1 *On psychological reality*

> Die Sprache führt kein autonomes Dasein und existiert nur im Sprechen
> und im Geist der Sprecher. (Coseriu 1974: 69)

1.1 Language as a social and psychological entity

This book will deal with psychological aspects of phonology. The choice
of this particular perspective is not meant to imply that there are no
other legitimate and interesting aspects of phonology, or grammar in
general, or that language can be exhaustively characterized in psy-
chological terms. To make these points clear, I will try, very briefly, to
define a reasonable position on these issues.

Language is both a social and a psychological phenomenon. The basic
function of language is various kinds of communication between
members of a social community.[1] Linguistic data are defined by social
norms. The units and rules underlying data are socially shared, not
private, in nature. On the other hand, the individual members of the
community must have access to the rules in order to communicate or
to be able to produce new, linguistically correct behavior. A language
would cease to exist in at least one important sense if there were no
individuals who knew its units and rules.

Anyone who wants to develop a theory of language must recognize the
inherently socio-psychological nature of the object of study. However, it
is evidently possible to focus on either of the two aspects. In fact, it may
be possible to classify (with Ringen 1975) linguists (philosophers of
language, etc.) into 'non-mentalists', who regard language primarily as
an object with a social or cultural reality,[2] and 'mentalists', who regard it

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[1] Communication defined in a sufficiently wide sense.
[2] In addition, there are of course non-mentalists who do not make any ontological
assumptions at all concerning the nature of the system of units and rules underlying
data. Compare the view of linguistic classification as 'hocus-pocus' (cf. Botha 1968:
107–10 for discussion and references).

primarily as an object with a psychological (mental) reality.[3] Normally, the two positions imply at least partially different opinions on the part of the analysts as to what constraints should be imposed on the theory. For example, non-mentalists would clearly prefer to rely on principles of formal simplicity, economy, etc. in the evaluation of different theories, whereas considerations of 'naturalness' (i.e. realism with respect to hypothesized properties of utterance production and recognition, memory storage, etc.) are not appealed to. Linguists with a predominantly 'social' definition of language are quite often those who prefer to pursue 'autonomous' linguistic analsis (using linguistic-structural evidence and arguments to the exclusion of so-called external evidence).[4]

If it is true, as I think it is, that a 'non-mentalist' theory of language implies that the theory is less constrained by empirical (external) evidence, this can be easily explained in terms of the following, admittedly simplified, account. The basic data, which the linguist as well as the language learner has to start out with, are of course all the specific speech acts or, in a slightly different perspective, all the various spoken or written utterances that they are faced with. Within the data, regularities and relations can be observed, units and structural properties of the combinations of units can be observed or hypothesized. Both the language learner and the linguist assume (perhaps implicitly and explicitly, respectively) that there is an underlying norm defining the linguistically relevant properties of grammatical situation-appropriate speech acts. These properties can be systematized in many ways, i.e. there are many different theories which would predict them. The non-mentalist linguist aims at the construction of a non-redundant exhaustive and consistent theory (systematization) of regularities in the social norm of language (which is *one* plausible interpretation of Saussure's *langue*). However, he does not aim at a theory of the particular way(s) in which language learners internalize *their* knowledge about the norm (mainly because he does not know very much about it).

[3] Actually, this latter group should include all who look at language primarily as something possessed and used by individual speakers, rather than as a supra-individual social entity. All these need not be 'mentalists' in a narrower sense, i.e. they do not necessarily couch it in 'psychological' (phenomenological) terms. Some may treat it in terms of, say, neurophysiological states and processes only.

[4] See Botha (1973: §3.3.1 and passim) for some discussion of internal vs. external evidence. For a tabulation of different kinds of evidence used in generative phonology, see Zwicky (1975a).

A mentalist linguist, on the other hand, is interested also in actual speakers' organization of their linguistic knowledge, and in speakers' ability – with its possibilities and limitations – to create and recreate linguistic utterances, i.e. to produce, perceive and comprehend an unbounded number of speech acts. This clearly means that the theory of language must be subject to further, 'external', conditions, i.e. it must be compatible with theories and facts concerning linguistic performance, language acquisition, linguistic variation and change, etc. as well as about properties of the human biological constitution.

