

INTEGRATIONAL LINGUISTICS AS A BASIS FOR CONTRASTIVE STUDIES

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1. Theoretical problems for complex contrastive analysis.

1.1. Requirements for contrastive analysis.

In 1972, Slama-Cazacu characterized 'the usual contrastive linguistic study' as 'consisting in establishing, *in abstracto*, the similarities and differences between the two systems', and forcefully argued that this was not enough:

If contrastive linguistic analysis is to survive it must acquire a fresh image: ideally it will be a complex, multidisciplinary study, based on sound scientific principles and utilizing empirical methods of investigation, and it will have a clear theoretical background deriving from foundational research. Psycholinguistic investigations will play a key role in this study since it is vital to give due regard to the concrete realities represented by the language learner and the learning-teaching situation. Further important contributions to the study will be made by the linguistic analysis proper and by sociolinguistics, pedagogics and developmental psychology.¹

At the time, contrastive analysis (CA) had been meeting with increasing scepticism.² Slama-Cazacu's statement is remarkable not for supporting this scepticism but for succinctly summarizing the requirements that should

¹ Slama-Cazacu (1974: 236f and 235).

² The titles of James (1971) (*The exculpation of contrastive linguistics*) and Di Pietro (1974) (*Contrastive analysis: demise or new life*) are indicative of the situation. That it has not entirely changed can be seen from Sanders (1976), which is written in a spirit similar to James (1971). Critical voices were raised already in Alatis (ed.) (1968): Hamp (1968), Lee (1968); and Nemser and Slama-Cazacu (1970) were particularly outspoken. Objections to CA were raised both on practical grounds (doubtful relevance to the language teaching context) and for theoretical reasons (too narrowly linguistic, among others).

be met for improving the status of CA. Her own proposal is for a 'contact analysis of the two systems in the learner' (1974 : 238).³ 'Contact analysis' may well be one of the most interesting conceptions put forward in contrastive linguistics, still, not everybody may wish to subscribe to it. In any case, Slama-Cazacu's general requirements for 'contrastive linguistic analysis' seem to define a standard that should be met.⁴

In the present paper I shall be concerned with four theoretical problems that arise in any attempt to meet Slama-Cazacu's requirements for CA.

1.2. Four problems for complex contrastive analysis.

The first problem is raised by the conception of CA as 'a complex, multidisciplinary study':

(1) *Problem of the linguistic and the non-linguistic.* If we wish to derive consequences from linguistic and non-linguistic results (psychological ones, sociological ones etc.), we must be able to combine those results in a single theoretical framework allowing for deductions. How is such a framework to be conceived?⁵

³ A characteristic feature of 'contact analysis' is the assumption of 'approximative systems' developed by the second-language learner (cf. also Nemser 1971, Nemser and Slama-Cazacu 1970, Nemser 1975), an idea supported in Kufner (1973), and independently suggested, with some differences, in Selinker (1969, 1972) ('interlanguage'), Corder (1967, 1971) ('idiosyncratic dialects', cf. also Corder (1973 : 268ff)), and James (1972) ('interlingua'). Use of 'approximative systems' by now tends to be generally accepted; cf. e.g. Barrera-Vidal and Kühlwein (1975: Sec. 6.3), Ebnetter (1976: Sec. 10.1), Corder (1976), Hanzeli (1976).

⁴ It is noteworthy that Lado (1957) envisaged a 'systematic comparison of languages and cultures [my emphasis] (title of Ch. 1). Di Pietro again argues (1974 : 76) for inclusion of 'sociological and cultural factors'. Kufner (1973) endorses a position similar to the one of Nemser and Slama-Cazacu (1970): contrastive grammars should be transformed into 'pedagogical' ones that combine 'linguistische Betrachtungsweisen mit psycho-pädagogischen'. Bausch (1973 : 175) also supports 'contact analysis'. Zimmermann (1974) suggests inclusion of 'pragmatic' (speech act) considerations. Barrera-Vidal and Kühlwein explicitly advocate a 'contrastive pragmatics' (1975 : 122). The need for 'a clear theoretical background' has been emphasized by a number of authors. Thus, Nickel states of all contributors in Nickel (ed.) (1971 : I. IX) that they 'seem to be in agreement on one point of methodology: that one and the same approach should be used within one and the same investigation'; cf. also Nickel (1971 : 5), and many of the authors mentioned below, fn. 11.

⁵ The problem is well exemplified by the way in which Lado (1957) suggests to include cultural data into CA. He proposes a 'comparison of cultures' (Ch. 6) in addition to a comparison of languages but fails to indicate how the two might be systematically related. I do not know of any explicit answer to (1) as a general theoretical problem. (The standard move in generative grammar — relegating most of the non-linguistic to a 'theory of performance' — is unsatisfactory for at least three reasons: so far, there is

The second problem arises by considering individual language learners in their actual situations:

(2) *Problem of concreteness.* Suppose that we wish to use a contrastive study in partial explanation or prediction of the language learning behaviour of specific learners. We must then be able to relate the study both to their behaviour and to other, possibly unique facts relevant to the explanation or prediction. How can such a relation be established in a way that is not entirely ad hoc?

Indeed, it is this problem that should be at the root of much criticism of traditional CA.⁶ Such criticism has tended to emphasize the seeming irrelevance of CA to explaining or predicting the errors made by specific language learners.⁷ The 'usual contrastive linguistic study', being a study of language systems in abstracto, does not answer the question how its results may be related to specific learners in their unique situations: we do not really know how to apply the analysis.

The third theoretical problem consists in dealing adequately with the fact that no language is absolutely unique:

(3) *Problem of the general and the particular.* In contrasting several language varieties we should in principle be able to single out those properties which the languages or varieties share for reasons of universality, or which they share or do not share for typological reasons. How can this be achieved? In the formulation of (3), reference to language varieties (dialects, sociolects etc.) was deliberately included. It obviously is 'one of the concrete realities represented by the language learner and the learning-teaching situation' that languages are represented in form of language varieties, that is, CA should take the internal variability of languages fully into account.⁸ With respect to varieties, the problem of the general and the particular has, so to speak, one additional layer: we should also be able to single out those properties which the varieties share or do not share because they are varieties of specific languages.

There is an extensive discussion already in traditional CA on how CA is

no such theory; it is notoriously unclear how such a theory should be related to a grammar; and the very distinction between 'competence' and 'performance' has been thrown into doubt.)

⁶ See above, fn. 2. I shall use 'traditional CA', somewhat arbitrarily, to refer to the type of CA that is mainly concerned with purely linguistic comparisons.

⁷ Catford (1968 : 159) suggests that 'the function of contrastive analysis or descriptive comparison in language teaching is explanatory rather than predictive'. But this must be a spurious contrast, given the largely symmetrical relation between explanation and prediction, which differ mainly in their temporal aspects.

⁸ This is recognized, for instance, in Di Pietro (1974) and emphasized in Levenson (1971 : 277).

related to the study of language universals and, to a lesser extent, on how it is related to language typology.⁹ A solution to problem (3) is clearly necessary if CA is to have 'a clear theoretical background deriving from foundational research'.

The fourth problem has also been recognized in traditional CA in the following restricted form:

(4) *Problem of the metalanguage: restricted form.* For formulating contrastive statements about several languages or language varieties, we need a (meta)language in which we can adequately refer to any one of them. What kind of language is to be used?¹⁰

This problem is usually seen as finding a suitable 'model' or 'framework': Before we can contrast two languages, we need to establish a general framework (a 'model', to use the term now in vogue) within which both languages can be analyzed; only then can we effectively compare the two and note the two and note the contrasts between them.¹¹

⁹ Language universals are assigned a fundamental role in CA by Di Pietro (1971) (cf. esp. 3f and Sec. 2.5). Generally, authors who favor a 'semantically based' grammar (cf. below, fn. 11), tend to posit the universality of the 'semantic structures' (Krzyszowski 1973, Gatto 1974). Likewise, universal phonetics is seen as the basis for phonological contrastive studies (Kufner 1973 : 27; Corder 1973 : 255, but cf. 253). Conversely, the importance of CA for research on universals is also stressed (Ferguson 1968 : 101; Nickel (ed.) 1971 : X). In Coseriu's opinion, however, CA is concerned not with universals but only with 'das empirisch Allgemeine' (1970 : 30). Cf. also various contributions to Jackson and Whitman (eds) (1971) for attempts to relate CA to the study of language universals. CA is seen as relevant to typology already in Harris (1954 : 259); its relevance is emphasized in Coseriu (1970 : 19). Nickel (1975 : 39) subsumes 'questions of language typology and universals' under 'Contrastive Linguistics as a theoretical discipline'. For typology, this corresponds to the position in Trager (1950) (as argued by Bausch [1973 : 164], who draws attention to this paper as presenting 'the first model that was explicitly called 'contrastive' by its author'). Nemser and Slama-Cazacu (1970 : 108), on the other hand, insist on 'crucial differences between contrastive linguistics and comparative typology'.

