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EDITORS: JOHN HAWKINS AND HERBERT SCHRIEFERS

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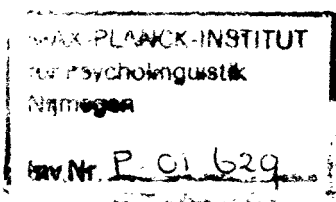
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PREFACE

The fifth year of the Max-Planck-Institute for Psycholinguistics brought the completion of its troika structure. Dr. William Marslen-Wilson was appointed as the Institute's third director. He will be in charge of the language comprehension research, and his appointment will involve a major expansion of the Institute's speech laboratory, both in terms of personnel and equipment.

The Institute also saw two of its senior staff members promoted to important positions elsewhere. The Medical Research Council awarded a Programme Grant to Dr. Lorraine Tyler for a project on normal and disordered speech comprehension. The project will be located at University College London and have close links to the comprehension and aphasia research of the Institute.

In addition, Dr. Suzanne Romaine was appointed Merton Professor of English at the University of Oxford. Dr. Romaine will also maintain contact with the Institute, within the framework of a joint project on Tok Pisin in New Guinea.

In this year's Annual Report special attention is given to the Institute's Language Universals Project, for which 1984 was a central year (the report has, as a consequence, become somewhat immoderate in size). We have not, however, cut down on the usual reporting of ongoing research in production, comprehension, acquisition and disorders of language. They are and remain the foci of our research programme.

Willem J. M. Levelt

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RESEARCH IN PROGRESS

1. LANGUAGE PRODUCTION

Research on the various processes involved in language production has centered in the past year on two main problem areas: reference and deixis, and lexical access in speech production. These studies will be reviewed in sections 1.1 and 1.2. In addition, substantial effort has been made in developing techniques to measure the magnitude of mental load during speech production, but as yet there are no reportable results.

1.1 Reference and Deixis

1.1.1 Tense and Temporal Deixis

Ehrich pursued her research on tense and temporal deixis. This research is mainly concerned with the following questions: (1) What are the basic analytic entities in the German tense system, that is how do relational, aspectual and modal meaning components interact in this system? (2) How are deictic and anaphoric tense meanings related to each other? (3) How are we to derive shifted tense meanings from basic ones? (4) How do tenses and temporal adverbs interact in establishing temporal reference in sentences as well as in discourse? (5) What are the empirical determinants governing speakers' use of homonymous tense forms and of temporal shifts in actual discourse?

Ehrich has designed a theoretical framework that is an extension of Reichenbach's (1947) schema for the analysis of the English tenses. The essential point in this framework is the distinction between the intrinsic meaning of a given tense and its deictic meaning. The intrinsic meaning is given by the relation between Event Time (E) and Reference Time (R), the

deictic meaning is given by the relation between Reference Time
(R) and Speaking Time (S). The relation between E and R is
fixed and cannot be changed; the relation between R and S is
variable and thus subject to shifts. In other words, the
deictic meaning of a given tense can be shifted, the intrinsic
meaning is invariable. To give an example:

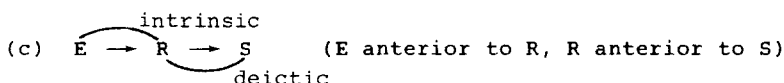### Basic Tense Meaning Present Perfect

              intrinsic
(a)   E $\longrightarrow$ S, R   (E anterior to R, R and S coinciding)
             deictic
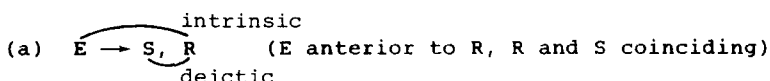
       Hans hat das Problem gelöst
       ('Hans has solved the problem')

Shifted Tense Meanings Present Perfect

              intrinsic
(b)   S $\longrightarrow$ E $\longrightarrow$ R   (E anterior to R, S anterior to R)
             deictic
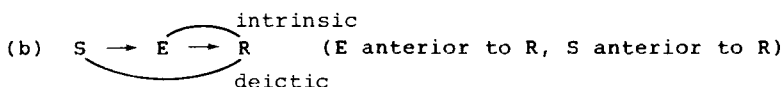
       Hans hat das Problem morgen gelöst
       ('Hans has solved the problem tomorrow')

           intrinsic
(c)   E $\longrightarrow$ R $\longrightarrow$ S   (E anterior to R, R anterior to S)
            deictic

       Hans hat das Problem gelöst gehabt
       ('Hans has had solved the problem')

(a) specifies the basic temporal meaning of a Present Perfect
with 'past' temporal reference, (b) and (c) specify derived
readings with 'future' and 'anterior to past' temporal
reference.