To conclude, I would maintain that an exclusively non-mentalist approach to language yields a lopsided view of language. Though it is a fundamental fact that linguistic rules are social, it is equally important that speakers develop an ability to use language productively, based upon knowledge which is inferred from the publicly observable manifestations of the norm. Speakers' knowledge is established and modified in creative use. Too much emphasis on the system (norm) as such may lead to a picture of language as a closed, static system (*où tout se tient*) rather than as an open, dynamic system. Language is not so much *ergon* as it is 'Form und Potenz einer *energeia*' (Coseriu 1974: 24).[5]

1.2 Attitudes to the goal of psychological reality

Thus we see that the interest in psychological realities on the part of various individual linguists varies considerably. Often, different generations or schools of linguists differ in their attitudes. Broadly speaking, among those who tend to be anti-mentalistic (and often mechanistic, formalistic, or inclined to endorse an abstract view on language) are neogrammarians, Saussure, Hjelmslev, Bloomfield, American structuralists, Chomsky and orthodox generativists (despite claims to the contrary), whereas Humboldt, Paul, Bréal, Sapir, Ščerba, Coseriu and some 'natural generativists' tend to be more concerned with language use, psychological realism and hermeneutics ('*Verstehen*'). Perhaps, one could even discern four different attitudes to claims about psychological reality:

(1) *Radical physicalism :* One claims that there is nothing which can be meaningfully characterized as psychological which cannot be more adequately described as physical or physiological. Therefore,

[5] For a very perceptive treatment of these problems, see Coseriu (1974).

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> talking about psychological reality is nonsense. Moreover, language should be described solely in terms of overt (or non-overt) physical or physiological *events*.

This view is simply incoherent, if interpreted to mean that there is no such thing as an acquired knowledge (ability) to produce grammatical behavior, this knowledge as such being a persistent and structured cognitive state rather than behavioral events (cf. Chomsky 1975a: ch. 1). A view of type (1) may be ascribed to radical behaviorists, although upon closer scrutiny they too introduce 'intervening variables or cognitive (i.e. neurological) states'.[6]

(2)   *Pessimism:* Speakers are assumed to possess knowledge of their language, i.e. a grammar with a more or less specific organization which enables them to use their language correctly, but it is considered to be an unattainable goal to find out what properties these psychological structures have. Therefore, linguists should avoid these problems and do 'autonomous linguistics', i.e. establish linguistic generalizations by purely structural methods. (Language is seen as a system of social norms.)

This is the typical attitude of most structuralists like Hjelmslev, Malmberg, Martinet, Hockett, etc. Some structuralists actually denied that linguistic concepts, like the phoneme, have any psychological counterparts at all (e.g. Twaddell 1935), while most would probably hold that linguistic concepts may have some psychological validity though we cannot hope to find it out with the methods available for linguists. (Maybe psychologists cannot make it out either.)

The goal of psychological reality, i.e. that of accounting for the fully competent speaker's way of organizing his knowledge of his language, implies a strictly synchronic perspective, since speakers have no access to facts about the history of their languages (unless, of course, history has left clear reflexes in the synchronically present language structure). A radicalization of (2), i.e. the pessimistic attitude towards the possibility of investigating psychological realities, would therefore be to deny the possibility of writing *any* kind of strictly synchronic grammar and to claim that historical–diachronic classifications and explanations are the only truly 'scientific' alternative.[7]

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[6]   Cf. my discussion (Linell 1979a) of the similarities between Skinner (1957) and Chomsky.

[7]   Compare, e.g., the formerly common denial that typological classifications may meet scientific standards of objectivity (cf. Greenberg 1973: 169–70). Martinet (1962: 39)

(3)   *Moderate realism:* Speakers are assumed to have organized
       knowledge of their language in some specific ways. To attain
       explanatory adequacy, linguistic theory must strive for realism.
       Biological, psychological and social realities must be taken into
       account (cf. §1.3). However, an investigation of psychological
       realities cannot be pursued with purely linguistic-structural
       methods. Instead, many types of 'external' evidence must be
       exploited (whereby the relevance and reliability of this evidence
       must be critically examined).[8] Also, one needs plausible 'meta-
       physical' assumptions about the nature of language, language
       acquisition and use, the properties of the mind, etc. The latter
       should be an obvious point,[9] though the limited interest in the
       philosophical foundations of linguistic metatheory shows that it is
       not often considered to be so.

I take the view of (3) to be roughly that of, e.g., Derwing (1973)[10] and
many other linguists, including myself, some of which have been or are
still, in some respects, 'generativists'.

(4)   *Naive optimism:* Speakers are assumed to have highly integrated
       and interindividually similar 'mental grammars'. Since many
       irrelevant factors intervene in performance the best way to
       determine mental grammars would then be to apply formal-
       linguistic methods in trying to investigate general and abstract
       conditions on linguistic structures.