¹⁰ Language varieties have been included for the same reasons as before. By 'adequately refer' I mean not only reference to a single language but the possibility to formulate any comparative statement that seems appropriate. This requires a metalanguage with the necessary terminology.

¹¹ Moulton (1968 : 27). Various proposals for a theoretical framework have been made: Harris (1954), generative in spirit if not in detail, was taken up by Wyatt (e.g. 1971); Krzyszowski (1972 and 1973) [Krzyszowski (1974) became accessible to me only well after this essay was finished] outlined a format for 'contrastive generative grammars' (for criticism, cf. Bouton (1976)); so did Di Pietro (1971), in much greater detail and on the basis of a modified version of Fillmore's 'case grammar'. Krzyszowski and, to a lesser extent, Di Pietro propose a 'generative semantics' type framework; similarly, Pusch and Schwarze (1975). 'Semantically based' grammars or analyses are also advocated by Corder 1973, esp. 243f, Burgschmidt and Götz (1973), Gatto (1974), Marton

Strictly speaking, discussion of 'models' goes beyond the question of which descriptive language to choose: directly or indirectly, the 'models' considered ('structuralist', 'generative transformational', or others) imply a general theory of language that is to supply assumptions on all languages. These assumptions provide the background before which two given languages are to be contrasted. This takes us directly back to the problem of the general and the particular. Deciding on a general 'model' can be seen as an attempt to give a joint solution to problems (3) and (4): the theory of language associated with the 'model' provides the universal (if not typological) assumptions needed in connection with (3), and it also provides terms for talking about any language, hence, for talking about the given ones.¹²

It is worth keeping in mind the idea that a theory of language may be basic to solving both problems (3) and (4) even if the suggested 'models' are not accepted. I would indeed claim that the problem of the metalanguage has not been adequately solved in any of the models, even in its restricted form. It is of course impossible to discuss this question here in detail. All I can do is briefly point to the inadequacies of at least one model, generative grammar.

Grammars in this model are generally beset by the problem of how an algorithm for generating formal objects can be understood as a theory of a natural language. Known solutions require a conception of a generative grammar as a 'one language grammar' in which symbols like 'S', 'VP' etc. refer to the sentences, verb phrases etc. of a single language.¹³

So far, actual or suggested CA within a generative framework has taken one of two forms:¹⁴ (a) comparison of different grammars, or (b) writing a single grammar that contains a single base and, in addition, either different

(1974), Dirven (1976). Technically the most advanced proposal for 'generative contrastive analysis' should be contained in Kohn (1974) (characterized in Kohn (1976)). Structuralist frameworks continued to be used or proposed even in the heyday of generative grammar (cf. Snook (1971) for stratificational grammar, Liem (1974) for tagmemics). Mach and Machova (1974 : 171) suggest 'a certain type of dependency grammar as conceived by the Prague Linguistic School'. Moulton (1968) attempts a synthesis of a number of conceptions.

¹² Such a position is implicitly taken in Di Pietro (1971) (cf. e.g. 4, 17, and the proposed format for contrastive descriptions). It also underlies the negative conclusion reached by Corder who, finding universality only in semantics and phonetics, submits (1973 : 255) that 'between the message and its physical expression in sound, there is a fundamental lack of common categories and relations available for really adequate comparison between two languages'.

¹³ For a detailed demonstration, cf. Lieb (1974: Sec. 1).

¹⁴ A third form — generating one language on the basis of a grammar for the other (Harris (1954)) — was again considered by Di Pietro (1971: Sec. 2.3) as a theoretical possibility but may here be disregarded.

subparts to correspond to different languages,¹⁵ or a single part to take account only of the differences between languages.¹⁶

Contrastive analysis according to (a) disregards the ambiguity of symbols like 'S' (which ambiguously refer to categories of different languages).¹⁷ Moreover, CA of this type falls back on everyday language for formulating its contrastive statements about grammars (which do not belong to any single grammar). Finally, it is unclear how such statements on grammars are to be translated into contrastive statements on languages.

Contrastive analysis according to (b) assumes an interpretation of the base symbols that makes them applicable to any of the languages involved. So far, such interpretations have been restricted to informal hints; and it remains unclear whether the problem of the 'one language grammar' is solved. The contrastive statements again raise problems. Either they do not belong to the grammar, and we are confronted with the same situation as in case (a).¹⁸ Or they are to be generated by the grammar (apparently Krzeszowski's position), which requires an algorithm of a novel and not yet specified kind. Or they are to be taken as rules of the grammar (apparently Di Pietro's position), which introduces rules of a novel and not yet clarified format.¹⁹

The problem of the metalanguage is aggravated if we also wish to solve problems (1) to (3):

- (5) *Problem of the metalanguage: expanded form.* For a complex contrastive analysis, we need a (meta)language in which we can adequately refer to
- a. any of the languages or varieties that are being contrasted;
 - b. any relevant type of languages, and language in general;

¹⁵ Wyatt (1971); apparently also envisaged by Krzeszowski (1972, 1973); included in the conception of Kohn (1974, 1976), which does not, however, require a common base.

¹⁶ Di Pietro (1971: esp. 30). Nickel's suggestion of a 'differential grammar' (1971: 9) seems to be compatible with either (a) or (b) in its second form.

¹⁷ The ambiguity is noticed, and recognized as a problem, by Whitman (1970: 192; for 'sub-sentence units', i.e. symbols, like 'N'). Cf. also Kohn (1974: esp. 50; 1976: 127).

¹⁸ This remains true of the most sophisticated proposal for a contrastive analysis according to (b), the one presented in Kohn (1974, 1976). Kohn assumes, in addition to the grammar, a special 'contrastive description' that contains a set of 'contrasts' as a component.

¹⁹ In both forms of (b) it is necessary to explicitly introduce names of the various languages, for obvious reasons. In Wyatt (1971), such names seem to have the status of indices to category symbols, which is formally unobjectionable. Kohn (1974: 55ff, 1976: 130ff), systematically uses indices to rules for representing language names. The status of the language names is unclear in Di Pietro's example for a rule that might serve for a contrastive statement (1971: 30). The language names are introduced in such a way that the rule becomes formally incorrect as a rule of a Chomsky-type generative grammar. (The proposed rule seems to be just a semi-formal rendering of an informal English statement on English and Chinese.)

e. any non-linguistic entity brought in from other disciplines (psychology, sociology etc.);

d. specific language learners and their actual learning behaviour.

What kind of language is to be used?

There are, of course, other problems that beset CA, both of a theoretical and a practical kind, but these four are the ones that I shall single out in the present paper.

1.3. On solving the problems in a new framework.

I shall propose a unified solution to the four problems within a recent conceptual framework, *integrational linguistics*, which is intended as a framework for linguistics in general, not only for contrastive studies. In integrational linguistics, theories of language and theories of grammars are clearly distinguished; certain grammars are conceived as 'applied' theories that can refer to specific speakers and speech-events; heavy emphasis is placed on 'integrating' individual grammars with a theory of language; and special attention is paid to the question of interrelating linguistic and non-linguistic theories. These features of integrational linguistics should make it particularly suited as a framework for contrastive studies although it has been developed for linguistic studies of any type.

I shall characterize integrational linguistics only to the extent that is indispensable for the purposes of this paper. This means restriction to just one of its aspects, the conception developed for integrating different theories, which motivates the very name of integrational linguistics. Even so, much desirable detail will have to be omitted, and it will be unavoidable that fairly technical notions are characterized in a highly informal way. I shall indeed choose a deliberately informal style to bring out the essential points instead of burying them in technical detail.²⁰ My presentation should be sufficient, though, to show the relevance of integrational linguistics to CA by indicating a model in which the theoretical problems (1) to (5) receive a unified solution.²¹

²⁰ For a more precise picture of various points of integrational linguistics, the reader will be referred to more technical papers.

