

EXTERNAL LINGUISTIC EVIDENCE: A NONFALSIFICATIONIST VIEW

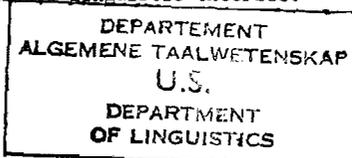
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1. Introduction

What role should external linguistic evidence,<sup>1)</sup> i.e., evidence about phenomena such as speech production and perception, language acquisition, language change, speech pathology, etc., play in the evaluation of linguistic theories? That this question is a highly controversial one is evidenced by the fact that it is widely discussed in the literature and that many conflicting answers have been provided for it.<sup>2)</sup>

One of the contexts<sup>3)</sup> in which the issue of external linguistic evidence (henceforth "external evidence") arises, is that of debates about the psychological reality of the theoretical constructs postulated by mentalistic linguistic theories.<sup>4)</sup> The question which is usually considered in such debates is that of the role that external evidence should play in evaluating the truth or falsity of claims about psychological reality. On the basis of the different answers provided to this question in the literature, the following three positions on the use of external evidence in the evaluation of mentalistic linguistic theories can be distinguished:

- (1) a. External evidence cannot be used to evaluate mentalistic linguistic theories, i.e., the use of external evidence in the evaluation of mentalistic linguistic theories is ruled out a priori.<sup>5)</sup>
- b. External evidence can be used to evaluate mentalistic linguistic theories (i.e., its use is not ruled out a priori as in (1)a.), but it is not necessary to use such evidence, and such evidence has no "privileged"/special status in the evaluation of mentalistic linguistic theories.<sup>6)</sup>



c. External evidence must be used to evaluate mentalistic linguistic theories, and such evidence has a "privileged"/ special status in the evaluation of mentalistic linguistic theories.<sup>7)</sup>

It is generally assumed<sup>8)</sup> that the methodology underlying generative grammars --- in particular, Chomskyan linguistics --- is a falsificationist one. That is, it is assumed that the empirical status of linguistic theories depends on their being falsifiable in principle. The positions (1)a., (1)b., and (1)c. formulated above, may be seen as representing two conflicting views on the conditions under which mentalistic linguistic theories can be regarded as empirical in the sense of falsifiable in principle. The first and second positions represent the view that mentalistic linguistic theories can have an empirical status even if external evidence is not regarded as potential disconfirming evidence for such theories. The third position represents the view that external evidence must be regarded as potential disconfirming evidence for mentalistic linguistic theories, if the empirical status of such theories is to be guaranteed. There seem to be strong arguments in favour of the latter view. One of the most recent works in which detailed arguments for this view are presented is (Botha 1979b).<sup>9)</sup>

Suppose we accept that within the falsificationist framework the empirical status of mentalistic linguistic theories depends on the availability in principle of external evidence as potential disconfirming evidence. It then follows that a linguist cannot, without being inconsistent, simultaneously adopt the falsificationist methodology, claim that mentalistic linguistic theories have an empirical status, and deny that external evidence must be regarded as potential disconfirming evidence for mentalistic linguistic theories. Faced with this consequence, a linguist who is reluctant or unwilling to accept that external evidence can reflect negatively on the merit of a linguistic theory has the following three options:<sup>10)</sup>

- (i) The linguist can give up the claim that mentalistic linguistic theories have an empirical status.
- (ii) The linguist can give up the claim that linguistic theories must be interpreted as mentalistic theories.

- (iii) The linguist can reject falsificationism, and adopt an alternative, nonfalsificationist methodology that will allow him to ignore external evidence in the evaluation of mentalistic linguistic theories.

Choosing the first option entails that mentalistic linguistics must be regarded as a metaphysical enterprise. Mentalistic linguistics would then be an enterprise essentially different from, e.g., natural science. Choosing the second option entails that linguistic theories must be interpreted as nonmentalistic theories which express no claims about psychological reality. External evidence would be irrelevant to the evaluation of such nonmentalistic theories. Consequently, such evidence could not be used as potential disconfirming evidence for nonmentalistic linguistic theories.<sup>11)</sup>

The aim of the present study is to consider the third option outlined above in more detail. The general question which this study attempts to answer can be formulated as follows:

- (2) Will the adoption of a nonfalsificationist methodology necessarily enable a mentalistic linguist to ignore the data which yield external evidence in the evaluation of mentalistic linguistic theories?

This study provides a partial answer to this general question by focusing on one particular nonfalsificationist methodology, viz. Larry Laudan's progressive problematism. It will be argued below that adoption of Laudan's progressive problematism does not enable a linguist to ignore external evidence in the evaluation of mentalistic linguistic theories. Thus, the answer which this study provides to the general question formulated above is that adoption of a nonfalsificationist methodology will not necessarily enable a linguist to ignore external evidence in the evaluation of mentalistic linguistic theories. There is at least one nonfalsificationist methodology, viz. progressive problematism, that does not allow the mentalistic linguist to ignore such external evidence.

2. An outline of progressive problematist

Laudan's philosophy of science, as set out in his book Progress and its problems (1977), is based on the assumption that the aim of science is the solution of problems. Progress in science is directly linked to the solution of problems. For Laudan, progress consists in increasing the problem-solving effectiveness of theories (hence the term "progressive problematist"). Within the framework of progressive problematist, theories are viewed as constructs set up to solve specific problems, that is, as Laudan (1977:13) puts it, "theories matter, they are cognitively important, insofar as --- and only insofar as --- they provide adequate solutions to problems". Laudan (1977:13) gives the following informal characterization of what it means for a theory to be a solution to a problem:

- (3) "The function of a theory is to remove ambiguity, to reduce irregularity to uniformity, to show that what happens is somehow intelligible and predictable; it is this complex of functions to which I refer when I speak of theories as solutions to problems."