This, of course, is Chomsky's position and hence the 'official' view of
many generativists. In many respects, this kind of linguistics is an
extreme form of structuralism or of 'autonomous linguistics' (i.e. a
linguistics which refuses to utilize external evidence).[11] Yet, the claims

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characterized Sapir's (1921) well-known typology as a 'nearly tragic illustration of the
pitfalls of psychologism'.

[8]   For this latter point, see especially Botha (1971, 1973).

[9]   This is particularly stressed in Linell (1974a). See also Lass (1976: 213–20). Cf. §1.6,
       §12.6.

[10] Cf. also Derwing & Baker (1976).

[11] Thus, for scholars inclined to accept (3), Chomsky's 'mentalism' must appear
       'formalistic' and 'dangerously unempirical' (Derwing 1973). (In fact, there is also
       plenty of evidence that it is psychologically invalid, see below). Incidentally, the
       emphasis on formal linguistic methods shows Chomsky's dependence on American
       structuralism. It is interesting to study his formulations in early works prior to his
       becoming a 'mentalist' (see Steinberg 1975 for ample excerpts). Consider Chomsky:
       'The danger in the "God's truth" approach is that it sometimes verges on mysticism,
       and tends to blur the fact that the rational way out of this difficulty lies in the program

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for psychological reality by generativists are surely meant to be taken
seriously (and they should, at least for the sake of argument, be taken
seriously). In fact, the claims about the as yet unknown nature of
psychological reality are very strong indeed: the child is assumed to
internalize a generative transformational grammar.[12] Frequently,
referring to the lack of empirically supported hypotheses about
psychological mechanisms,[13] scholars seem to feel free to assume that
speakers have knowledge of very intricate and abstract relationships.[14]
There is an obvious danger that this makes the notion of 'psychological
reality' (as handled by generativists) completely vacuous and
unempirical.[15]

   Those pessimists (2) who oppose the 'psychologizing' of linguistic
theory have some good reasons. It must be admitted that little can be
known for certain in the area of the psychological reality of language and
that many suggestions are simply subjective, armchair speculation. An
obvious reason for being disenchanted is of course the highly cavalier

of, on the one hand, formulating behavioral criteria to replace intuitive judgments, and
on the other, of constructing a rigorous account of linguistic structure and determining
its implications for particular grammars' (1975b(1955): 103). What Chomsky has done
since 1960 may well be characterized as a pursuit of the second-mentioned
methodological line while assuming that the theory so arrived at is precisely God's
truth!

[12] There is at least one point at which Chomsky in fact confesses that generative
transformational grammar (or at least generative phonology) cannot be psychologically
true. Consider Chomsky & Halle: 'We can therefore state our conclusion about
psychological reality only in hypothetical form: *if it were the case that language
acquisition were instantaneous, then the underlying forms with pre-Vowel shift
representations would be psychologically real*' (1968: 332) (their italics). Usually,
Chomsky and other generativists do not refer to this proviso when discussing problems
of psychological reality. Moreover, 'the instantaneous model ... can very well be
accepted as a reasonable first approximation' (Chomsky 1967b: 441, fn. 41). For
discussion of another theory of language acquisition that may be compatible with
OGPh, see §12.3.2.

[13] For this lack of knowledge psychologists, not linguists, should be blamed, according to
some generativists' doctrine (cf. Derwing 1973: 278–81).

[14] Cf. for example, Lightner: 'In the absence of a major breakthrough in some field like
psychology or neurophysiology, it is not clear what limits to impose on the abstractness
of grammar.' Meanwhile, 'we will surely be interested in abstract grammars because
these grammars will be the most interesting from a theoretical point-of-view' (1971:
524).

[15] Consider, e.g., Fromkin: 'Rather than testing each grammar to see if it is
psychologically real, it seems to me that we are looking for evidence concerning the
general form of grammars ... A rule of phonology is, according to this view,
psychologically real if it is permitted by the general theory which places constraints on
the kinds of rules and the form of rules which can occur in any language' (1975: 46–7).

manner in which many orthodox generativists have advanced mentalistic claims to the effect that the rule formulations that they, as linguists, have arrived at, most often by purely structural methods, are also the rules of *speakers'* internalized grammars (cf. (4)-type optimism). Admittedly, this is largely true also of proposals made by more 'moderate realists' (3). For example, Roberts (1976: 219, fn. 2) has pointed out that many of the arguments against abstract phonological representations are simply based on the fact that the linguists who proposed such forms have gone beyond the limits of their critical colleagues' tolerance. While I would not pretend that this critique is completely misguided, it cannot be said to be the whole truth. Arguments are also often, and should always be, backed up by a considerable amount of evidence which cannot simply be ignored. As far as the general theory is concerned, one can at least strive for a theory that is psychologically and behaviorally interpretable and that is plausible given some well-founded assumptions about the functioning of the mind. This is, in all modesty, the goal towards which the present work is directed.