²¹ For an introduction to integrational linguistics, cf. Lieb (1977b) which also contains a bibliography of the relevant work done by Lieb and other authors. The framework includes a theory of grammars (Lieb 1974 and 1976b) and a theory of language, still incomplete (Lieb 1970; Lieb in prep. vols 4 and 5 will systematically present the morphosyntactic and semantic conceptions outlined in various sections of 1976b (cf. also forthcoming (a) and partly characterized in (1977a)). On theory integration and the status of linguistics in general, see Lieb (1976c), and, in particular, Part II of (1977b).

I am not, of course, claiming that previous models are completely inadequate for dealing with any of the problems (1) to (5). Still, the following points may be evident to anybody familiar with the literature on CA, given our previous discussion: (a) The *problem of the linguistic and the non-linguistic*, to the extent that it has been recognized in traditional CA, remains unsolved.²² In particular, if we adopt a generative transformational framework, we run into the notorious difficulties of relating a grammar as a 'theory of competence' to whatever we may decide to understand by a 'theory of performance'. (See above, fn. 5.) (b) The *problem of concreteness* remains unsolved. In particular, if we adopt a generative transformational framework of the classical type, we find ourselves stuck with the notorious 'ideal speaker-listener in a completely homogeneous speech-community', who is about the last person we might wish for in a context of second-language learning. (c) The *problem of the general and the particular* may have received more attention in CA than the two previous ones but we are certainly far from having arrived at a generally accepted solution. (d) The *problem of the metalanguage* in its restricted form, apparently solved in a generative transformational framework, turns out to persist on closer analysis (see above, discussion of (4)). In its expanded form it has hardly been recognized.

In what may well be the best theoretical treatise on traditional CA, Di Pietro (1971 : 12) reminds us that 'an axiom well worth remembering is that a CA is only as good as the linguistic theory on which it is founded'. In the present paper, I shall be more concerned with demonstrating the adequacy of integrational linguistics for CA than with pointing out the shortcomings of other 'models'. While not a panacea for all previous ills, adoption of integrational linguistics may lead to a sounder type of CA that satisfies the general requirements put forward by Slama-Cazacu.

In the following Section 2, I shall characterize in an informal way my conception for integrating both linguistic theories and linguistic and nonlinguistic ones. Section 3 will then outline an 'integrational' format for contrastive analysis in which the five theoretical problems of Section 1 may be solved.

²² The general situation is neatly summarized by Kühlwein (1976 : 207) in his review of Alatis (ed.) (1970): "It is perhaps the greatest advantage of this volume to have shown without ambiguity the necessity of such an interdisciplinary way of looking at language phenomena. With equal clarity it shows, however, that we have up to now not yet been able to develop adequate conceptual and methodological tools which can cope with this integral view. We have not yet got a theory which is able to describe grammatical, anthropological, psychological and sociological components of language use in a unified way — and it is doubtful whether such a theory ... will ever be developed. Most contributions to this volume ... cannot show ... the ways in which the results of the respective investigations can be related to each other: within the framework of a formally consistent system".

2. Theory integration in integrational linguistics.

2.1. Grammars and theories of language: integration by presupposition.

We shall understand the term 'theory of language' in such a way that a theory of language is a theory that contains universal implications on languages but does not allow for any reference to grammars (understood as theories proposed by the linguist).

Obviously, this is not a definition, quite apart from the fact that the term 'theory' has been left unexplained. Still, our rough characterization seems to exclude theories of language as understood in generative grammar. A theory of language in our sense might contain a sentence of the form:

(6) Every language has sentences.

In a theory of language as envisaged in generative grammar, we would rather have sentences like, "Every language allows for a grammar such that there are non-blocked derivations beginning with the symbol 'S'".²³

Consider a reformulation of (6) that brings out more clearly its logical properties. Let '*D*' stand for any natural language or any system of signs that is derivative on natural languages. Let '*f*' stand for any syntactic unit of a natural language. Obviously, the following is an equivalent reformulation of (6):

(7) For all *D*, if *D* is a language, then there is an *f* such that *f* is a sentence of *D*.²⁴

Again, (7) is a sentence that could appear in a theory of language; in a much clearer sense than (6), it is a universal implication on languages. Henceforth, I shall take (7) as my example.

Let us now consider grammars of particular languages. We shall understand the term 'grammar' in such a way that a grammar of a language may be taken as a theory that contains sentences of the language but does not allow for reference to symbols used by the linguist in describing the language. Again, this is only a rough characterization, which, however, excludes generative grammars as formally construed in the theory of generative grammars: such grammars are algorithms for generating formal objects such as 'structural descriptions' which it is then necessary to interpret with respect to the natural language under discussion.²⁵

²³ For further discussion of this point, cf. Lieb (1975: Sec. 1.4).

²⁴ Strictly speaking, (7) and (6) are not completely equivalent since (6) but not (7) implies (or presupposes) existence of *several* sentences.

²⁵ For details, cf. Lieb (1974: Sec. 1). By deviating from the official conception of generative grammars, it may be possible to reconstruct a generative grammar in such a way that it is no longer excluded by our criterion (i.e. Sections 1.5f).

Take a specific language, say, English. We assume that any grammar of English contains a sentence of the form

(8) English is a language.

This seemingly trivial sentence is the decisive link for connecting a grammar of English and a theory of language. It is one of the shortcomings of generative grammars that they cannot formally accommodate sentences like (8). Such sentences should be included among the *key sentences* of a grammar because of their rôle in deductive processes that involve both the grammar and a theory of language. From (8) and (7), we directly obtain as a logical consequence:

(9) There is an f such that f is a sentence of English.

Clearly, we would like to have a sentence like (9) in any grammar of English.

Moreover, (9) should not be introduced as an independent assumption: it formulates a consequence of the fact that English is a language, and should be treated as such, i.e. (9) should be treated as a theorem derivable from (8) and (7) *in the grammar*. This requires that (7), a theorem of a theory of language, should be available for deductive purposes in the grammar itself. At the same time (7) must not be included among the theorems of the grammar because it does not specifically deal with English.

Our example is easily generalized. We thus arrive at a conception of a grammar as somehow including a theory of language.

In integrational linguistics, this idea is made precise. Both a theory of language and a grammar of a language are conceived as axiomatic theories. More precisely, they are 'abstract' axiomatic theories that may be applied to data via 'idiolect grammars' (cf. below, Sec. 2.5).²⁶ Taking grammars and theories of language as axiomatic theories, the desired relationship between a grammar and a theory of language can be formally defined as a relation of 'presupposition': a grammar *presupposes* a theory of language, in a technical sense. This means, very roughly, that some or all 'valid sentences' of the theory of language are included among the 'valid sentences' of the grammar but not among its axioms, definitions, or theorems. A 'valid sentence' of a theory is taken as, roughly, a sentence that may be used freely in proofs; this includes, in particular, the axioms, definitions, and theorems of the theory. On this conception, a grammar of English that contains (8) as an axiom would presuppose a theory of language containing (7); this sentence would appear among the valid sentences of the grammar; hence, (9) would be obtained as a theorem of the latter.²⁷

²⁶ In precisely which sense the term 'axiomatic theory' applies to grammars of languages and theories of language is spelled out in Lieb (1974: Secs. 2 and 3).

²⁷ For a formal account, including a definition of 'presupposes', cf. Lieb (1974: Sec. 3.4).

Actually, a grammar and a theory of language should be related even more closely than by the relation of presupposition. For a demonstration, we resume discussion of our previous example.

2.2. Grammars and theories of language: integration by formulation-in-terms-of.

Consider the logical status of the term 'sentence' as used in (7). In (6) it might look as though 'sentence' denoted a simple set: the set of 'sentences'. (7) makes it clear that 'sentence' must be taken as a relational term: f is a sentence of D . Technically, the term 'sentence (of)' as it occurs in (7) denotes not a set of syntactic units of any language but a two-place relation between entities f and D , or set of ordered couples $\langle f, D \rangle$: the term denotes the set of couples $\langle f, D \rangle$ such that f 'is a sentence of' D , i.e. such that f and D satisfy certain conditions that would have to be spelled out in the theory of language.