The problem-solving effectiveness of a theory is a function of the following variables:

- (i) the number and importance of the empirical problems the theory solves;
- (ii) the number and importance of the anomalies and conceptual problems which the theory generates.

Laudan (1977:68) proposes the following evaluation measure for calculating the problem-solving effectiveness of a theory.

- (4) "The overall problem-solving effectiveness of a theory is determined by assessing the number and importance of the empirical problems which the theory solves and deducting therefrom the number and importance of the anomalies and conceptual problems which the theory generates."

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Thus, in terms of (4), a proponent of a theory should aim at maximizing the number of important empirical problems solved by his theory and minimizing the number of anomalies and conceptual problems generated by this theory. At least the following concepts featuring in (4) must be clarified: the concepts 'empirical problem', 'conceptual problem', 'anomaly', and 'importance of a problem or anomaly'.

Empirical problems are roughly defined by Laudan (1977:15) as "problems about the natural world". Conceptual problems are problems exhibited by some theory. Conceptual problems have no existence independent of the theories which exhibit them. Empirical problems have at least a limited autonomy.<sup>12)</sup> Laudan (1977:48) characterizes the distinction between empirical problems and conceptual problems as follows: the first type of problem represents "first order questions about the entities in some domain", while the latter type represents "higher order questions about the well-foundedness of the conceptual structures (e.g., theories) which have been devised to answer the first order questions". Two types of conceptual problems are distinguished: internal conceptual problems, i.e. problems arising from inconsistencies and vagueness internal to a theory, and external conceptual problems, i.e. problems arising from a conflict between a theory and some other well-founded theory or doctrine.

The notion 'anomaly' traditionally concerns a logical inconsistency between the predictions of a theory and some set of data, i.e., the refuting instances. Laudan (1977:28-30) argues for a less restricted view of anomalies that will allow the existence of a class of nonrefuting anomalies. This latter type of anomaly is characterized as follows by Laudan (1977:29):

- (5) "Whenever an empirical problem, p, has been solved by any theory, then p thereafter constitutes an anomaly for every theory in the relevant domain which does not also solve p."

On this view of anomalies, a problem p can constitute an anomaly for a theory T even if T is not logically inconsistent with p. This will be the case where T makes no prediction at all with respect to p, while an alternative theory T' in the relevant domain has solved p. The notion 'anomaly' with which Laudan operates differs from the more traditional notion in a second respect. Traditionally, all refuting in-

stances count as anomalies for a theory T, i.e., all refuting instances of a theory pose a cognitive threat to this theory. For Laudan, a refuting instance will count as an anomaly only if some alternative theory in the relevant domain happens to solve the problem concerned. Thus, an unsolved empirical problem p will count as an anomaly for a theory T only if some alternative theory T' in the relevant domain happens to solve p.

It is not necessary to expound on the factors which determine the importance of a problem.<sup>13)</sup> Briefly, it may be noted that these factors are such that the relative importance of any problem may fluctuate in time. Thus, a problem which is relatively unimportant at some point in time may be of considerable importance at some later point in time, and vice versa.

Within the framework of progressive problematism, progress and problem-solving effectiveness (as determined on the basis of (4)) are directly linked. Progress, according to Laudan (1977:68), can occur if, and only if, a succession of scientific theories shows an increasing degree of problem-solving effectiveness. If the idea of progress is localized to a specific situation then, according to Laudan (1977:68), "we can say that any time we modify a theory or replace it by another theory, that change is progressive if and only if the later version is a more effective problem-solver .... than its predecessor". It should be clear from this linking of progress to Laudan's concept of problem-solving effectiveness, that progress need not consist only in an increase in the number of solved empirical problems. A decrease in the number of the anomalies and/or conceptual problems confronting a theory could also constitute progress.<sup>14)</sup>

Laudan defines the concept 'rationality' in terms of the concept 'progress'. As he (1977:125) puts it: "to make rational theory choices is, on this view, to make choices which are progressive ....". In choosing between two alternative theories, it would be rational to choose as the best theory the one which is the most effective problem-solver. Conversely, to choose the less effective problem-solver of two alternative theories would be to act irrationally.

Two complications concerning the role played by theory evaluation in the framework of progressive problematism must briefly be noted here. The

first complication concerns the nature of the entity that must be evaluated. Laudan accepts the insight provided by the work of Kuhn and Lakatos, viz. that, apart from specific theories, more general theoretical frameworks must also be appraised. Laudan uses the term "research tradition" (henceforth RT) to denote these larger, more general theories. Laudan (1977:81) roughly defines an RT as "a set of general assumptions about the entities and processes in a domain of study, and the appropriate methods to be used for investigating the problems and constructing the theories in that domain".<sup>15)</sup> Any RT will include many specific theories, some of which will be mutually inconsistent. The merit of an RT is a function of the problem-solving effectiveness of the specific theories within that RT.<sup>16)</sup>