While it must be conceded that one *can* argue for the standpoint of 'pessimism' (2), it must also be pointed out that most, if not all, linguists seem to impose *some* constraints on their linguistic descriptions which, I would claim, have to do with their intuitive feeling of what is psychologically acceptable or not. Malmberg who shares the aversion of structuralists towards 'psychologizing'[16] in the discussion of linguistic structure objects to the proposal to represent prevocalic [ʃ] sounds in some Swedish dialects as /rs/ or /sr/ which are possible analyses since neither *[rs] nor *[sr] occur prevocalically on the surface. Moreover, the /sr/ solution could be subsumed under the 'mirror effect'; prevocalic clusters tend to be reversed with respect to postvocalic clusters.[17] Malmberg's (1969) motivation is that 'this interpretation is inadmissible and is opposed to an elementary principle of phonemicization; one should not impose upon language a structure type, the only instance of which is the type which is created by the interpretation'.[18] However, why does he accept this constraint, when it excludes the formulation of a possible generalization ('the mirror effect')? Obviously because it seems

[16] For example, Malmberg (1969: Öhman 3, fn. 1).
[17] There are reasons to represent postvocalic [ʂ, ʃ] as /rs/ in the dialects concerned. The solutions discussed have been suggested by Elert (1957), and Witting (1959).
[18] My translation of Malmberg's Swedish manuscript (1969: Elert 2).

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intuitively wrong; there is no reason to assume that speakers internalize a non-functional rule reversing /sr/ clusters to /rs/ clusters (and a rule /rs/ → [ʃ]/__V) (or in general: abstract analyses which have no reasonable behavioral motivation whatsoever).

1.3 Reasons to adopt the goal of psychological reality

To provide a theory of the speaker's organization of linguistic knowledge is of course a goal in itself. From a methodological point-of-view, one may wish a theory to make strong claims and thus to be easily susceptible to falsification. If so, a 'mentalistic' theory is preferable to a 'non-mentalistic' one (cf. Botha 1968: 103), since there are many more data which could falsify the former one (cf. §1.1). More important, however, is the fact (also indicated in §1.1) that one cannot arrive at a plausible overall understanding of the nature of language, its structure and functions, without considering the psychological aspects. For example, conditions on the production and perception of strings may explain why certain syntactic structures are excluded, while others are preferred (cf. for example, Anward 1979). Linguistic changes may be explained by the possibilities that different groups of speakers (who have, perhaps, been exposed to qualitatively and quantitatively different sets of data) make different perceptual analyses of the same linguistic data.[19] The kind of linguistic theory needed in the description and explanation of language acquisition, foreign language learning, speech performance (including, e.g., speech errors and aphasia) must of course be psychologically adequate. Moreover, if we want linguistics to be of value for cognitive psychology (as proposed by Chomsky 1968) and if we want linguistic knowledge and behavior to be used as a 'window to the mind' (Lashley 1951), then one can hardly use a linguistic theory which is not psychologically and behaviorally interpretable and plausible.

1.4 The concept of psychological reality

Problems connected with psychological reality concern not only the lack of reliable empirical data. The concept of 'psychological reality' as such is fraught with a number of problems of interpretation. I will briefly mention some of these problems.

[19] Cf. for example, the theory of abduction of Andersen (1973).

1.4.1 *Degree of representationalism*

A 'psychologically real' grammar is supposed to be a theory of covert psychological abilities underlying speakers' linguistic practice. It concerns the speakers' knowledge of the socially endorsed rules that define correct linguistic behavior. Clearly, a psychologically adequate grammar must meet the following conditions:

(a)   To the extent that the conventions of the language are deter-minate, it must generate all and only the grammatical utterances of the language[20] and assign to these their correct pronunciations, meanings and grammatical properties.

(b)   In doing so it must reflect the competent speaker's way of organizing his knowledge of his language. That is, the *internal structure* of the grammar must *be isomorphic to* the speaker's *underlying psychological structure* with regard to individuation (what different forms, in particular what different lexical units, there are), properties of the forms, relations between and generalizations over the forms, derivative capacity (what forms can be derived and what the properties and interrelations of these are).