Anaphoric tense relations like **Am Donnerstag** **stand** **Hans** **früh**
auf. **Heute** **würde** **er** **heiraten** ('On Thursday, John got up early.
Today he would get married'), where both events referred to by
the two sentences are prior to the speaking time, but where the
second is posterior from the point of view of the first, are
treated in basically the same way, except that a second
reference point R' is introduced which serves an analoguous
function to that of S in the basic tense analysis.

1.1.2 Language and Space

     The position of a located object (L) relative to a
referent object (R) can be described deictically (i.e. from
the speaker's perspective) or intrinsically (i.e. relative to
the intrinsic orientation of R itself). In his theoretical
analysis of the perceptual determinants of the intrinsic and
deictic use of "left", "right", "in front of", "behind",
"above", and "below", Levelt (1984; see also Annual Report
1983) suggests that whereas deictic use of these terms is
possible with any orientation of R, intrinsic use might be
governed by 'the principle of canonical orientation'. The
intrinsic system can only be applied, if the referent object's
dimension, which is invoked by a preposition, is in a canonical
position with respect to the perceptual frame of orientation of
the located object. For example, a ball can be termed
intrinsically "in front of" a chair, if the chair stands
upright as normal or lies on the ground with its intrinsic
front-back axis aligned with the front-back or left-right axis
of the observer's frame of reference for the ball. This is not
the case, if the chair has tumbled over backwards so that its
front-back axis is aligned with the vertical axis of the
observer's referent frame.
     Meyer carried out three experiments to test the principle
of canonical orientation. In the first experiment subjects
rated how well intrinsic descriptions applied to 'canonical'

displays (i.e., displays where the dimension of R which was invoked by the preposition was canonically oriented) and to 'non-canonical' displays. It turned out that intrinsic descriptions were in general not rated more applicable to 'canonical displays' than to 'non-canonical displays'. They were, however, rated significantly more applicable to those canonical displays where R was canonically oriented with respect to all three dimensions (i.e. standing in its normal upright position) than to the remaining displays. This suggests a more rigorous formulation of the principle of canonical orientation: The intrinsic system can only be used, if all three dimensions of the referent object are in a canonical position with respect to the perceptual frame of orientation of the located object.

In the second and third experiments one subject had to describe various displays to a second subject, who could not see the arrays and had to reconstruct them according to the descriptions. Depending on the instruction most subjects adopted either the intrinsic or the deictic system throughout almost all trials - regardless of the orientation of R. The perceptual constraints on choice of reference system, which were identified in the first experiment, can therefore easily be overridden by the demands of the communicative task at hand.

1.1.3 Personal Reference in Connected Discourse

Redeker investigated how speakers refer to story characters in different speaking situations and discourse contexts. American students described short films to either a friend or a stranger in interactive and noninteractive speaking situations. References to the main characters were classified according to their discourse status as introductions, repeated references, or reintroductions.

The syntactic structure of the initial character descriptions varied with the amount of listener participation.

In highly interactive situations, the introduction of a character was often a string of component descriptions instead of one integrated noun phrase. It appears that the speaker who is faced with competition for the floor cannot afford to delay his reference until all selection and linearization processes are completed.

After the introduction, and if the focus has not shifted away from the characters, they can be referred to pronominally. However, even in cases where pronominal reference would be perfectly unambiguous, speakers do not always choose this option. "Redundant" nominal references can be shown to have clear discourse functions relating to the local and global topic status of their referents. Their more frequent use in noninteractive situations suggests that differential topic marking is more important when the listener cannot give feedback.

Reintroductions (after a character has been "off stage") showed a surprising qualitative difference: Speakers who described the films to a stranger tended to change their description of the characters according to locally relevant features (e.g. "the lady" - "the other daughter" - "the older sister"), while speakers whose addressee was a friend developed a more stable perspective on the characters and even negotiated name-like "recognitional" reference forms (e.g. "I'll call'm a boy-scout", "the fat guy, okay?").

Further analyses will focus on the local and global topic status of main and side characters and on differences between "narrative" and "descriptive" mentions.