A second complication concerning the role of theory evaluation within progressive problematism, arises from the fact that Laudan distinguishes two quite different contexts for the evaluation of theories and RTs. Firstly, there is the context of acceptance. In this context the question at issue is what theory or RT is the best. To determine which theory or RT is to be accepted as the best, one simply determines which theory or RT among the available alternatives has the most problem-solving power. Secondly, there is the context of pursuit. Laudan invokes this second context to account for the fact that it may be quite rational to work within an RT that has a lower problem-solving effectiveness than its rivals. That is, even if a particular RT cannot be shown to be superior in problem-solving effectiveness, it may still be rational, under certain circumstances, to keep on working within that RT. Laudan (1977:111) states that the pursuit of an RT is always rational if it has a higher rate of progress than its rivals. Pursuit of an RT that is not the best available problem-solver is, according to Laudan, especially appropriate in the case of relatively new RTs.<sup>17)</sup>

### 3. Progressive problematist and progressive mentalism

#### 3.1 General remarks

Botha (1979b:58) characterizes a progressive mentalism as "a form of mentalism which represents an empirical and fruitful approach to the study of natural language(s)". The basic question with which §3 deals can be formulated as follows in terms of this notion of progressive mentalism:

- (6) Given the framework of progressive problematist, must a form of mentalism be responsible to external linguistic data in order to be progressive?

(To say that a theory is responsible to a particular set of data means, roughly, that this set of data is in some way involved in the evaluation of the theory.) (Botha 1979b) is partly an attempt to show that, within a falsificationist framework, Chomskyan mentalism must be responsible to external linguistic data in order to be progressive. In particular, it is shown that external linguistic data must constitute (dis)confirming evidence for mentalistic linguistic theories. In the rest of §3 I will attempt to show that, within the progressive problematist framework, mentalism must also be responsible to external linguistic data in order to be progressive. There is, however, an important difference between the falsificationist and the progressive problematist frameworks. Within the falsificationist framework, the central notion in the evaluation of a theory is that of (dis)confirming evidence. Within the progressive problematist framework, the central notion is that of the (un)solved problem. Thus, to say that within the progressive problematist framework a mentalistic linguistic theory must be responsible to external data, does not mean that this kind of data constitutes (dis)confirming evidence for the theory. Rather, it means that the problems raised by this kind of data are relevant to the evaluation of the theory. In §3.2 I briefly discuss the notion 'linguistic problem', and distinguish between external and internal linguistic problems.

### 3.2 Internal vs. external linguistic problems

The distinction between internal (linguistic) evidence and external (linguistic) evidence plays an important role in generative grammar.<sup>18)</sup> Internal evidence is yielded by the linguistic intuitions of speakers of a language. This type of evidence is called "internal", because it comprises data about objects internal to the linguistic reality, as this reality is defined by the abstractions and idealizations<sup>19)</sup> employed by the generative grammarian. In the discussion below, the term "internal (linguistic) data" will be used to denote data which constitute internal linguistic evidence. External evidence comprises data about objects, processes, etc., outside the linguistic reality as defined by the relevant abstractions and idealizations. This type of data will be referred to as "external (linguistic) data" below. External data include data about the actual use of linguistic competence in speech production and perception, language change, the acquisition of language by a child, speech pathology, etc.

Given the above distinction between two types of linguistic data, two types of linguistic problems can be distinguished: (i) internal (linguistic) problems, i.e., problems raised by internal data, and (ii) external (linguistic) problems, i.e., problems raised by external data. Internal problems concern the state of knowledge a speaker-listener has that enables him (in conjunction with other systems of knowledge) to use his language creatively, and the ability of the speaker-listener to acquire this knowledge. In the terminology of (Chomsky 1976:3) and (Chomsky 1978:7-8), we can say that the fundamental problem of linguistics is to account for the initial and final states of the language faculty with universal grammars set up to account for the initial state and particular grammars set up to account for the various final states. External problems concern the use of linguistic competence in speech production and perception, the way languages change, the acquisition of language by a child, etc.

From the exposition above, it is clear that there is a relation between internal evidence and internal problems, and between external evidence and external problems. These relations can be expressed in terms of the distinction between internal and external linguistic data. Internal lin-

linguistic data constitute internal evidence, and also raise internal problems. External linguistic data constitute external evidence, and also raise external problems. Given these relations, it is possible to "translate" statements about evidence within the falsificationist framework into statements about problems within the progressive problematist framework. Thus, the statement "Internal data constitute (dis)confirming evidence for mentalistic linguistic theories" is equivalent to the statement "Internal data raise problems which are relevant to the evaluation of mentalistic linguistic theories". Analogously, the statement "External data constitute (dis)confirming evidence for mentalistic linguistic theories" is equivalent to the statement "External data raise problems which are relevant to the evaluation of mentalistic linguistic theories". The first pair of equivalent statements bear on internal evidence and internal problems, respectively. The second pair of equivalent statements bear on external evidence and external problems, respectively. Against this background, it is clear that the question (5) is in fact a question about the relevance of external problems to a progressive mentalism.

### 3.3 The Distinctness Condition

Botha (1979b: Chapter 5) discusses various conditions which a form of mentalism must satisfy in order to be progressive within a falsificationist framework. One of these conditions, however, is not limited to the falsificationist framework. This is the "Distinctness Condition", characterized by Botha (1979b:58) as "the most fundamental of the conditions which any form of mentalism must meet in order to be progressive". He (1979b:58) formulates this condition as follows:

- (7) "The Distinctness Condition: In order to be progressive, any form of mentalism must be distinct, in significant respects, from a methodologically non-objectionable form of nonmentalism."