If (9) is to be obtained by logical deduction from (7) and (8), the term 'sentence' must be understood in exactly the same sense in both (7) and (9): both in the theory of language and in the grammar of English, 'sentence (of)' denotes the relation between arbitrary f and D such that f 'is a sentence of' D . (9) also contains the term 'English'. This is a constant that does not occur in the theory of language at all but is only introduced in the grammar.

This example suggests the following idea. In a grammar of a language, the only undefined term specific to the grammar is a constant like 'English' that names the language (and, possibly, a constant for a system of the language if languages are not identified with systems). In speaking about the language (or its system) we use the grammar specific constants ('English') *in conjunction with* terms from the theory of language ('sentence'), formulating sentences like (9). We may, of course, define additional constants on the basis of these terms, but other than that there is no special terminology for the grammar.

It may be objected that we cannot do without grammar specific expressions that refer to the categories, syntactic structures etc. of the given language. Thus, we may wish to state that the set of English sentences is denumerable. We must then have an expression to refer to the *set* of English sentences, which is a specific syntactic category of English.

True enough, but this still does not force us to introduce a grammar specific constant to name that set. Given expressions like 'sentence (of)' and 'English', we make use of the following logical device. Let ' R ' stand for any two-place relation between entities f and D . Then:

(10) *Definition.* R -of- D = the set of all f such that R holds between f and D (such that $\langle f, D \rangle \in R$).²⁸

²⁸ For the logical status of 'R-of-D', cf. Carnap (1958: Sec. 33d).

As an example, we have:

(11) sentence-of-English = the set of all f such that sentence-of holds between f and English.²⁹

Actually, (9) is logically ambiguous between the following two interpretations:

- (12) a. There is an f such that $\langle f, \text{English} \rangle \in \text{sentence-of}$.
 b. There is an f such that $f \in \text{sentence-of-English}$.

This example can obviously be generalized to a great number of cases: the set of phonemes of English, the set of nouns of English etc. are all categories that can be denoted in this way: by complex expressions of the form phoneme-in-English, noun-in-English etc. which are composed of a constant from the theory of language and a name of the given language.

We thus arrive at a conception on which a grammar of a language is formulated in terms of a theory of language in roughly the following sense. In speaking about the language, we use one or two grammar specific constants (names of the language and its system) in conjunction with terms from the theory of language, forming, if necessary, compound descriptive expressions as just explained or introducing additional constants by definition.

In integrational linguistics, this idea is made precise and, with a few modifications, adopted. A grammar of a language thus is to be formulated in terms of a theory of language in a precisely defined sense.³⁰ In this sense, it is implied that the grammar presupposes the entire theory of language. The grammar and the theory of language are thus integrated in a very close way.

So far, we have been speaking of grammars of entire languages. We shall now indicate how the internal variability of languages can be taken into account even in such grammars. Our proposals will imply that terms like 'sentence' should not be used in relation to entire languages but be relativized to 'idiolect systems'. This also means that expressions like 'sentence-of-English' are not needed; instead, we may have to introduce corresponding expressions in which 'English' is replaced by a constant or variable for 'idiolect systems'.

2.3. Accounting for language variability.

Let us adopt the following assumptions on languages. A natural language D is a set of individual 'means of communication'. Each means of communication is a set of abstract texts, and is homogeneous relative to the varieties of D (its dialects, sociolects, etc.), that is, only in its entirety can the means of communication belong to a variety of D . The varieties are subsets of D .

²⁹ More briefly, sentence-of-English = the set of all sentences of English.

³⁰ Cf. Lieb (1974: Sec. 3.4), for a formal definition.

The elements of D will also be referred to as *idiolects* in D but this term is not to carry all its usual connotations. (In particular, an individual means of communication is *not* identical with the speaker's entire share of the language; this share is a *set* of means of communication).

Each means of communication C has a system S by which it is determined. There are also systems for the entire language D and for the varieties of D .³¹ Such a system is an abstraction from the systems of individual means of communication. More specifically, given a set of means of communication, any system *for* the set is a construct of properties shared by the systems of all means of communication in the set.³²

Traditionally, a grammar of a language is to be a 'theory', 'description' etc. of a (or the) system of the language. In keeping with this view I shall understand a grammar of a language or language variety D as a theory of D and a system for D . (Note that language varieties have been included).

Any system for D is to be based on common properties of systems of means of communication that belong to D . Thus, any grammar of D is ultimately concerned with such common properties.

This suggests the following form for the essential theorems of any grammar of D :

(13) For all C and S , if C is an element of D and S a system of C , then... The variable ' D ' might be replaced by 'English' but also by 'Standard British English' or any name of a dialect, sociolect etc. of English.

The part of (13) that follows after 'then' may be of any logical form whatever but must involve the system S . For instance, in a grammar of English we might have the following theorem:

(14) For all C and S , if C is an element of English and S a system of C , then there is an f such that f is a sentence of S .

This is a statement to the effect that in any system of any English idiolect, there are sentences.

We previously assumed that the term 'sentence', as a term of a general theory of language, denoted a relation between arbitrary syntactic units f and languages D . 'Sentence' has now been reintroduced in a new sense: as a

³¹ I shall make a terminological distinction between systems of means of communication and systems for sets of means of communication.

³² This very roughly indicates some of the general ideas that underlie the detailed formal theory in Lieb (1970), including the modification suggested in Lieb (1976b: Sec. 6.3; 1977b: Secs 1.3f; *forthc.* b.) See these references for the explication of the concepts just introduced. For a fuller view of idiolect systems, cf. Lieb (1977b, in prep. vol. I) and the work on which it is based (indicated above, fn. 21). It is remarkable that Nemes and Slama-Cazacu, in their proposal for 'contact analysis', should heavily emphasize the rôle of 'individual linguistic systems' in a sense which brings them close to our 'idiolect systems' (1970: esp. 116ff; cf. also Slama-Cazacu 1973). It is thus possible to reconstruct basic features of 'contact analysis' within our framework (cf. fn. 46, below).

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name of a relation between syntactic units f and *idiolect systems*. We shall indeed abandon it in its former use, for the following reason. Terms like 'sentence' traditionally involve languages understood as systems. On our conception, no language is itself a system, and a system of a language is a construct of properties of idiolect systems. Thus, it is in connection with idiolect systems that the traditional terms are really needed.

In other words, we modify the presupposed theory of language. The modification requires that (7) be replaced as follows:

(15) For all D , if D is a language, then: for all C and S , if C is an element of D and S a system of C , there is an f such that f is a sentence of S . That is, in all systems of idiolects in a language, there are sentences. (14), a theorem of a grammar of English, is obtained from (8) and (15), a theorem of a theory of language.³³

By going back to systems of individual means of communication, we have a principled way of taking language variability into account. At the same time, a grammar of a language can be related to a theory of language in exactly the same way as before: the grammar is formulated in terms of the theory of language, which implies that the latter is completely presupposed by the former.

A grammar of a language variety is also to be formulated in terms of a theory of language. In addition, it may be formulated, or partly formulated, in terms of a grammar of a language to which the variety belongs. Ideally, any grammar of a variety of a language will at least *presuppose* a grammar of that language.

By formulating a grammar in terms of a theory of language, we make the latter available for deductions in the former. In this context it may be necessary to prevent a misunderstanding. Many theorems of a grammar are indeed obtained from the theory of language and the axiom or theorem stating that we are confronted with a language or language variety. But this is not generally true. There are axioms specific to the grammar, and many theorems that depend on them. For instance, let D be a certain variety of *English* and assume that the concept of phoneme makes sense in the presup-

³³ (15) may be understood as stating that the category of sentences exists in any language in the sense that the set of sentences is non-empty in any system of any idiolect of any language (cf. also (12b)). Contrary to a widely accepted presupposition, existence of a term in a theory of language does not imply existence of a corresponding category in all languages: We may have a term like '(is a) verb (of)' in the theory of language even if it is not true for all languages that there are verbs in the systems of their idiolects. After all, we may wish to formulate 'implicational universals' of the form: For all languages D , if for all systems S of idiolects in D verb-of- S is non-empty, then... Such universality statements are needed even if verb-of- S is empty for all idiolect systems S of some languages.

posed theory of language.³⁴ Assume a grammar of D . As an axiom or theorem specific to the grammar, we might have a sentence of the following form: (16) For all C and S , if C is an element of D and S a system of C , then Phoneme-of- $S = \{/p/, /b/, \dots\}$.³⁵

Note that (16) is an axiom or theorem *not a definition*: It is ruled out as a definition already by the fact that 'Phoneme-of- S ' is a logically complex term, not a simple constant as would be required for the definiendum of a definition that is an identity. The term 'phoneme (of)' could be defined, if at all, only in the theory of language. (16) is an axiom or theorem of a grammar of D that *identifies* — correctly or incorrectly — the phonemes of any appropriate idiolect system S .

