is the case in any atomic proposition.

2.1221. There are no aspects of an atomic proposition which are not part of either the predicate or the subject.

2.1222. Thus logically each could be defined in terms of the other, without requiring separate and independent definitions in terms of sentence structure and content.

2.123. The predicate of an atomic proposition may be an atomic predicate or a molecular predicate.

2.1231. In the case that the predicate is atomic, one and only one attribute is asserted of the subject.

For instance in the proposition 'the grass is green', I am asserting only one attribute of the subject 'the grass', namely, the predicate 'is green.'

2.12311. This attribute may be the content of some other field of attention.

To say 'that bird is a pigeon' is to make only one affirmation of the bird in question, namely that it is a member of the pigeon family.

2.12312. This attribute may be form, aspect, measure or value of the given field of attention.

To say 'the number of units in that set of oranges is three' is to make a simple affirmation, in this case giving only the value of the subject.

2.1232. In the case that the predicate is molecular, more than one attribute is asserted of the subject.

To say 'three men went to Monrovia', is to assert two things of the three men: that they went, and that their destination was Monrovia. Thus the predicate 'went to Monrovia' is molecular attribute of the subject.

2.12321. These attributes may have reference to other fields of attention.

In the example under 2.1232, both attributes refer to other fields of attention, namely, the activity 'went' and the destination 'to Monrovia.'

2.12322. These attributes may be chosen from the five categories under which a field of attention is viewed.

To say 'this set of oranges is three in number', is to give the value and aspect and, by implication, the measure for the set of oranges.

2.12323. These attributes may be chosen both from the five categories and with reference to other fields of attention.

To say 'this set of oranges was three in number yesterday' is to assert something about the value and aspect, and also relate it to the field of attention 'yesterday'.

2.124. Since the subject of a proposition may under other circumstances be a predicate, it is possible to speak, by extension, of atomic and molecular subjects.

These attributes may have reference to other fields of attention. In the example under 2.1232, both attributes refer to other fields of attention, namely, the activity 'went' and the destination 'to Monrovia.'

2.1241. An atomic subject, therefore, is one which is described only in terms of one attribute.

To say 'bananas are yellow' is to assert one fact about an atomic subject. Thus it is a proposition both with an atomic subject and with an atomic predicate.

2.1242. A molecular subject, therefore, is one which is described in terms of more than one attribute.

To say 'bananas are bad for you', is to assert something of a subject which has reference to two attributes, namely that the subject is bad and is bananas. Thus it is a proposition with a molecular subject.

2.125. It is necessary in a given language to determine in what ways predicates can be formed.

2.1251. The predicate formations may be grammatical in character.

2.12511. In order to determine the structures by which such predicate formation are made, it is necessary to assume the identification of the grammatical predicate with the predicate.

2.125111. We remember that this identification is usually possible in English, except where stress determines a difference.

2.125112. The correctness of this assumed identification depends on the individual language, and must be determined in each case.

2.12512. Grammatical predicate formations can be broken down into atomic and molecular, as above.

2.125121. Atomic structures in English include the subject with intransitive verb, the subject with intransitive adjective, and the subject with predicate classifier.

Examples of these are the following: 'John cried,' 'the grass is green,' and 'men are animals'.

2.125122. Molecular structures in English include the subject with transitive verb and object, the subject with verb and verb modifier, and the subject with combinations of these molecular predicate structures and the atomic predicate structures.

Obviously in English there are many subtypes of molecular predicate structures, of increasing complexity. Examples include the following: 'John laughed and cried,' 'John cried bitterly,' 'John hit the ball,' 'John is a mortal man,' and 'John went to town'.

2.1255. The predicate formations may be non-syntactical in character.

2.12531. In this case some linguistic indicators, such as stress, which are not syntactic, and thus not considered part of grammar, identify and construct the predicate.

The sentence 'three men went to Monrovia,' with the stress on 'Monrovia,' has an atomic subject and a molecular predicate. The predicate 'three men went to' is indicated by exclusion from the subject.

2.125311. These indicators have particular reference to content, and thus serve to indicate the predicate where it is not identical with the grammatical predicate.

2.125312. These indicators have a structure for each language, and this structure must be learned and explained.

2.12532. In order to determine the structures of non-syntactic predicate formations, it is necessary to identify the subject, where it differs from the grammatical subject, and from that to identify the predicate by complementation.