Botha (1979b:58) emphasises the importance of this Distinctness Condition, claiming that "... any form of mentalism which failed to meet The Distinctness Condition would, in essence, be either a metaphysical system or

an elaborate terminological game".<sup>20)</sup>

The formulation (7) of The Distinctness Condition gives rise to the question: In what significant respects must a progressive mentalism differ from a methodologically non-objectionable form of nonmentalism? (Following Botha (1979b:58), the expression "(minimally) acceptable" will henceforth be used in the sense of 'methodologically non-objectionable'.) As Botha (1979b:59) points out, different philosophies of science differ in what they single out as the significant properties of science. Consequently, within the frameworks of the different philosophies of science different answers will be given to the question posed above. For purposes of the present study, we are interested only in the answer that must be given to this question within the framework of progressive problematism. Before we can consider this answer, however, we must consider the essence of a minimally acceptable form of nonmentalism.

### 3.4 An acceptable form of nonmentalism

In his discussion of the significant respects in which a progressive mentalism must differ from an acceptable form of nonmentalism, Botha (1979b: 59) refers to a form of nonmentalism that he takes to represent such an acceptable form of nonmentalism. This form of nonmentalism is the view called "Platonism" or the "Platonist Position" by Katz (1977:562 f). Let us assume, for the purpose of the present study, that Platonism does indeed represent a minimally acceptable form of nonmentalism.

According to Platonism "grammar is an abstract science like arithmetic" (p.562).<sup>21)</sup> The goal of a Platonist grammar is not to characterize real entities such as idealized mental objects or processing systems (p.565-6). Rather, its goal is to depict "the structure of abstract entities" (p. 566). This choice of goals entails that a Platonist grammarian does not impute existence to the theoretical constructs of his grammar or claim psychological reality for them; i.e., this choice of goals entails that Platonist linguistic theories are nonmentalistic.

According to Katz (1977:565), the facts to which Platonist grammars are "required to respond" are provided by linguistic intuition. Thus, in the

terminology of §3.2, the data to which Platonist grammars are required to respond are internal linguistic data. In the terminology of progressive problematist, one can then say that Platonist grammars are expected to solve the problems raised by internal data, i.e., internal linguistic problems.

The Platonists take the source of the data provided by linguistic intuition to be psychological, but not their import. That is, on the Platonist view it is not the case that intuitions convey information about psychological objects, states, or events (p. 565). Platonists, accordingly, consider external data about on-line operations to be irrelevant to their grammars. This is to say that "information about errors and reaction times for performance tasks ... has the wrong import" (p. 565). In the terminology of progressive problematist, one can then say that Platonist theories are not required to solve the problems raised by external linguistic data. Consequently, Platonist theories cannot be evaluated on the basis of their failure or success in solving external problems.

Within the framework of progressive problematist, Platonism represents a minimally acceptable form of nonmentalism in that it aims at the solution of an identifiable class of empirical problems, viz. the class of internal linguistic problems.

### 3.5 External linguistic problems and the difference between an acceptable form of nonmentalism and a progressive mentalism

Having outlined the essence of Platonism as a minimally acceptable form of nonmentalism, we can now return to our initial question: What are the significant respects in which a form of mentalism must differ from a minimally acceptable form of nonmentalism in order to be progressive? For progressive problematist, the most significant property of theories is that they are set up to solve empirical problems. Thus, recall that according to Laudan (1977:13) "theories matter, they are cognitively important insofar as --- and only insofar as --- they provide adequate solutions to problems". Given this emphasis on theories as solutions to empirical problems, it seems then that a progressive mentalism must differ from an acceptable form of nonmentalism with respect to the empirical problems it attempts to solve.

Any mentalistic theory is initially set up to solve internal linguistic problems. Consider, for instance, Chomsky's statement (1976:3; 1978:7-8) that the fundamental problem of linguistics is to account for the initial and final states of the language faculty. Thus, any form of progressive mentalism will aim at the solution of internal problems, and such problems will be relevant to the evaluation of mentalistic linguistic theories proposed within this mentalistic tradition. It was pointed out in §3.4 that Platonism, an acceptable form of nonmentalistic, also aims at the solution of internal linguistic problems. Since both a progressive mentalism and an acceptable form of nonmentalistic aim at the solution of the same set of internal problems, no distinction can be made between such a mentalism and such a nonmentalistic with reference to the class of internal problems. There is, however, a second class of linguistic problems on the basis of which the necessary distinction between a progressive mentalism and an acceptable form of nonmentalistic could be made. It was pointed out in §3.4 that an acceptable form of nonmentalistic such as Platonism does not aim at the solution of external problems, and that, consequently, external problems are irrelevant to the evaluation of nonmentalistic linguistic theories. If progressive mentalism were to aim at the solution of external problems, then we would have a significant difference between progressive mentalism and an acceptable form of nonmentalistic. Progressive mentalism would then differ from an acceptable form of nonmentalistic in that the former, but not the latter position would, in addition to the class of internal problems at which both traditions are directed, also aim at solving external problems. Consequently, external problems would be relevant to the evaluation of progressive mentalistic theories, but not to the evaluation of theories proposed within the framework of a form of nonmentalistic such as Platonism.

In sum: we would have a significant difference between a progressive mentalism and an acceptable form of nonmentalistic if a progressive mentalism aimed at the solution of both external problems and internal problems. Recall that internal problems cannot serve as a basis for differentiating between a progressive mentalism and an acceptable form of nonmentalistic, since both aim at the solution of such problems. We can then conclude that, within the framework of progressive mentalism, a progressive mentalism which is to differ significantly from an acceptable form of nonmentalistic must aim at the solution of both external problems and internal

problems. Given this conclusion, it has been demonstrated that the answer to question (5) must be in the affirmative. It is indeed the case that within the framework of progressive problematism a form of mentalism must be responsible to external linguistic data in order to be progressive.