For integrating grammars and theories of language, or a grammar of a variety and of a language, we used formulation-in-terms-of and presupposition. How are we to relate grammars of different languages or language varieties?

2.4. Grammars and grammars: integration by conflation.

Suppose that we have two grammars, each of a variety of a different language, and we wish to formulate contrastive statements on the two varieties. Obviously, this is the archetypal case for contrastive analysis. Let us first try to gain some clarity about the form of such statements.³⁶ Consider the following example.

Let D_1 and D_2 be two varieties. Both grammars may be assumed as formulated in terms of the same theory of language. Thus, in the grammar of D_1 we might have a theorem such as:

(17) For all C and S , if C is an element of D_1 and S a system of C , then $/p/$ is a phoneme of S .

And in the second, either (18a) or (18b):

(18) a. For all C and S , if C is an element of D_2 and S a system of C , then $/p/$ is a phoneme of S .

b. For all C and S , if C is an element of D_2 and S a system of C , then $/p/$ is not a phoneme of S .³⁷

³⁴ ' D ' is a constant (more precisely, an ambiguous constant), as opposed to the variable ' D '. Similarly, for other letters.

³⁵ Phoneme-of- S = the set of phonemes of S , cf. (10) and (11). '/p/' etc. are assumed as constants of the grammar that are defined by phonetic constants of the theory of language (cf. Lieb 1976b: Sec. 1.2, for a more systematic account).

³⁶ In the literature on CA, very little thought has been given to the question of what should be admitted as a contrastive statement.

³⁷ '/p/' is defined separately in the two grammars but by identical definitions depending only on phonetic constants of the same theory of language. Thus, there is no

The conjunctions of (17) and (18a), and (17) and (18b), could be taken as *contrastive statements* on D_1 and D_2 , where (17) and (18a) yield a *positive* and (17) and (18b) a *negative contrastive statement*:

(19) a. (17) and (18a).

b. (17) and (18b).

Contrastive statements may also be *mixed*; an example of this would be the conjunction of the sentences obtained from (17) and (18b) by adding, 'and /b/ is a phoneme of S '.

True enough, these are very simple examples but they clearly allow for generalizations. I shall not, however, attempt to formulate the generalizations, and I must leave it undecided whether they would cover all relevant cases.

The important fact about (19a) and (19b) is this: they are neither theorems of the grammar of D_1 (in which no reference is made to D_2) nor of the grammar of D_2 (in which no reference is made to D_1). Where do they belong?

We are here confronted with a major problem of traditional CA: the nature and place of contrastive statements, as opposed to the nature and place of statements restricted to single languages. This problem was briefly discussed in connection with (4), the problem of the metalanguage in its restricted form (above, Sec. 1.2). Integrational linguistics provides a third form of theory integration, by which contrastive statements can be assigned a place in a theory: integration by *theory conflation*.

The conflation of two 'compatible' theories is, roughly, a new theory whose axioms are the axioms of the two original theories (except for axioms in one theory that are definitions in the other).³⁸ This is different from presupposition, where the axioms of the presupposed theory lose their status as axioms.

The grammars of D_1 and D_2 may be assumed as 'compatible' theories (partly due to the fact that they have been formulated in terms of the same theory of language). Hence, their conflation again is a theory. This theory is obviously formulated in terms of the theory of language in terms of which the two grammars are formulated, and presupposes any theory that they do. Given (17) and (18a) or (18b) as theorems of the grammars of D_1 and D_2 , respectively, their conjunction (19a) or (19b) is a theorem of the conflation of the two grammars.

The conflation, or some part of it that is essentially restricted to contrastive statements, is a natural candidate for a 'contrastive grammar'. How-

equivocation in using '/p/' in both (17) and (18). (I am, of course, fully aware that many structural phonologists would have rejected a phonological theory that allows for 'the same phoneme' in different languages, but this is not the place to enter into a discussion.)

³⁸ For a formal account, cf. Lieb (1974: Sec. 3.4), where also the notion of 'compatibility' is defined.

ever, it may well be that the use of the term 'grammar' should not be extended to cover the conflation of grammars of varieties or languages, or any 'contrastive part' of such a theory.³⁹ For construing contrastive statements as theorems it is quite sufficient that the conflation of such grammars again is a theory.

Grammars of languages, or even varieties, do not take us down to individual speakers: the grammars are 'abstract' axiomatic theories. They are related to individual speakers and speech-events by becoming integral parts of grammars of specific means of communication.

2.5. Idiolect grammars. Non-linguistic theories.

An idiolect grammar is conceived as an axiomatic theory of an individual means of communication and a system of the means. However, the grammar is not an abstract but an 'applied' axiomatic theory. It has a part that is an abstract theory of the means and its system, and another part that includes reference to concrete speakers and speech-events: to persons who use the means of communication, and to corresponding speech-events. Strictly speaking, an idiolect grammar as an applied axiomatic theory is a theory of an idiolect, a system of the idiolect, one or more speakers of the idiolect, and specific utterances made by the speakers in using the idiolect. Obviously, there may be a great number of idiolect grammars that contain identical abstract theories of the same idiolect and system but differ in their application to speakers and utterances.⁴⁰

An idiolect grammar again is to be formulated in terms of a theory of language. The grammar specific constants are names for the idiolect, the system, the speakers, and the utterances. Ideally, the idiolect grammar presupposes not only the theory of language but also grammars of the language and of the varieties to which the idiolect belongs. Thus, whatever is true of the idiolect and its system for general, language specific, or variety specific reasons, can be stated in the idiolect grammar. For example, assume an idiolect C and system S such that

(20) C is an element of D , and S a system of C .

Given an idiolect grammar that presupposes a grammar of the variety D of English, (20) and (16) together yield the following theorem of the idiolect grammar:

(21) Phoneme-of- $S = \{/p/, /b/, \dots\}$.

³⁹ It was suggested already in Hamp (1968: 144) that 'the term 'contrastive grammar' is probably a misnomer'.

⁴⁰ The concept of an applied axiomatic theory is formally defined in Lieb (1974: Sec. 3.1). Lieb (1976b) is a detailed investigation into idiolect grammars as applied axiomatic theories.

Again, there are axioms and theorems that are specific to the idiolect grammar in its system-related part.

The 'application part' of the idiolect grammar contains axioms that relate the idiolect or its system to speakers and utterances. In our assumed idiolect grammar we might have an axiom of the form:

(22) V is a normal utterance by V_1 of f in S ,

where ' V ' is the name of a certain sound-event, ' V_1 ' the name of a certain person, ' f ' denotes a syntactic unit of S , and ' S ' is understood as above.

In (22), the term 'normal utterance' is taken from the theory of language in terms of which the grammar is formulated. It may, however, be a constant that was taken over into the theory of language from a general theory of communication that the theory of language presupposes.

Generally, a linguistic theory, such as a theory of language or a grammar of a language, language variety, or idiolect, may presuppose non-linguistic ones. The relation of presupposition is transitive; hence, any non-linguistic theory presupposed by the theory of language is also presupposed by any grammar formulated in terms of that theory. Moreover, a grammar may presuppose non-linguistic theories that are not presupposed by the theory of language.

