CONCLUSIONS

1 SCOPE

The primary objectives of this study, as a whole, have been the following:

(1) To develop a General Theory of SIL; and
(2) To substantiate the "generality" of the developed theory.

The presentations up to Chapter M are all devoted to these overall objectives. But each Chapter has its own specific objectives contributing to the achievement of the overall objectives. This relationship between the overall objectives and the specific objectives has made it necessary to make each chapter self-conclusive. Therefore, no attempt is made here to elaborate those conclusions in this chapter. On the contrary, only the essence of those conclusions are referred to in this chapter.

Besides, having made all relevant efforts to achieve the overall objectives, it seems quite reasonable to take note of the logical consequences of the process of reasoning employed for the whole study. These logical consequences are not, indeed, explicitly spelt out in
earlier chapters in all cases; they are to a large extent implied. But, from a theoretical point-of-view, they are of considerable significance. Therefore an additional attempt is made here to spell out those logical consequences of the process of reasoning employed for the study as a whole.

2 NEED FOR A STRUCTURAL THEORY OF SIL

In relation to natural languages, a structural theory of linguistics is an essential prerequisite to their study from the philosophical and psychological points-of-view. This hypothesis is now confirmed and well established by the results of theoretical research in the field of natural languages (25). A SIL is an artificial language depending heavily on a natural language. From the philosophical point-of-view, we are interested in its relation to logic. Therefore, the study of SILs from the philosophical point-of-view, naturally calls for a structural theory of SIL.

3 THE ESSENCE OF THE STUDY

The study embedded in this document owes its origin to the realization that a structural theory of SIL is an essential prerequisite to the study of

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SILs from the point-of-view of their relation to 
logic. For the purpose of this study, a methodology 
has been developed by consolidating the pertinent 
essentials of philosophical logic; and it has been 
designated as the "Logical Forms-Approach". An 
operational definition of the Logical Forms-Approach" 
has been formulated for its application. Using this 
methodology, the structures of four outstanding SILs 
-- namely, those of Cutter, Dewey, Kaiser, and 
Ranganathan -- have been analyzed; and their 
regularities identified. The commonalities among the 
identified regularities have been consolidated to 
develop a general structural theory of SILs by applying primarily the process of logical abstraction; 
and it has been designated as a General Theory of SIL. 
To measure the degree of generality of the General Theory of SIL, the following criteria have been con-
sidered:

(1) Its capability of explaining the existing 
Practices; and

(2) Its capability of serving as a source for 
deriving new consistent practices to meet 
new demands, or to meet old demands more 
efficiently and effectively.

To show its capability of explaining the existing
practices, the structures of each of the outstanding SILs have been "logically interpreted" in terms of the elements, modifiers, and relations of the General Theory of SIL. To show its capability of serving as a source for developing new SILs, POPS (Basic) has been developed quite in conformity with the General Theory of SIL; and it has been demonstrated how POPS (Basic) can be manipulated to develop a new specific purpose-oriented SIL. The latter has been designated as POPS (Specific).

4 ESSENCE OF CONCLUSIONS.

Some of the conclusions that have emerged from the results of the study, may be enumerated as follows:

1) The different SILs are not isolated and individual phenomena. They are all developments within the general framework of a system of elements and relations which determines their respective structures.

2) The general framework of a system of elements and relations is the Deep Structure of SIL developed by a logical abstraction of the structures of the different outstanding SILs.

3) The structure of any specific purpose-oriented SIL for precoordinate indexing is a derivative of the
Deep Structure of SIL; and it is derived through one or more manipulation techniques — such as, the following:

(a) Decisions about the Base and the Core;
(b) Rules for eliminating redundant elementary categories;
(c) Rules for eliminating redundant manifestations;
(d) Rules for analyzing categories;
(e) Rules for merging categories;
(f) Rules to ensure compromising economy;
(g) Decisions about the styles of presentations of subject-propositions;
(h) Decisions about the terms-of-approach;
(i) Decisions about reversing the "Basic Sequence".

The SILs designed by Cutter, Dewey, Kaiser, and Ranganathan are examples of specific purpose oriented SILs. This is a direct evidence of the "generality" of the General Theory of SIL.

(4) POPS1 (Basic) is a new SIL developed in total conformity with the Deep Structure of SIL. This is another direct evidence of the generality of the General Theory of SIL.

(5) Any POPS1 (Specific) is a derivative of POPS1 (Basic). This is still another evidence of the generality of the General Theory of SIL.
Besides the essence of conclusions enumerated above, some other logical consequences emerge out of the reasoning employed for the study as a whole. From the theoretical point-of-view their significance is quite considerable. Hence they are furnished in the following sections.

5 SIGNIFICANCE OF THE STRUCTURAL THEORY OF SIL

In the case of a SIL its actual usage represents the "real" and "observable". Therefore, in its study, we can rely strictly on what is perceptible, and can base our hypotheses on facts which can be held to be objective. This fact brings the whole basis of the study of SILs into question: "If one could study a SIL on the evidence of directly observable, what is a SIL itself? Is a SIL nothing but a totality of all the subject-propositions (names-of-subject) produced according to its grammar?" Methodologically, this question leads to the recognition of the structure of the SIL; and provides a basis for the study of the SIL as a system.

In this sort of study, the questions that become the centre of theoretical interest are:

(1) How is an individual SIL constructed? and
(2) How must it be described?

Answers to these questions call for the recognition of components of the linguistics of the SIL as an essential prerequisite. Seen in this way a SIL is not merely a collection of subject propositions, but consists of a system of elements and relations underlying those propositions. In other words, a SIL is the totality of all resources which determine the structure of its individual subject-propositions. In that case, its elements do not possess any physically describable substance; they are rather abstract existents; and the relations between or among them can be realized with a considerable breadth of variation. What is important of each element is its particular function or value that it has according to the grammar of the SIL. Viewed from this angle, a SIL is a system of values, and not merely a collection of items defined by their substance.