### 3.6 A potential counterexample: Competencism

Katz (1977) advocates a mentalist view that could constitute a counterexample to the claim made in §3.5, i.e., that a progressive mentalism must aim at the solution of external problems if it is to differ significantly from an acceptable form of nonmentalism. According to Katz (1977:562) this view, so-called "Competencism", "envisions a theory of language that bases grammars on the idealization of the objects hypothesized to account for the internal evidence". He (1977:563) also says, "Competencism claims that idealizations in grammars proceed only from intuitions of grammatical properties and relations. Data pertaining to the nature of events in tasks involving high speed operations, such as errors and reaction times, do not enter into the evidential constraints in grammar construction. Such events are different in kind from mental acts of inner apprehension". Katz's position entails that external data are not relevant to the evaluation of mentalistic theories.<sup>22)</sup> In the terminology of progressive problematism Katz's position entails that mentalistic theories need not solve external problems, and that such problems are thus irrelevant to the evaluation of mentalistic theories.

It seems then that Competencism does not differ significantly from an acceptable form of nonmentalism in the crucial respect, viz. that of aiming at the solution of additional, external problems. It might, however, be argued that Competencism still satisfies The Distinctness Condition presented as (7) above. It might be claimed that Competencism differs significantly from a form of nonmentalism, such as Platonism, in that it interprets the internal linguistic data differently. Recall that the term "internal data", as it is used here, refers to data yielded by linguistic intuition. According to Katz (1977:565), Competencism and Platonism differ in their interpretation of such data. Recall that Platonism

takes the source, but not the import, of such data to be psychological. Competencism, by contrast, takes both the source and the import of such data to be psychological. The crucial question is whether this difference in interpretation could be construed as a significant difference between Competencism and Platonism on the basis of which Competencism could qualify as a progressive mentalism in terms of *The Distinctness Condition*. It seems as if the answer to this question must be in the negative. As Botha (1979b:93-4) points out, Katz does not show that Competencism, in virtue of its different interpretation of internal data, generates and solves a single linguistic problem which cannot be posed or solved within the framework of Platonism. Therefore it does not seem to be the case that Competencism meets *The Distinctness Condition* (7). Consequently, Competencism cannot be considered as a progressive mentalism which is exempt from the requirement that it must also solve external problems.<sup>23)</sup>

### 3.7 A potential conceptual problem: The Mentalist-Rationalist Paradox

It has been argued above that a progressive mentalism must be responsible to external data. In particular, it has been argued that a progressive mentalism must aim at the solution of external problems, and that such problems are thus relevant to the evaluation of mentalistic theories. It could now be argued that, given the role assigned to external data in the evaluation of mentalistic theories, linguistic theories can no longer be regarded as theories about idealized mental objects, but that such theories must now be regarded as unified theories of linguistic competence, speech perception and production, language acquisition, language change, etc. In short, it could be claimed that the progressive problematist view on the relevance of external problems to a progressive mentalism is in conflict with the rationalist thesis underlying Chomskyan linguistics.<sup>24)</sup> This conflict would constitute a serious conceptual problem for a progressive mentalism.

Botha (1979b:38-9) argues that an analogous problem arises within the falsificationist framework. He calls this problem "The Mentalist-Rationalist Paradox".<sup>25)</sup> Since the nature of the problem that arises within the

falsificationist framework is in all significant respects equivalent to the problem which arises within the progressive problematist framework, I will take over the term "The Mentalist-Rationalist Paradox" from (Botha 1979a).

Is there a way of resolving the conceptual problem called The Mentalist-Rationalist Paradox? In particular, must the rationalist thesis be rejected to provide for the evaluation of progressive mentalism on the basis of its ability to solve external problems? It is in fact quite easy to demonstrate that rejection of the rationalist thesis does not follow from a progressive problematist interpretation of progressive mentalism.

Laudan (1977:25) states that any theory can be regarded as having solved an empirical problem if this theory functions significantly in a scheme of inference whose conclusion is a statement of the problem. This clearly allows for the possibility that more than one theory may be involved in the solution of a problem. Moreover, Laudan (1977:43) proposes that the credit for solving any empirical problem should be spread evenly among the members of the complex of theories involved in solving that problem.

These remarks about the way in which complexes of theories can be involved in the solution of empirical problems, provide the key to the solution of The Mentalist-Rationalist Paradox. Given a mentalistic theory T which manages to solve some external problem in conjunction with other theories, then T will be given credit for having solved this external problem. Included in the complex of theories involved in solving the external problem would be so-called "bridge theories".<sup>26)</sup> The task of these bridge theories is to specify in detail the way in which the language faculty is involved in external linguistic phenomena such as speech perception and production, language change, speech pathology, etc. Given the existence of such bridge theories, linguistic theories can be regarded as characterizations of idealized mental objects, and at the same time be evaluated on the basis of their success in solving external problems. In short, it becomes possible to adopt the rationalist thesis and at the same time to accept that a progressive mentalism must aim at the solution of external problems.<sup>27)</sup>

#### 4. Progressive problematist theory evaluation: an illustration

In §3 it has been argued that for the progressive problematist, external problems are relevant to the evaluation of mentalistic linguistic theories. In this section my aim is to make more concrete the abstract principles set out in §3. To achieve this, I will give an illustration of the role which external problems play in the evaluation of mentalistic theories. I will also point out some of the complications that may arise in the course of such theory evaluations. We shall consider the two semantic theories discussed by Fodor, Fodor, and Garrett (henceforth FFG) in their article "The psychological reality of semantic representations" (1975). The two theories are rival theories about the representation of the meaning of lexical items.<sup>28)</sup>