Theory integration by presupposition is, however, not generally sufficient for relating linguistic and non-linguistic theories. Consider the cases of (i) a theory of language change and (ii) a theory of language learning. In (i), a theory of language and a theory of physical time should be available for deductions, and in (ii), a theory of language and a theory of learning. There is an important difference, though, between the theory of language learning and the theory of language change. The former is a 'linguistic intertheory', a theory that belongs to a shared branch of linguistics and some non-linguistic discipline (e.g. psychology). The latter is not an intertheory — there is no shared branch of linguistics and physics to which a theory of language change could reasonably be assigned. There are general considerations (cf. Lieb 1977b, Part II, Sec. 2) to support the view that an intertheory does not presuppose its 'parent' theories but is an *extension* of each of them (contains them as parts); all axioms and definitions of the 'parent' theories are axioms and definitions of the intertheory, which may contain additional axioms and definitions. Thus, in (ii) the theory of language and the theory of learning are *coextended* by the theory of language learning, which is an extension of both (contains them as parts). In (i), the theory of language change, which is not a linguistic intertheory with respect to physics, should be taken as a *part* of the theory of language, which in turn *presupposes* the theory of physical time. Thus, axioms, theorems, and definitions of the latter are available in the theory of language change without becoming axioms, theorems, or definitions of the theory of language.

Conflation (of compatible theories) can now be recognized as a limiting case of coextension: the conflation of two compatible theories is a joint extension that does not add any new axioms or definitions.

This concludes our outline of relevant conceptions in integrational linguistics.

2.6. Summary.

For integrating different theories, both linguistic and non-linguistic ones, we considered four different possibilities: presupposition, formulation-in-terms-of, conflation, and extension or coextension. Formulation-in-terms-of implies presupposition, and conflation is a limiting case of coextension (assuming compatible theories).

Grammars of a language, language variety or idiolect were all assumed as formulated in terms of the same theory of language in roughly the following sense. In speaking about the language, variety, or idiolect, we use terms of the theory of language in conjunction with a name for the language, variety, or idiolect (and one of its systems). Assumptions were made that justify consideration of idiolect systems even in the case of languages and their varieties: it is properties of relevant idiolect systems that constitute a system for a language or variety. Thus, for formulating a grammar of a language or variety in terms of a theory of language, the latter must provide terms with which we can refer to the categories, units etc. of arbitrary idiolect systems.

Formulation-in-terms-of is defined in such a way that a theory formulated in terms of another entirely presupposes the latter, in roughly the following sense: All 'valid sentences' of the second theory are 'valid sentences' of the first but do not belong to its axioms, theorems, or definitions. In this way a theory of language is entirely presupposed by any grammar formulated in terms of it.

Ideally, a grammar of a variety of a language presupposes a grammar of that language, and a grammar of an idiolect in that variety presupposes a grammar of the variety. As the relation of presupposition is transitive, an idiolect grammar presupposes any theory presupposed by the variety grammar.

Grammars of different languages or varieties may be conflated. Contrastive statements may be obtained as theorems of such conflations.

Linguistic and non-linguistic theories may be related by presupposition; in particular, the linguistic theory (a theory of language, say) may presuppose the non-linguistic one (such as a theory of physical time). As a second possibility, we have coextension: both the linguistic theory (a theory of language) and the non-linguistic one (a theory of learning) are coextended by a theory (a theory of language learning) that is an extension of either theory. Coex-

tension relates a linguistic and a non-linguistic theory that are extended by the same 'linguistic intertheory'.

Grammars of languages and their varieties and theories of language are taken as 'abstract' axiomatic theories that may be related to linguistic data via idiolect grammars conceived as 'applied' axiomatic theories. It should be obvious that grammars as they have now been characterized have no counterpart among generative grammars of any kind: a grammar of a language or language variety, let alone of an idiolect, may presuppose a theory of language or non-linguistic theory in a sense where this theory is actually incorporated into the grammar. Generative grammars, to the extent that they conform to a formally explicit theory of grammars, can possibly be understood as notational variants of integrational grammars of a very limited type.⁴¹ However, for fully developed integrational grammars (that presuppose non-linguistic theories) appropriate generative grammars simply do not exist.

Let me emphasize that my outline of theory integration in integrational linguistics has been highly informal; for many questions, the reader will have to turn to the sources on which the outline is based. Even so, it should now be possible to characterize a format for CA in which the theoretical problems (1) to (5) can be solved.

3. An integrational format for contrastive analysis.

3.1. Simplified example of a second-language learning situation.

Consider a very simple and somewhat idealized case of second-language learning. The learner is a monolingual who has command of only a single means of communication C in his language D_1 . C may be assumed to belong to several varieties of D_1 simultaneously: to a certain dialect, sociolect, style of speech etc. The learner is to learn a second language D_2 in a teacher-controlled situation. This may be understood in roughly the following sense. The teacher has singled out a certain set of varieties of D_2 (at least one such set), and the task of the learner is, ideally, to develop a means of communication that is a 'possible element' of each of the varieties. If, for instance, D_2 is English and the varieties are Standard British, Formal, Oral, Upper Middle Class, the means of communication is to be a possible element of Standard British Formal Oral Upper Middle Class English, i.e. of the set of idiolects that is the intersection of these varieties. This means of communication is to be a *possible element* of the intersection in roughly the following sense: it is determined by a system such that, if we consider a system of an idiolect in the

⁴¹ Cf. Lieb (1974: Secs. 1.5f).

intersection, the two systems share all 'relevant' properties, i.e. all properties on which systems for varieties of English may be based.

What is the place and form of contrastive linguistic studies in this situation?

3.2. Contrastive analysis based on grammar conflation.

Ideally, we would require at least two theories: one to account for the position of the learner's idiolect C in his language, the other to account for the place that the new means of communication is to occupy relative to the target language. The first theory would be a theory of the intersection D_1^* of the varieties of D_1 to which C belongs, the second a theory of the intersection D_2^* of the varieties of D_2 that were singled out by the teacher. Admitting the intersections as *derived varieties*, we may take the two theories as *variety grammars*.

Both grammars are to be formulated in terms of the same theory of language and may be assumed as 'compatible'. Hence, the conflation of the two grammars is again a theory, and is formulated in terms of the theory of language. In the conflation, contrastive statements on the two varieties can be derived, which may be positive, negative, or mixed.⁴²

The conflation of the two grammars presupposes the entire theory of language. Ideally, the grammar of D_1^* would further presuppose a grammar of the language D_1 , and the grammar of D_2^* a grammar of D_2 , both formulated in terms of the given theory of language. The grammar of D_1 would presuppose theories of language types to which D_1 belongs, similarly, for D_2 .⁴³ All these grammars and theories would be presupposed by the conflation of the grammars of D_1^* and D_2^* . This conception allows us to distinguish

⁴² In my view, all such statements should be considered in contrastive studies: Harris's early suggestion "that it may prove possible to acquire a language by learning only the differences between the new language and the old (leaving those features which are identical in both to be carried over untaught)" (1954 : 259) was immediately qualified by reference to 'educational and psychological considerations' (i.e.). Still, it has been repeatedly advocated to exclude the positive ones, e.g., Di Pietro (1971 : 30); Bausch (1973 : 176) (who would admit them only in 'linguistic contrastive grammar'), or Zaborcki (1970) (who even proposes a distinction between 'contrastive' and 'confrontational' linguistics based on exclusion vs. inclusion of positive contrastive statements). Recently, attention has been drawn by Ebnetter (1974 : 95f) to the importance of mixed contrastive statements; cf. already Nemser and Slama-Cazacu (1970 : 104): "The term 'contrastive' is a partial misnomer since similarities between T and B are usually a prerequisite for interference". (Needless to say, previous authors did not refer to contrastive statements in precisely our sense; it usually remains unclear how exactly they conceive of the form of such statements).

⁴³ Language types will be taken as *sets* X of languages D . For the logical problems connected with the concept of type in linguistic typology, cf. Greenberg (1974).

the following cases with respect to the contrastive statements derived in the conflation.

- (23) *General case*. The contrastive statement follows from:⁴⁴
- two axioms or theorems of the grammars of D_1^* and D_2^* of the form: D_1^* (D_2^*) is a variety of D_1 (D_2);
 - two axioms or theorems of the presupposed grammars of D_1 and D_2 of the form: D_1 (D_2) is a language;
 - axioms, definitions, or theorems of the theory of language.
- (24) *Typological case*. The contrastive statement follows from:
- [=(23a)];
 - one or more axioms or theorems of the presupposed grammar of D_1 of the form: D_1 belongs to [language type] X_{1i} , for $i=1, \dots, n$; and one or more axioms or theorems of the presupposed grammar of D_2 of the form: D_2 belongs to [language type] X_{2j} , for $j=1, \dots, m$
 - axioms, definitions, or theorems of one or more presupposed theories of language types X_{1i} , for $i=1, \dots, n$, that do not include or depend on: X_{1i} is a language type; and axioms, definitions, or theorems of one or more presupposed theories of language types X_{2j} , for $j=1, \dots, m$, that do not include or depend on: X_{2j} is a language type.
- (25) *Language specific case*. The contrastive statement follows from:
- [=(23a)];
 - axioms, definitions, or theorems of presupposed grammars of D_1 and D_2 that do not include or depend on (23b) or (24b).
- (26) *Variety specific case*. The contrastive statement follows from axioms, definitions, or theorems of the grammars of D_1^* and D_2^* that do not include or depend on (23a).