1.2 Lexical Access in Production

1.2.1 A Dual Access Theory

During 1984 Levelt and Pechmann made a concerted effort to develop experimental procedures for testing and elaborating what can be called the dual access theory. The theory was originally proposed by Garrett and found some support in speech error data, as well as in experimental findings of Levelt and Maassen, and Kempen and Huybers. According to the theory, lexical access in production proceeds in two phases. In the first phase, a so-called lemma is accessed whose meaning fulfills certain conceptual conditions of the message. In this phase, more than a single lemma candidate may be activated, followed by a narrowing down process. A lemma contains semantic and syntactic information, but only a pointer to word-form information. In the second phase, the selected lemma will address its word form. In this phase more than one word form may become activated, followed by some narrowing down. In the experimental procedures an acoustic lexical decision probe is given to the speakers at various moments before a word is actually uttered. These test probes are either semantically or phonetically related to the target word, and the lexical decision reaction times should reveal facilitation or interference dependent on the phase of the accessing process. All preliminary experiments for selecting the visual stimuli and linguistic materials were completed during 1984, and the main experiments are now being run.

1.2.2 Morphology in Speech Production

In two series of experiments Eling studied the issue of whether morphologically complex word forms have to be composed and therefore require more planning time than morphologically simple words. In the first set of studies subjects were

presented with pictures of concrete objects and familiar types of animals. Either one or two identical objects (e.g. one or two frogs) were presented eliciting singular or plural forms ("kikker" or "kikkers", in Dutch). The objects could also be particularly small, eliciting the diminutive form ("kikkertje"). When word length was controlled for, no effect of morphological complexity was found. Speech onset latencies were no different for simple and complex word forms. A strong congruency effect was found, however; when a small object was labelled with a non-diminutive form or a set of two objects was named with a singular form, the naming latency was relatively long.

These results were confirmed in a second experiment where comparative morphology was induced ("longer" - "longest"). Again, there were no effects of morphological complexity on speech onset latencies, but more natural descriptions had shorter latencies than less natural ones. In summary, there is no evidence for morphological composition in speech onset latencies. These reaction times, rather, depend on the appropriateness of the word, given the concept to be expressed.

1.2.3   Semantic Markedness in Speech Production

Children normally acquire the semantically unmarked member of a pair of antonymous (dimensional) adjectives (e.g., big) before the corresponding marked member (e.g., small). The same asymmetry holds for ease of comprehension in adults.

In a series of experiments Schriefers showed this asymmetry to also play a role in language production. Subjects were presented pictures with two geometric figures that were, for example, either identical or different in overall size. Subjects had to name the relation between the figure marked by a star and the other figure by means of the vocal responses "bigger", "smaller" or "same". There were two presentation conditions: either the star was presented 1.5 sec before the

appearance of the figures (so-called PRE-condition), or the star was added to the picture 1.5 sec after the onset of the figures (so-called POST-condition). In both presentation conditions responses using the unmarked comparative were given faster than responses using the marked comparative. Furthermore, RTs in the POST-condition were clearly shorter than in the PRE-condition, showing that subjects are able to profit from perceptual preprocessing of the figures before appearance of the star. Together with the findings of three control experiments, the results suggest that the observed markedness effect is due to the lexicalization process.

The pattern of errors in the relation naming experiments indicated that subjects sometimes tend to name the absolute size of the figure marked by the star instead of the relation between the two figures (e.g., "big-uh-same" as a response to a picture of two quite big figures of the same size). Almost all of the errors with two figures of equal size fit the notion of confusing absolute and relative information.

A direct test of this notion was provided by relation naming experiments in which subjects were either presented with two quite small figures of different size or with two quite big figures of different size. Again, PRE- and POST-conditions were used. In the PRE-condition, a congruity interaction showed up, with "smaller"-responses being faster than "bigger"-responses for two quite small figures, and the reverse pattern for two quite big figures. Additionally, there was a main effect of markedness. In the POST-condition, the congruity effect was clearly reduced (or even completely eliminated), while the markedness effect was still obtained.