Thus in the sentence 'he ate pepper with his soup,' the subject is 'pepper' and, by complementation, the predicate is 'he ate....with his soup.'

2.12533. Non-syntactic predicate formations can be classified into atomic and molecular.

If I say 'the city is Monrovia,' then the subject is 'Monrovia,' and the predicate is 'the city', which is atomic. If I say 'he ate pepper with his soup,' the subject is 'pepper' and the predicate is 'he ate....with his soup,' which is molecular.

2.125331. Atomic structures assert of the subject a single fact within one of the categories by which to describe fields of attention: content, form, aspect, measure, value.

2.125332. Molecular structures include the subject with two or more attributes, from one or more of the above categories.

2.126. It is necessary also to determine how predicates are connected with subjects, as well as, in the case of molecular predicates, how their parts are connected.

2.1261. We consider first the way in which the subject and predicate are connected.

2.12611. This may be a property of the structure of the language, in which case the connectives are grammatical in character.

2.126111. In this case we make the assumption of the identity of the predicate and the grammatical predicate.

2.126112. A simple case of this occurs when the connective is the zero-connective and position alone indicates subject and predicate.

For instance, if we say 'John hurt Flumo', we distinguish this statement from 'Flumo hurt John' simply by the position of the words involved. In a language such as Latin, the position does not indicate the words, however, and thus this simple case is not always possible.

2.126113. A more complex case is where there are morphemes which indicate the connection of grammatical subject to grammatical predicate.

In the sentence 'John is a man', the word 'is' does not function as an attribute, but merely as connective. In such languages as Latin, the object of the verb is indicated by a case ending, which likewise functions as a connective.

2.12612. The subject and predicate may be connected by non-syntactical, content-centered devices.

2.12611. Such devices are required when the subject is not the grammatical subject,

Such an example is the sentence 'John ate the pepper,' where the grammatical subject is John, but the subject is 'the pepper'.

2.12612. The subject may be indicated by intonation, stress, pauses, or other phonemic devices.

2.12613. The subject may be indicated by the context in which the proposition is placed.

2.12614. In all these cases the predicate can be defined as all that remains of the atomic proposition after the subject is removed.

2.12615. That which connects the subject and the predicate in these cases is part of the predicate, according to this definition, but cannot be defined in a precise syntactical way.

2.1262. We must consider next the ways in which the portions of a molecular predicate can be connected.

2.12621. This may be a property of the structure of the language, in which case the connectives are grammatical in character.

2.126211. We do not necessarily assume in this case that the predicate and the grammatical predicate are the same, since we are only concerned with that in the atomic proposition which is the complement of the subject.

2.126212. It may be that the connections are indicated by word order, with the zero-connective joining the terms.

For instance, the two sentences 'I painted the green house,' and 'I painted the house green,' are different because of word order. In the first case we do not know the color of the house after it was painted, whereas we do know that color in the second case.

2.126213. It may also be that the connections are indicated by morphemes.

2.1262131. Some of these connection-indicating morphemes may also indicate a certain content, and thus suggest an attribute.

For example, 'I see a snake next to you', has a connection-indicating morpheme in 'next', which also indicate a certain spatial relation, and thus has content.

2.1262132. Some of these connection-indicating morphemes, on the ~~hand~~, may only indicate connection-patterns without adding information about the content.

To say "this is a lot of men", uses the word 'of' without indicating any additional content beyond the men and the amount.

2.126214. It is necessary in all these cases to analyze the various structures possible within the language.

2.12622. The connections of the portions of a molecular predicate may be non-syntactical, and indicated by a content-centered device.

2.126221. Those devices may involve intonation, stress, pause and gesture.

2.126222. They may involve the uses of the context of the proposition.

2.12623. We must look for different connectors for two alternative cases: where the molecular predicate is composed of words of the same content-centered class, and where it is composed of words of different content-centered classes.

2.126231. In case the attribute-names in the molecular predicate are of the same content-centered class, the connectors can be called coordinate predicate connectives.

For example, in the sentence 'I ate a pineapple and a banana', 'pine apple' and 'banana' are words of the same class, and the connector 'and' is a coordinate predicate connective.

2.126232. In case the attribute-names in the molecular predicate are of different content-centered classes, the connectors can be called correlating predicate connectives.

In the sentence 'I ate a banana quickly', 'banana' and 'quickly' are of different content-centered classes, and the zero-connective, as well as the position in the sentence, are thus correlating predicate connectives. In the sentence 'I have two boxes of books', 'books' is a content-name for the field of attention, 'boxes' is a presentation-name, and 'two' is a value-name. The aspect and measure-names are, of course, merely implied. In this case the connective 'of' is a correlating predicate connective.