This means, for example, that the phonology of a lexical unit must be represented in the grammar in such a way that the properties of the psychologically real form are systematically reflected. If, e.g., the word *pipe* is grammatically represented as /pīp/ (cf. Chomsky & Halle 1968),[21] i.e. as a feature matrix with three columns and certain feature specifications for each column (defining the segments of /p/ and /ī/), the internal isomorphy condition (b) amounts to a claim that there is a psychologically real structuring (at some level) such that it contains precisely three segments, the first and last of which are identical in type, the second of which *is* actually [+vocalic, −consonantal, +high, −back, +tense, etc.] while the first and third ones *are* actually [−vocalic, −sonorant, −voiced, +anterior, −coronal, −continuant, etc.].

I will give one example more. An English speaker may note that there are numerous cases of regular morphophonological vowel alternations in English, such as [aî]–[ɪ] (*divine* – *divinity*), [îĵ]–[e] (*serene* – *serenity*), [êî]–[æ](*sane–sanity*). Orthodox generative phonology expresses this by

[20] The utterances which the speaker considers to be correct in the language.
[21] Here, and in subsequent discussions of Chomsky & Halle (1968), I disregard the fact that they consider English long tense vowels (e.g. in *pipe*, *meat*) to be underlying tense (e.g. ī, ē/ etc.) rather than long (i.e. /iː, eː/ etc.).

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setting up morpheme-invariant underlying forms and deriving the surface vowels by rules. However, this theory is not just an arbitrary way of expressing a regular morphophonological relation (one kind of description out of several possible alternatives); much more is claimed. When, for example, *sane* [sêɪn] is represented as /sāēn/ (Chomsky & Halle 1968: 178ff) and the surface vowel is derived by rules (vowel shift, diphthongization), the internal isomorphy condition (b) above means that *sane has actually* in a real mental world (the memory?) a low, non-diphthongized vowel (not a non-high, non-low diphthongized vowel), and that the rules have *some* kind of counterpart in the mental processes needed in the production or perception of the sound shape corresponding to *sane*.

Two grammars may of course be equivalent with respect to condition (a),[22] while only one of them tries to meet (or succeeds in meeting) condition (b).[23] Only the latter is a true *representational model* of the covert mental reality.[24]

[22] Such grammars are 'weakly equivalent' (Bach 1964: 159) or 'extensionally equivalent' (Quine 1970, cf. Chomsky 1975a: 179ff).

[23] Actually, several grammars may be psychologically valid, cf. §1.5.6, p. 25, fn. 58.

[24] To simplify the matter considerably, we may distinguish two different opinions as to the nature of a theory and its entities and processes and their relations to the world. (Actually, we are here classifying several opinions into two groups.) According to one conception, usually referred to as *realism* (e.g. Botha 1968; Harré 1972) or *representationalism* (cf. Bunge 1964), the theoretical entities and processes refer to real (though most often non-observable or inaccessible) entities and processes which are assumed to stand in a causal relation to the observable phenomena. Thus, the theory would depict or represent an inaccessible reality (cf. Bunge 1964: 234). The other way of looking at theories, called *fictionalism* (Harré 1972), *instrumentalism* (Botha 1968), *constructivism* (Wartofsky 1968) or even *black-boxism* (Bunge 1964), claims that the theory with all its components is merely a useful fiction which expresses generalizations over or relationships between the observable phenomena. Then, the theory is just 'a more effective tool for summarizing and predicting observations' (Bunge 1964: 234). The theoretical entities are only 'imaginary constructs which we invent to aid our understanding' or are used 'to name characteristic configurations of observed properties economically' (Wartofsky 1968: 283). Naturally, we must admit several types of theories, from the completely fictionalistic ones to those which are almost totally representational. That is, 'a realist does not maintain that *every* hypothetical entity exists' (Harré 1972: 90) (my italics).

The discussion of representationalism vs. fictionalism of theories as summarized here is usually confined to theories of natural sciences. By 'theory' we would then understand a system of theoretical, i.e. non-observable, entities and processes (*explanans*), which underlie (generate) the observable phenomena to be explained (*explananda*) (cf. Hempel 1966: 77). However, one may make use of the distinction in discussing '*Verstehen*' theories of the human sciences too, in which theoretical concepts explicate relations and properties of, say, a cognitive (cultural, linguistic, etc.) system of