In the general case, a contrastive statement can only be positive, for obvious reasons; in all other cases, it can be either positive, negative, or mixed.

In relating a contrastive statement to statements on language learning we may have to consider not only its type (positive, negative, or mixed) but also its relation to the four cases (23) to (26).

Statements on the learning of languages are provided by a theory of language learning that is presupposed by both grammars, hence, by their conflation. This theory is an extension of the theory of language in terms of which the grammars are formulated, and of an appropriate theory of learning.

Ideally, the theory of language learning will contain theorems on the effects of language contrasts on second-language learning (for instance, classical 'interference' assumptions would be reconstructed as such theorems). Theorems

of this kind would have to be conditional, i.e. the effects would have to be assumed for learning situations of certain types. Also, many theorems should be probabilistic. Even so, the theorems would have the form of universal statements. It is one of the main problems with traditional CA that its assumptions on the effects of language contrasts were not properly conditionalized; and much later criticism can be understood as due to this fact.⁴⁵ Of course, proper conditionalizing requires empirical research; all I have been able to do here is to formulate the problem.

Whatever the precise theorems on language learning, they are all available in the conflation of the grammars of D_1^* and D_2^* since either grammar presupposes the entire theory of language learning. Moreover, if the grammar of D_2^* also presupposes a grammar of D_2 and theories of relevant language types, we may have special theorems on the learning of languages of a D_2 -type, or just of D_2 . All axioms and theorems on language learning can now be used in the conflation for deriving theorems on the effects that contrasts between the two varieties — in the last analysis, between systems of their idiolects — have in a learning situation as characterized in Sec. 3.1.

We still have to relate the conflation of the grammars of D_1^* and D_2^* to the concrete language learner. Ideally, this would be done by formulating a grammar of the means of communication C , a system of C , the learner, and relevant utterances. The grammar is formulated in terms of the theory of language, and presupposes the conflation of the grammars of D_1^* and D_2^* (which should be equivalent to presupposing them separately). The grammar contains a theorem corresponding to (20):

(27) C is an element of D_1^* , and S is a system of C .

Thus, all theorems of the conflation that were formulated for arbitrary elements of D_1^* and their systems directly apply to C and S . This holds, in particular, for any theorem concerning the influence that contrasts between the systems of idiolects in D_1^* and D_2^* exert on any learner of D_2^* who has a D_1^* -linguistic background.

As pointed out above, such theorems should be assumed as requiring specific properties of the learning-situation. In particular, it may be a learner of a special type that is required. The speaker of C may be characterized as such a learner by special axioms in the application part of the grammar, in particular, by psychological assumptions such as axioms on the speaker's general memory capacity.

In addition, there may be special requirements on such learner-independent factors as the teacher. Corresponding assumptions can no longer be formulated in the grammar.

⁴⁴ That is to say: the statement can be derived in the conflation from the following set of sentences without introducing any other non-logical valid sentences of the conflation, and all sentences of the set are necessary for the derivation.

⁴⁵ James (1971) summarizes the arguments against traditional CA in nine points. Of these, at least the following ones seem to concern insufficient conditionalizing: 1, 2, 6 to 9.

They can be dealt with, however, via axioms or theorems of some other theory that is 'compatible' with the grammar of *C*. In this case, we may consider the conflation of such a theory with the grammar. Ultimately, the consequences of contrastive statements for a concrete learning-situation can be fully established only in the conflation of an idiolect grammar with other theories on concrete factors of the situation.⁴⁶

Assuming such a format for contrastive studies, can the theoretical problems of Sec. 1.2 be solved?

3.3. Solution to the theoretical problems.

On our conception of CA, the theoretical problems (1) to (5) have the following solutions.

The problem of the linguistic and the non-linguistic is solved by theory presupposition and coextension. Relevant non-linguistic theories are presupposed by a general theory of language, which then is presupposed in its entirety by grammars of diminishing degrees of generality. Or a non-linguistic theory (e.g. a psychological one) is related to a linguistic one (e.g. a theory of language) via an 'intertheory' (a psycholinguistic one) by which the two theories are coextended. The intertheory may again be presupposed by other linguistic theories. Theoretical frameworks for 'psycholinguistic' and similar 'mixed' consequences are provided by extensions of the theory of language in terms of which grammars are formulated.

The problem of concreteness is solved by theory presupposition and conflation and by the conception of an idiolect grammar as an applied axiomatic theory. Contrastive statements are obtained as theorems of the conflation of two or more grammars (of varieties rather than languages). The conflation

⁴⁶ Using idiolect grammars of the learner, and their conflations with other theories, agrees with a basic feature of 'contact analysis', insistence on "the fundamental role of ILS [individual linguistic systems, H.L.] and IVE [individual verbal events, H.L.] in the language-learning/-teaching process" (Nemser and Slama-Cazacu 1970:117). Our analysis supports the view that CA can only contribute to an analysis of a concrete learning-situation. Thus, it is quite compatible with the position that CA covers only certain of the factors that would have to be considered in 'error analysis'. At the same time, it does not construe any dubious alternative between 'error analysis' and CA. (I cannot here pursue any further the much discussed topic of the relations between CA and error analysis. For a recent discussion, cf. Barrera-Vidal and Kühlwein 1975: Sec. 6.5). Moreover, our conception easily accommodates the view that the learning of the target proceeds by a sequence of 'approximative systems'. The theory of language-learning may require a sequence of pairs $\langle C_i, S_i \rangle$ such that C_i , while not belonging to any language, is analogous to an idiolect in a language, and S_i is a system that determines C_i . The contrastive point of view would then be extended to include $\langle C_i, S_i \rangle$. (For a formal attempt within a generative framework, cf. Kohn 1974, 1976.)

is then presupposed by a grammar of an idiolect of the learner such that the idiolect belongs to one of the varieties in contrast and the target is one of the remaining varieties. Axioms of the idiolect grammar can be used to introduce special linguistic and non-linguistic assumptions on the learner. Thus, the idiolect grammar is a framework for deductions that combine contrastive statements with statements on the learner and can be used in explanatory or predictive arguments. However, certain assumptions on the learning-situation can only be taken into account in the conflation of the grammar with other theories on concrete factors of the situation.

The problem of the general and the particular is solved by theory presupposition and formulation of one theory in terms of another. A grammar of a variety of a language (analogously, of a language) is formulated in terms of a theory of language. Ideally, it presupposes a grammar of the language and theories of the types to which the language belongs; the grammar and the theories are formulated in terms of the same theory of language as the variety grammar itself. Given the conflation of two variety grammars (analogously, language grammars) as a framework for contrastive statements, certain contrastive statements can be singled out as due to the theory of language (23); others as due to typological theories (24); and others as due to the language grammars (25).

The problem of the meta-language: expanded form (which includes the problem in its restricted form) is solved by assuming an idiolect grammar that is formulated in terms of and presupposes theories as indicated before. The metalanguage is automatically provided as the 'total language' of the idiolect grammar, i.e. of a certain applied axiomatic theory. If the idiolect grammar has to be conflated with other theories, the metalanguage results from the 'amalgamation' of the total language of the idiolect grammar and the languages of the other theories.

These remarks must remain abstract as long as such terms as 'total language' and 'amalgamation' have not been explicated, and the conceptions of theories and theory integration been made more precise. Actually, the problem of the metalanguage has received a detailed solution for idiolect grammars and the presupposed linguistic theories.⁴⁷ This solution is too technical to be characterized within the limited space of this paper. I can only give a few informal hints.