2.2. Molecular propositions are propositions which have at least one complete atomic proposition as a unified, proper, sub-portion of themselves.

Thus, the sentence 'I saw two men and I spoke to them', is a molecular proposition, since the proposition 'I saw two men' is a unified, proper, sub-portion of the original proposition. However, 'I saw two men' is not a molecular proposition, since no unified, proper, subportion can itself be a proposition. It is not proper to say, in this case, that 'I saw men' is a unified, proper, sub-portion of the original proposition, since it is not a part of the original, which as a whole is modified by the value 'two'.

2.21. A unified, proper, sub-proposition is a proposition which is retained as a whole in the molecular proposition, and then modified as a whole.

The examples under 2.2 show this clearly. 'I saw two men' is a unified, proper subproposition, since it is retained as a

whole in the proposition 'I saw two men, and I spoke to them.'

2.211. Thus internal modifications are not allowed, since these do not change an atomic proposition into a molecular proposition, but merely make it into a new atomic proposition.

'I saw men' and 'I saw two men' are simply different atomic propositions.

2.212. In this way we can clearly distinguish between transformations which modify propositions in a basic structural way and those which modify them in a merely internal way.

'I saw men and horses' is structurally different from 'I saw men and I saw horses', since the former is atomic and the latter molecular.

2.22. Molecular propositions can be either simple or complex.

2.221. The simple molecular proposition has only one atomic proposition which ^{is} unified, proper subproposition.

An example of this would be the proposition 'John is not tall', which has 'John is tall' as a unified, proper subproposition. That this is the case can be seen more clearly by writing 'John is not tall' in the form 'it is not the case that John is tall'.

2.2211. The simple molecular proposition is formed from the atomic proposition with some marker modifying the whole atomic proposition

2.22111. In this case the molecular proposition is in fact a proposition which asserts some predicate of a subject which in turn is itself an atomic proposition.

The example under 2.221 can be rewritten still further as 'John is tall' is a false proposition.' In this case the subject of the molecular proposition is 'John is tall'.

2.22112. Thus the simple molecular proposition must be a proposition concerning a proposition, a proposition whose own essential form is atomic.

In the example above the form of the proposition 'John is not tall' can be reduced by transformation to '_____ is false', where the blank is to be filled by another proposition. Another such example might be 'John is tall' contains three words,' which is a proposition about a proposition.

2.2212. The most important special case of this in English is the case of negation, which is an operation performed on another proposition, which can thus be transformed into the two forms, 'it is not the case that _____' and '_____ is false.'

2.2213. However, any atomic proposition which asserts some predicate to be the case for another proposition as subject can form a simple molecular proposition.

2.222. The complex molecular proposition has at least two atomic propositions as proper, unified subpropositions within it.

That 'I saw two men and I spoke to them' is a genuine molecular proposition, since it can be broken into the two unified, proper subpropositions 'I saw two men' and 'I spoke to them' with the connective 'and'.

2.2221. These subpropositions must be stateable separately, and none of them must involve the others as a part of itself.

This is certainly the case with the example under 2.222, but is false for the example under 2.221.

2.2222. We must ask first the question of the connective joining two propositions.

2.22221. This connective may be grammatical in character.

2.222211. It may be a connection indicated by position in the proposition, so that it is a matter of structure and pattern, without additional morphemes.

In the sentence 'I saw the man you saw yesterday', there are two unified, proper subpropositions, 'I saw the man' and 'you saw yesterday'. Of course, the object of the second 'saw' is implied, and thus the second 'saw' is transitive and not intransitive, as would appear to be the case in its separated form. Thus the sentence pattern alone indicates a connection between the two propositions, and supplies an implied object for the second proposition.

2.222212. The connection may be indicated by a morpheme in the sentence.

2.2222121. In one case this morpheme may be a separate lexeme marking off the two propositions and indicating the kind of connection.

In the sentence 'I saw two men and I spoke to them', the word 'and' is a lexeme connecting the two propositions in a parallel, coordinate way.

2.2222122. In another case the morpheme may be a marker attached to certain of the terms in the propositions.

This pattern appears in the consecutive construction in Kpelle, where the verbs in the second proposition have their tone altered to indicate the connection.