The first theory stipulates that the meaning of a lexical item must be represented in a semantic representation which takes the form of an eliminative definition. Thus, at the level of the semantic representation, the meaning of the lexical item bachelor will be specified by a definition such as "unmarried, adult, male human". Entailment relations --- such as the one that exists between John is a bachelor and John is an unmarried man --- would then be defined over semantic representations. Let us refer to this theory about the representation of the meaning of lexical items as "The Definitional Theory".<sup>29)</sup>

According to the second theory, the representation of the meaning of lexical items must not take the form of eliminative definitions. Rather, the meaning of lexical items must be represented by means of meaning postulates. The grammar of English would then contain a meaning postulate which states that  $x$  is a bachelor only if  $x$  is an unmarried man. The entailment relation between John is a bachelor and John is an unmarried man will then be captured by this meaning postulate. In the discussion below, this theory will be referred to as "The Meaning Postulate Theory".<sup>30)</sup>

Given the progressive problematist constraints on a progressive mentalism, external data are relevant to the evaluation of rival theories such as The Definitional Theory and The Meaning Postulate Theory. FFG do in fact use external data in their evaluation of the relative merit of the two theories. Thus they (1975:518) declare: "In what follows we shall argue for abandoning the definitional approach entirely since, so far as

we can tell, it is inherently unable to account for a variety of pertinent facts about the way in which people understand sentences". From this remark by FFG it is clear that the external evidence which they will consider comprises data about sentence comprehension.

FFG are not very explicit about the details of the bridge theory which must specify the relationship between the language faculty and the comprehension of sentences. They do, however, refer to one of the principles of their bridge theory. This principle can be formulated as follows:

- (8) Understanding a sentence requires the recovery of its semantic representation.<sup>31)</sup>

FFG (1975:516) elaborate as follows on the principle (7):

- (9) "...the view that semantic representations are implicated in the sentence comprehension process is independently plausible since it provides for an extremely natural account of communication exchanges between speakers and hearers. On this account, the formal objects that are encoded and recovered in speech exchanges are semantic representations. It seems that any psychological model of such exchanges must recognize some formal object which captures the notion of the message standardly communicated by uttering a sentence. The view we are considering here --- which, in fact, we endorse --- requires that this object be among the structural descriptions that the grammar assigns to the sentence."

Let us now consider one of the problems in connection with sentence comprehension which FFG discuss. This is the problem or "puzzle" of the high speed of sentence comprehension. As they (1975:526) put it, "the overwhelmingly puzzling problem about sentence comprehension is how people manage to do it so fast".<sup>32)</sup> FFG then proceed to argue that The Meaning Postulate Theory, but not The Definitional Theory, can provide a solution to this problem of the speed of sentence comprehension. In order to understand FFG's arguments concerning the solution of the speed problem by the rival theories, we must first consider the way in which they (1975:526) relate the distinction between "understanding a sentence" and "drawing inferences from a sentence" to a distinction between two types of psychological processes.

- (10) "...notice that the distinction between processes that are involved in understanding a sentence and processes that are involved in drawing inferences from it corresponds to a distinction between mandatory, on-line psychological processes and optional, long-term psychological processes. For, by hypothesis, the output of the sentence comprehension system is that representation of the sentence which must be recovered by anyone who understands it. But the application of principles of inference is presumably largely context-determined. What inferences we draw from what we hear must be a question of what we take to be relevant to the task at hand. (Clearly, we cannot draw all the inferences since there are typically infinitely many.)"

According to FFG (1975:526), their remarks quoted in (9) have a bearing on the potential ability of the two rival theories --- The Definitional Theory and The Meaning Postulate Theory --- to provide a solution to the speed problem.

- (11) "Given this consideration (--- i.e., the high speed of sentence comprehension --- M.S.), it seems clear that, barring decisive evidence to the contrary, we should assume that the semantic representation of a sentence is as much like the surface form of the sentence as we can. For, in doing so, we reduce the load on processes that must be assumed to be performed on-line. In particular, then, given a choice between assigning a process to the comprehension system and assigning it to the inferential system, all other things being equal we should choose the latter option. That is precisely what hypothesizing meaning postulates in place of eliminative definitions permits us to do."

One can summarize FFG's position on the ability of the two rival theories to solve the problem of the speed of comprehension as follows:

- (i) The Meaning Postulate Theory (in principle) provides us with a solution to the problem of the high speed of sentence comprehension.<sup>33)</sup>
- (ii) The Definitional Theory does not provide us with a solution to the problem of the high speed of sentence comprehension.

For a progressive problematist working within the tradition of a progressive mentalism, the external problem concerning the high speed of sentence comprehension would feature as follows in the evaluation of the rival

~~semantic theories under discussion:~~ The Meaning Postulate Theory solves an external problem which The Definitional Theory does not solve. The fact that The Meaning Postulate Theory solves this problem increases its problem-solving effectiveness. The external problem constitutes an anomaly for The Definitional Theory.<sup>34)</sup> Thus, it decreases the problem-solving effectiveness of The Definitional Theory. Consequently, all other things being equal, The Meaning Postulate Theory must be accepted as a better theory than The Definitional Theory.