The total language of an idiolect grammar — and the axiomatic language of any presupposed linguistic or non-linguistic theory — is based on a 'formalized system of logic' or a 'natural language reading' of such a system, i.e. on a regimented form of a natural language variety that is completely ex-

⁴⁷ In Lieb (1974: Secs. 2 and 3), and Lieb (1976b).

plicit as to its logical properties. All sample theorems in the present paper, beginning with (7), were given in a regimented form of a (written) variety of English.⁴⁸

Using such a format for the language in which a linguistic theory is formulated, we obtain a metalanguage (with respect to the subject matter of the linguistic theory) that is formally well specified and logically completely explicit. Moreover, it allows for separation of logical and non-logical (descriptive) components; among the latter, it is possible again to distinguish between components that belong to different theories. It is this possibility that can be exploited in developing a concept of theory integration.

Even if the four theoretical problems have been solved, there are many questions concerning CA that have not been touched upon. I shall briefly indicate a few, at the same time pointing out limitations of the present paper.

3.4. Further problems.

Some readers may have felt that I used the word 'ideally' rather too often. I have indeed been more concerned with characterizing a framework for CA than with the unavoidable limitations of actual research projects. Idealizations were used only to bring out more clearly essential aspects of the framework but may still entail problems that should be followed up.

It may also seem that the problems connected with axiomatic theories were not sufficiently recognized. After all, are we to wait for complete axiomatic theories of language, complete axiomatic grammars, or, even worse, complete axiomatic theories in psychology, sociology etc. until contrastive studies can be undertaken in the proposed framework? Questions of this kind are usually motivated by the belief that axiomatic theories are optional reformulations of well-developed theories that already exist in non-axiomatic form. This traditional belief is largely incorrect: axiomatic theories can be formulated at any stage of theory construction; they do not require existence of non-axiomatic theories; and they may have any degree of comprehensiveness relative to their subject matter. It has to be admitted, though, that these questions deserve much more consideration than they could be given here.⁴⁹

No systematic attempt has been made to relate the proposed framework

⁴⁸ We frequently introduced them by phrases like 'a sentence of the form' (cf. (8)), thus allowing for analogous sentences in other regimented forms of the same or other languages, or for corresponding formulae in a formalized system of logic.

⁴⁹ For further discussion, cf. Lieb (1974: Secs 3.3 and 4), and in particular (1976d).

to generative grammar or to other frameworks used in CA. In particular, a detailed comparison of integrational linguistics with generative grammar would have been unfeasible in the present context. The two following claims should be justified, though.

(a) Despite certain attempts in this direction, generative grammar has not developed anything to match our conception of theory integration: concepts like theory presupposition, conflation, and formulation of one theory in terms of another have simply not been defined.

(b) There is no analogue to integrational grammars in our sense that presuppose non-linguistic theories or linguistic intertheories, and to idiolect grammars understood as applied axiomatic theories.⁵⁰ Such grammars are contrary to one of the most persistent patterns of thinking in generative grammar, the ill-conceived distinction between 'competence' and 'performance' and the conception of grammars as 'theories of competence'.⁵¹

If generative grammar is used as a framework for CA, both (a) and (b) seem to preclude any systematic solution to the theoretical problems (1) to (5).

In concentrating on these problems, we left undiscussed all problems of practical method. Even important theoretical problems of CA were not considered, such as the status of CA as a discipline.⁵²

Another theoretical question that should be dealt with concerns the rôle of semantics in CA, which is usually discussed in connection with the problem of the 'tertium comparationis': what is it that two languages should be compared or contrasted for? Both problems can be discussed within the framework of integrational linguistics but only a few hints can be given here.

⁵⁰ See also above, end of Section 2.6.

⁵¹ I am not, of course, rejecting all distinctions along these lines. Even in our concept of an idiolect grammar, the distinction between a system and its use is accounted for by positing two different parts of the grammar: an 'abstract' theory of the idiolect and its system (dealing, for instance, with sentences not utterances), and an 'application part' that introduces reference to specific speakers and utterances.

⁵² There is considerable confusion and divergence of opinion concerning this question. Is CA a discipline at all or just a 'method' or an 'approach' (Ferguson 1968: 101)? Cf. already the critical remarks in Hamp (1968: 138f), based on a list of different names for CA, which also persist in later literature. Bausch (1973: 167) proposes a regularization of the terminology. If CA is a discipline, what is its systematic place, in particular with respect to 'applied linguistics' and 'theoretical linguistics'? Nickel (1975: 39) argues for 'Contrastive Linguistics' both as 'a theoretical discipline' and as 'Applied Contrastive Linguistics'. Slama-Cazacu (1974: 236) rejects the adjectives 'theoretical' and 'applied' in combination with 'contrastive linguistics', assigning contrastive linguistics as a whole to applied linguistics. (But again, the status of applied linguistics as a whole remains controversial in the literature). These questions can probably be tackled along the lines of Lieb (1976a) but this would require a separate study.

First, a negative point can be made. If two grammars are both formulated in terms of the same theory of language, we may have contrastive statements in their conflation that do *not* involve meanings and may still refer to any formal aspect of the relevant idiolect systems (not only to phonological ones, where this is usually seen as unproblematic): the terminology for such statements exists in the theory of language.⁵³ Such a position does not agree with recent opinions concerning the 'tertium comparationis'.⁵⁴ Of course, much more thorough discussion would be needed to justify our position.

Secondly, a positive point can be made concerning the place of semantics in CA. Integrational linguistics includes a theory of language by which sentence meanings are a function of morpho-syntactic surface structure.⁵⁵ On this conception, we have the following point of comparison for contrastive studies: how are the sentence meanings obtained from surface structures in different languages? While not the only important point of comparison, this is certainly a fundamental one. The form it takes in integrational linguistics is in partial agreement and partial disagreement with recent trends in CA.

On the one hand, there has been a tendency to abandon syntactic 'deep structures' in favor of 'syntactic-semantic' or purely 'semantic' structures.⁵⁶ This agrees with the suggested point of comparison in providing for meanings as implicitly related to syntactic surface structure.

However, this relation is conceived in the literature along the lines of generative semantics; syntactic surface structure does not play an independent rôle. The importance of surface structure is rarely emphasized in more recent theoretical writings on CA.⁵⁷ In taking sentence meanings as a function of morpho-syntactic surface structure, we assign an essential rôle to surface structures and do away with all sorts of 'deep structures', whether syntactic,

⁵³ Further terminology may be provided by other linguistic theories that are jointly presupposed by the two grammars.

⁵⁴ Cf. for instance, Corder (1973 : 255): "It looks, therefore, as if in the present state of linguistic knowledge, between the message and its physical expression in sound, there is a fundamental lack of common categories and relations available for really adequate comparison between the two languages. Meanwhile we shall have to rely on 'suggestive' parallels and partial, unrigorous comparisons". In this context, cf. also above, fr. 33, and discussion of (16): we may have a single concept in the theory of language ('phoneme') that covers a different reality in each language.

⁵⁵ For details cf. Lieb (1976b: Secs. 4 and 5.1); and Lieb (in prep).

⁵⁶ Cf. the authors listed in fr. 11 as supporting a 'generative semantics type grammar' or a 'semantically based' one. Typically, Krzeszowski proceeds from 'syntactic-semantic' deep structures in (1971) to purely semantic structures in (1972) and (1973).

⁵⁷ Explicitly, by Kufner (1973 : 27): "Wenn die Kontrastive Grammatik ihre Aufgabe als Vorbereitung für die Pädagogische Grammatik erfüllen soll, dann muß sie sich zunächst mit der Verschiedenheit der beiden Oberflächenstrukturen beschäftigen". Cf. also Dardjowidjoja (1974).

syntactic-semantic, or purely semantic.⁵⁸ I would indeed submit that concepts of deep structure are, at best, superfluous for CA⁵⁹ but this again is a point that cannot be followed up in the present paper.

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⁵⁸ In traditional generative terms, our approach to sentence meaning would be analogous to conceptions in 'interpretive semantics'. There has recently been a tendency in that school to base semantic interpretation exclusively on surface structures of the type provided by Chomsky's 'trace theory' (cf. Lightfoot 1976 for discussion and references). These structures would not yet be surface structures assumed in integrational linguistics (cf. Lieb (1977a) for discussion); and syntactic deep structures continue to figure in the new approach.

⁵⁹ Similarly, Kufner (1973 : 27).

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