Again, SILs are systems of signs, and have essential features in common with other sign systems. The linguistics of a SIL has a special place within the general theory of signs which is generally called "Semiology".

A SIL is a system of classes within which the
signs delimit and specify each other. The relations among items of a class is called semantic relation. Compound and complex subject-propositions are formed by combining two or more components. Each component has its specific function or value. Depending upon their functions or values the components of compound and complex subject propositions fall in a few distinct mutually exclusive categories. This fact draws attention to the elementary structure of a SIL. The relation between two components — real or potential — falling in the same category is called elementary relation. Elements of different categories are combined to form compound and complex propositions. The relation between two distinct elements in a compound or complex subject proposition is called syntactic relation. Corresponding to each type of relation we can recognize the semantic structure, elementary structure, and syntactic structure of subject-propositions.

6 GRAMMAR OF SIL

The formal structure of a compound or complex subject-proposition may be called a "Chain". A chain is formed out of elements and relations of the underlying linguistic system. While the system
is the grammar, the subject-propositions are the chains. A chain may be of semantic relations, and of syntactic relations. A semantic relation may manifest as a whole-Part relation; or as a Whole-Type (Genus-Species) relation. The syntactic relation manifests as the interface relation. A modulated chain combines in it both semantic relations, and syntactic relations.

The General Theory of SIL centres round the following essential observation: Whoever formulates a subject-proposition does not simply carry around his head a long list of terms and subject propositions which he has stored, but is able to form new subject-propositions, and to understand others he has never seen before. The command of a SIL is thus a productive capacity, not merely the knowledge of an extensive nomenclature. The linguistic knowledge that is involved in formulating subject-propositions of a SIL, is its grammar which also includes the pertinent vocabulary.

Every subject-proposition consists of a finite number of basic elements and has a particular structure. Every subject-proposition can be actually realized any member of times under concrete conditions. The set of subject-propositions of a SIL, in a strictly
theoretical sense, is infinite, although every subject-proposition consists of a finite number of elements. Whether a subject-proposition is correct, depends solely on whether its structure corresponds to the grammar of the SIL concerned. Ideally, a SIL should aim at covering an infinite set of potential subject-propositions by a finite system of basic elements and combinatory rules. The grammar of a SIL, therefore, means a system of rules capable of precise formulation, which when applied repeatedly, generate all the subject propositions of the SIL. It is a logical system which specifies which combinations of elements may be formed.

Each subject-proposition must be specified by a concrete and abstract representation of the syntactic structure; and by its semantic structure. All the three levels of representation of a subject-proposition taken together is its structural description. A grammar of a SIL can then be a mechanism which generates a set of structural descriptions.

Analysis of various SILs has shown that the deep structures, despite differences between structural types, have essential properties in common. One could understand the semantic structure of subject-propositions if one knew the meaning of the terms, and guessed the
deep structure. This leads to the assumption that the basic elementary categories — namely, Discipline, Entity, Action, and Property — and their functions may be regarded as the "universals" of SILs.

7 A SIL AND A NATURAL LANGUAGE

There is a distinct difference between a SIL and a natural language, especially from the point of view of users of a SIL. The specific purpose of grouping behind a SIL calls for a grammar of its own quite distinct from that of any natural language. The communicator in a natural language, as well as his communicatee have to be thorough with the grammar of the natural language concerned for the sake of successful communication. On the other hand, the formulator of subject-propositions alone has to be thorough with the grammar of the SIL concerned. The user of subject-propositions (communicatee) are expected to be least concerned about the grammar of the SIL. The subject propositions are expected to be formulated in such a way that (1) on the one hand, it should serve all or a selection of its purposes; and (2) on the other, the users knowledge of his natural language, and his "common sense" should be adequate to understand each subject proposition. From the point of view of
of the user, a formally structured subject-proposition is a deviation from the regular structure of his natural language; but, it is comprehensible to him provided it admits of the right interpretation by analogy with some logical structure known to him. Some kind of knowledge of logical forms, though with most users it is not explicit, is involved in all understanding of subject-propositions. For example, a subject-proposition like "Lungs, Diseases" is understood to denote "Diseases of Lungs"; for it admits of right interpretation by analogy with the logical structure of the two concepts.

Obviously, to satisfy these conditions, a SIL to be efficient and effective, has to take extraordinary burden which gets reflected in some extraordinary features. One such feature is that for every query in a user's mind, a SIL is expected to lead him to a point where it displays a pattern which, among various purposes, serves as a mechanism to "enlighten" him instantly about the logical form he needs to know for the understanding of subject-propositions. The terms and their relations of a query may deviate from those of the subject proposition of a SIL, but it must entertain it and provide aids to reformulate it according to its formal structure.

The user knows a set of terms. With a particular
term in mind, he approaches the index. He finds a match and stops there. The features of the index have led him to the match. At the match-point, the user sees the subject propositions, many of which are combination of terms. The term combinations display a regularity which the user deduces instantly; and thus he learns the grammar of the SIL concerned in his own way. With this knowledge he explores the set of subject-propositions having his matched term in common; and selects those which he feels to be relevant to his information need. The subject-propositions also provide him with other leads through references. These referred to propositions may be relevant to his need though they do not contain his matched term. After the purpose is served, the user can easily afford to forget the "impression" of the grammar of the SIL that he gained; for, the SIL takes the responsibility of offering him the necessary "impression" instantly as and when he consults the index. In this sense, a SIL differs from a natural language considerably.