The stipulation "all other things being equal" conceals a host of complications which the progressive problematist will have to face in the course of an actual theory evaluation. A few such complications are illustrated by the following situations that may arise in the evaluation of the theories under discussion:

- (i) While The Meaning Postulate Theory may solve external problems about sentence comprehension, which The Definitional Theory does not solve, The Definitional Theory may have more success in the solution of internal problems than does The Meaning Postulate Theory.
- (ii) While The Meaning Postulate Theory and The Definitional Theory may have comparable success with respect to internal problems, and may both solve external problems, the two theories may solve different sets of external problems.
- (iii) While both The Meaning Postulate Theory and The Definitional Theory may solve internal as well as external problems, they may not solve the same set of internal problems, or the same set of external problems.

The first complication concerns the relative weight of internal problems vs. that of external problems. In particular, the question arises whether the solution of internal problems contributes more or less to the problem-solving effectiveness of a theory than does the solution of external problems. The second complication concerns the weighting of different external problems.<sup>35)</sup> The third complication concerns the relative weight of external problems vs. that of internal problems, the relative weight of different external problems, as well as the relative weight of different internal problems. A detailed discussion of such problems fall outside the scope of the present article. It should be clear, however, that such problems would have to be solved before a progressive proble-

matist can properly evaluate mentalistic theories.<sup>36)</sup>

## 5. Conclusion

The main conclusion of this study can be formulated as follows:

- (12) Adoption of a nonfalsificationist methodology does not necessarily allow the linguist who wishes to pursue a progressive mentalism to ignore external linguistic data when evaluating mentalistic theories.

This conclusion follows from a demonstration that at least one nonfalsificationist methodology, viz. Laudan's progressive problematism, forces the progressive mentalist to consider the problems raised by external data when evaluating mentalistic theories. The conclusion of this study, taken in conjunction with the conclusions of (Botha 1979b) about the role of external data in a falsificationist view of progressive mentalism, provides considerable support for the claim that mentalistic linguists will simply have to face the challenge which external linguistic data pose for their theories.

NOTES

1. For an explication of the notion 'external linguistic evidence' and of the distinction between external and internal linguistic evidence, cf. eg. Botha 1973:76-78; Botha 1979a:7-8; Botha 1979b: 33-34; Botha to appear: §9.3.2.2.3.
2. Cf. e.g. Botha 1973, especially Chapter 5; Botha 1979a; Botha 1979b; Bresnan 1978; Chomsky 1976; Chomsky and Katz 1974; Lightfoot 1979, especially §1.5; various articles in (Cohen (ed.) 1974), particularly those by Hutchinson, Whitaker, Clark and Haviland; various articles in (Cohen and Wirth (eds.) 1975), particularly those by Fromkin, Foss and Fay, Zwicky, Kiparsky, Wirth; Fodor, Fodor, and Garrett 1975; Katz 1977.
3. One other context in which external linguistic evidence figures prominently, is that of debates about the truth/falsity of markedness claims. In this connection (Lightfoot 1979) may be considered.
4. Unless otherwise qualified, the term "linguistic theory" will be used to refer to both specific grammars and universal grammars.
5. This view is argued for in (Katz 1977). Katz calls this view "Competencism".
6. This is the view presented in (Chomsky 1976).
7. This is the view argued for in (Botha 1979a) and (Botha 1979b).
8. For discussions in which support for this assumption is presented, cf. e.g. Botha 1971:176-7; Botha 1979b:8; Sinclair 1977:2-6. For discussions of problematic aspects of the view that the underlying methodology of generative grammar is falsificationist, cf. e.g. Botha 1978; Ringen 1975; Sinclair 1977. Ringen deals with the possible nonempirical nature of the data available for the testing of linguistic theories, while Botha and Sinclair discuss

the existence of protective devices which harm the refutability of linguistic theories.

9. Note that Botha's arguments assume the existence of an acceptable form of nonmentalism. Cf. Botha 1979b:58f in this connection.
10. The first two options are also considered by Botha (1979b:578), in his discussion of the various ways of responding to the conclusion that Chomskyan mentalism, in the form presented in (Chomsky 1976), is nonempirical.
11. Cf. Katz 1977:562f for a discussion of one possible nonmentalistic position, viz. so-called "Platonism". This discussion clearly shows why external evidence can be ignored in the evaluation of nonmentalistic theories. Cf. also Botha 1979b:59, 93 for further remarks on the irrelevance of external evidence to Platonist linguistic theories.
12. Cf. Laudan 1977:14f for a discussion of the nature of empirical problems, and Laudan 1977:48f for a discussion of the nature of conceptual problems.
13. Cf. Laudan 1977: 31f for a discussion of the weighting of empirical problems, and Laudan 1977:64f for a discussion of the weighting of conceptual problems.
14. Cf. Laudan 1977:68-9 for further remarks on the consequences which his view of conceptual problems has for the notion of progress.
15. Laudan's research traditions differ in certain respects from Kuhn's paradigms and Lakatos's research programs. Cf. Laudan 1977, Chapter 3 for a detailed discussion of the nature of research traditions.
16. Laudan allows for the possibility that different RTs can combine in various ways to form new RTs. Cf. Laudan 1977:103f for an explication of this point. Chomskyan transformational generative grammar must probably be seen as an RT. It seems likely that positions such as Platonism, Competencism, and Performancism (cf. Katz

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1977 for an exposition of these positions) should also be seen as RTs which can combine with Chomskyan generative grammar to form different, but related RTs. However, I do not intend to consider the complex question of identifying RTs in any detail here.

