2.1.6. Logical forms

We will conclude this first look at analysis by considering its results in more general terms. The aim of analysis is to uncover logical form. While it is natural to speak of the result of an analysis as *the* logical form of the sentence that was analyzed, a sentence will usually have many logical forms of differing complexity. Many of these may be displayed as we carry out an analysis step by step. Consider, for example, the following analysis of a fairly complex sentence:

He went to Gary, South Bend, and Fort Wayne, leaving at dawn and returning after dark

He went to Gary, South Bend, and Fort Wayne ∧ *he left at dawn and returned after dark*

(*he went to Gary and South Bend* ∧ *he went to Fort Wayne*) ∧ *he left at dawn and returned after dark*

((*he went to Gary* ∧ *he went to South Bend*) ∧ *he went to Fort Wayne*) ∧ *he left at dawn and returned after dark*

((*he went to Gary* ∧ *he went to South Bend*) ∧ *he went to Fort Wayne*) ∧ (*he left at dawn* ∧ *he returned after dark*)

$((G \land S) \land F) \land (L \land R)$

`both both both` G `and` S `and` F `and both` L `and` R

[F: *he went to Fort Wayne*; G: *he went to Gary*; L: *he left at dawn*; R: *he returned after dark*; S: *he went to South Bend*]

The first line exhibits the sentence without further analysis, the second shows it as a conjunction, the third as a conjunction whose first component is a conjunction, and so on. Each line ascribes a form to the sentence, and if we ignore the identity of unanalyzed components, this is a form that the sentence shares with many other sentences. These abstract forms are indicated below (in the order in which they appear in the analysis) with symbolic notation on the left and a description of the form on the right:

φ	sentence
$\psi \land \chi$	conjunction
$(\zeta \land \xi) \land \chi$	conjunction of (i) a conjunction and (ii) a sentence
$((\mu \land \nu) \land \xi) \land \chi$	conjunction of (i) a conjunction whose first component is a conjunction and (ii) a sentence

$((\mu \wedge \nu) \wedge \xi) \wedge (\theta \wedge \upsilon)$	conjunction of (i) a conjunction whose first component is a conjunction and (ii) a conjunction

The sentence has still further forms that might have appeared in the course of our analysis if we had reached the final result in a different way. One example is $\psi \wedge (\theta \wedge \upsilon)$, a conjunction of (i) a sentence and (ii) a conjunction.

It is important to recognize all the different forms a sentence has, even those that correspond to very partial analyses of it. Each represents a class of sentences that may share important logical properties with the sentence we are focusing on. For example, the sentence above will share some of its logical properties with all sentences, others with all conjunctions, still others with conjunctions whose first components are conjunctions, and so on.

We will apply the term ***component*** to any sentence that appears on any level of analysis of a given sentence. In particular, a sentence is a component of itself. We will distinguish the components of a compound to which its main connective applies as its ***immediate*** components, and we will refer to those that appear unanalyzed at the last stage of an analysis as its ***ultimate*** components (on that analysis). We will often refer to the ultimate components of a sentence also as ***unanalyzed***. In the example above, the immediate components of the initial sentence are the two sentences separated at the second line of the analysis; the ultimate components are those abbreviated with capitals at the end. Although, in principle, both roman capital letters and the lower case Greek letters may stand for any sentences, in practice, we will reserve capital letters for sentences we do not analyze further. Such sentences are ultimate components of themselves and of any larger compounds in which they appear.