2.22222. The connective may be a non-syntactical, content-centered device.

An example of this might be 'I saw Flumo; he owes me money.' In this case the propositions are separate, but the stress on 'he' joins them together more intimately than they would be simply as two separate propositions with the related content.

2.222221. This joining may involve intonation, stress, pause or gesture.

2.222222. This joining may involve only the context.

2.222223. The connective may be both grammatical and content-centered (which is probably the most common situation in English, for example), where the grammar indicates the structure and the content indicates the truth value of the joint proposition.

2.222230. In English, the conjunction 'and' indicates the joining of the propositions into a new proposition, the truth of which requires the truth of both the component propositions.

The proposition 'I saw two men and I spoke to them' is true if and only if its component propositions are both true. Otherwise it is false, if and only if either of its component propositions are false.

2.222232. The propositions may be joined by 'or' to make a new proposition, the truth of which requires the truth of at least one of the component propositions.

For example, 'I will eat breakfast or I will be hungry' is false if and only if both parts of it are false. If one or the other part is true it will be true. And it might be the case that my breakfast is so small that I will remain hungry, in which case the proposition will be true when both parts are true.

2.222233. The proposition may be joined by a number of devices which indicate that one is the reason for the second, and that the second, therefore, is the result of the first, in which case the resultant proposition is false if and only if the antecedent is true and the consequent is false.

For example, in the proposition 'if I eat breakfast, then I will be full,' it is possible for each subproposition to be true or false. The molecular proposition is true unless 'I eat breakfast' is true, and 'I am full' is false, in which case the molecular proposition is false.

2.2222331. The syntactic devices which show this connection in English include 'if... then,' 'therefore,' 'because', and so forth.

2.2222332. The formal logical connector in this case is 'implies'.

Thus the proposition under 2.222233 can be written as follows:
'I eat breakfast' implies "I will be full" .

2.222234. The propositions may be joined by a connective which indicates that the two are equivalent to each other, in which case the new proposition is true if and only if the joined propositions are simultaneously true or simultaneously false.

To take a very simple example, we can say the following: ' "my name is John" is equivalent to "John is my name" .'

2.222235. There may be other ways of connecting propositions to form complex molecular propositions in English, and it is necessary to determine as complete a set of these connectives as possible.

2.2222351. The important type of connective is that which combines truth-content and grammatical structure.

2.2222352. However, it is also important to consider and analyze those connectives which do not have truth-functional content.

2.2222521. The connective 'it is possible that', which forms a simple molecular proposition, can be shown not to be a truth-functional connective.

2.2222522. The connective 'but' can in one sense be considered equivalent to the connective 'and', but in another sense can be considered different, and this difference cannot be expressed as a truth-functional connective.

2.2222523. The analysis of connectives which do not have truth-functional content, in the formal logical sense, is difficult, but nonetheless important to a full analysis of linguistic usage.

2.23. In order to determine the connectives it is necessary to list as many types of molecular propositions as possible.

2.231. From the propositions, the structures can be abstracted and systematized.

2.2311. The atomic propositions must first be identified and marked off as separate.

2.23111. The structure of these atomic propositions must be listed and analyzed.

2.23112. The connectives in atomic propositions must be listed and analyzed.

2.2312. Then the methods of forming simple molecular propositions must be listed and analyzed.

2.2313. Then the methods of forming complex molecular propositions must be listed and analyzed.

2.232. The truth-values of the propositions must then be determined by analyzing the truth-values of the atomic propositions which go to make up the molecular propositions, and relating these truth-values to those of the molecular propositions.

2.2321. The truth-values of the atomic propositions must be given by informants within the language and culture.

2.2322. It may be that certain structures display a different pattern of truth-value depending on the content of the atomic propositions.

An example of this is the case of the connective 'it is possible that' in English.

2.23221. In this case, we say that the connective does not have truth-functional value.

2.23222. We must then try to distinguish equivalence classes of atomic propositions, for all of which the connective behaves in the same way.

Thus in the case of the connective 'it is possible that', we can find one equivalence class consisting of atomic propositions which are not a priori possible or impossible, and another equivalence class of atomic propositions which are a priori possible or impossible. Each sub-class of atomic propositions will then display uniform behavior for the connective.

2.2323. In this way a logical organization of the connectives can be given, and a logic developed for the given language.

2.23231. This logic has been developed for languages in the European tradition.

2.23232. It is to be expected that the logic will be the same for all languages, but this has not yet been demonstrated for non-western languages.