17. Laudan is not quite convinced that he has solved the problem of rational pursuit. Thus he (1977:113-4) remarks: "Whether the approach taken here to the problem of "rational pursuit" will eventually prevail is doubtful, for we have only begun to explore some of the complex problems in this area; what I would claim is that the linkage between progress and pursuit outlined above offers us a healthy middle ground between (on the one side) the insistence of Kuhn and the inductivists that the pursuit of alternatives to the dominant tradition is never rational (except in times of crisis) and the anarchistic claim of Feyerabend and Lakatos that the pursuit of any research tradition --- no matter how regressive it is --- can always be rational".
18. Cf. references in note (1) above for explications of the distinction between internal and external evidence. Note that there is actually more than one type of internal evidence: (i) intuitive evidence (which is the type characterized here), (ii) hypothetical evidence; (iii) theoretic-intuitive evidence. Cf. the references in note (1) to (Botha 1973) and (Botha to appear) for explications of the last two types of internal evidence. In this paper the term "internal evidence" will be used to refer to intuitive evidence only.
19. These idealizations include: (i) the idealization that the nature of linguistic competence can be studied by abstracting away from the effect of the various other cognitive systems that interact with linguistic competence in the actual use of language; (ii) the idealization of the ideal speaker-listener in a homogeneous speech community; (iii) the idealization that language acquisition by the child can be viewed as an instantaneous process. For a discussion of the first two idealizations, and for references to works by Chomsky in which these idealizations are explicated, cf. e.g. Botha 1979b:36-37. For the third idealization, cf. Chomsky 1975:14, 119f.

20. Cf. Botha 1979b, Chapter 5, n. 1 for an explication of what it would mean for a form of mentalism to be a metaphysical system or a terminological game.
21. All the page references in this section are to (Katz 1977).
22. Cf. Botha 1979b:93 for a similar, but more detailed, explication of the irrelevance of external data to Competencism.
23. Note, as Botha (1979b:92) also points out, that Competencism cannot be subjected to a "final" analysis at this stage. Some of its principles are not quite clear, and Katz has promised a fuller account of it in a forthcoming study "What a grammar is a theory of".
24. Cf. Bever 1974:178 for a formulation of the rationalist thesis.
25. Cf. Botha 1979b:38-9; §4.7; §5.4.4.1 for a detailed exposition of this paradox.
26. Cf. Botha to appear, §9.3.2.4.3 and Botha 1979b: §5.4.4.2 for an explication of the nature and function of bridge theories, and for references to works in which specific bridge theories are proposed.
27. Cf. Botha 1979b, §§5.4.4.1 and 5.4.4.2 for the solution to The Mentalist-Rationalist Paradox within a falsificationist framework. Note that the solution presented here for progressive problematism is in essence the same as the solution Botha presents for falsificationism.
28. It is important to stress that I am not concerned here with the actual merit of the rival semantic theories. The discussion in §4 is not in any way intended as a defence of either of the two theories, and consequently it should not be interpreted as such. It follows that I am also not much concerned with the substantive merit of the arguments which Fodor, Fodor, and Garrett present against The Definitional Theory and in favor of The Meaning Postulate Theory, nor with the specific criticisms which Katz (1977) raises against their arguments. The aim of §4 is merely to illustrate the role which an external problem, such as the one about the speed of sentence

comprehension, would play in the evaluation of rival linguistic theories, when these theories are interpreted as mentalistic theories.

29. Cf. FFG 1975:515-6; 517 for a brief explication of The Definitional Theory.
30. Cf. FFG 1975:525 for a brief explication of The Meaning Postulate Theory.
31. Cf. FFG 1975:515-6 for a discussion of this principle.
32. To illustrate the high speed of sentence comprehension, FFG (1975: 526) refer to certain experimental results presented in (Marshall-Wilson 1973). Thus they say that "...there is evidence that subjects can perform tasks which depend on recognizing meaning relations in sentences with latencies as low as 250 msec ; that is, with latencies which approximate the length of a CV syllable or the lower bound on a two-choice reaction task".
33. Note, incidentally, that Katz (1977:579) disputes FFG's claim that The Meaning Postulate Theory can account for the speed of sentence comprehension.
34. Note that it is irrelevant whether The Definitional Theory is in conflict with the relevant data, or whether it simply has nothing to say about these data. This point was made on p. 99 above in the discussion of Laudan's notion 'anomaly'.
35. Botha (1979b:85.4.4.4) discusses a similar problem that arises for the falsificationist. Botha's solution takes the form of an evidential condition, The Relative Weight Condition, which specifies that the relative weight of a given type of external evidence is directly proportional to the relative adequacy of the bridge theory from which this type of evidence derives its relevance. Cf. Botha 1979b: 84-85 for a discussion of this condition. The relative adequacy of the various bridge theories would probably also influence the weight of various external problems. Cf. Laudan 1977:31-40; 64-66 for a

discussion of various factors that may influence the relative weight of problems. Note that the nature of these factors precludes the possibility of a permanent ordering of problems on the basis of their weight or importance; the relative weight of problems may change with time.

36. When considering such problems, one would have to come to grips with the issue of the adequacy of Laudan's problem-solving model for scientific progress. In this connection it is interesting to consider the criticisms raised by McMullin (1979) against Laudan's model of scientific progress. An important part of McMullin's criticism is in fact directed at the assumption that problems (empirical and conceptual) can be individuated so precisely as to enable one to count them, and at the assumption that relative weights can in fact be assigned to such problems. Cf. McMullin 1979:637f for a discussion of these (and other related) points. McMullin's criticism raises doubts about the workability of the problem-solving model, which Laudan 1977:127 proclaims to be its greatest virtue.

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