Taken together, these experiments give rise to the following theoretical considerations: (1) The lexicalization process is preceded by a "conceptual selection stage". In this stage, the conceptual information to be mapped onto lexical items has to be selected. If the conceptual representation of the to-be-described event contains conflicting information

(e.g., conflicting information on absolute and relative size),
then this selection process will be prolonged. (2) The mapping
of the selected conceptual information onto the corresponding
lexical items shows the same type of markedness effect as found
in language comprehension. (3) Markedness effects appear to be
due to properties of the lexical semantics of adjectives. The
polarity of dimensional adjectives as introduced in Bierwisch's
theory of gradation (cf. Bierwisch et al. 1984) can be viewed
as such a property.

1.3 Other Research

    With reference to the rhythmically disparate French and
English languages, Wenk's work on linguistic input to musical
composition has revealed a significant mother tongue effect in
terms of temporal patterning on both the vocal and instrumental
writing of representative French and English composers.

2. LANGUAGE COMPREHENSION

A major focus of the comprehension group has been an investigation of the mental processes and representations that underlie the ability to recognize words. Specific issues that have been experimentally tested this year include: the contribution of lexical representations to phonetic processing; lexical frequency effects; context effects; the cohort model; the role of inflectional and derivational affixes in word recognition; and the structure of the mental lexicon.

A second area of research has involved the comprehension of particular grammatical morphemes and structures, specifically the recognition and accessing of gender morphology, the influence of linguistic and perceptual factors on the comprehension of deictic spatial prepositions, the parsing of clause-final verb clusters, and the comprehension of adverb scope.

Several experiments on text comprehension (including the study of inferencing processes in anaphora resolution) constituted a third area of concentration.

A fourth major theme, which also has links to both production and acquisition research, has been language universals, as determined by the typological study of numerous grammatical properties in the languages of the world. Work has centered on identifying universals, determining their causes (one important class of possibilities being processing factors involving either the speaker or the hearer), and the relationship between language universals and language acquisition.

A fifth area of concentration has been the linguistic study of semantics and pragmatics. There is a very direct relationship between linguistic accounts of semantics and pragmatics and the comprehension and production processes

studied by psycholinguists since the major task of encoding and decoding language in real time involves precisely assigning meanings to linguistic forms. The research focussed on determiner systems, definite and indefinite descriptions, and tense.

2.1 Word Recognition

Frauenfelder pursued his investigations of the mental processes and representations that underlie our ability to recognize words. The research focussed on the properties of the phonological representations assumed to mediate lexical access. These representations include: (1) sub-lexical access codes (i.e. phonemic or syllabic) computed from the sensory input, (2) the phonological representation of activated but not accessed candidate words, and finally (3) the full phonological lexical representation of the accessed word.

The collaboration with Marcus (IPO) saw the completion of studies on the possible top-down effect of the phonological representations of activated candidate words (2) upon the computation of a phonetic access code (1). The perceptual cost of phonetic distortions on speeded phonetic and lexical decisions was measured as a function of varying left to right lexical constraints, that is, a varying number of activated lexical candidates. A set of stimuli was generated in which the initial consonant varied along a continuum from the correct phonetic realization (say /p/ in "parakeet") to one inappropriate in place of articulation (say /t/ in *"tarakeet"). Words were chosen such that lexical information indicated early or late in the time-course of the stimulus which phonetic realization was inappropriate and formed a non-word. A strong lexical effect on phonetic processing, reflected by a shift in the phonetic categorization towards a word consonant, was found. However, the absence of a

difference between the early/late conditions indicates that the locus of this lexical effect is subsequent to, and not during the process of, word recognition. Thus, the phonological representation of accessed words and not that of activated candidate words affects the phonetic decision response.

Another set of experiments provided further evidence for the contribution of this lexical representation to phonetic processing. In a phoneme monitoring task, subjects were asked to detect both word initial and word non-initial phoneme targets in mono- and bi-syllabic words of high and low frequency. The non-initial phoneme targets in high frequency words were detected faster than those in low frequency words; there was no such frequency effect for phoneme targets in word initial position. Thus, subjects responded on the basis of two different codes, the sub-lexical access code and/or the lexical code, depending upon the position of the target in the word. These results reflect the rise-time of the lexical representation which becomes available to affect phoneme detection times for targets located in word non-intiial position. However, this phonological representation is not yet accessed before the detection of word initial phoneme targets is completed.

The lexical frequency effect itself remained an important focus of Frauenfelder's research. Despite the solidity of the experimental evidence for the lexical frequency effect, considerable uncertainty persists on how to best explain this effect. Indeed, the frequency effect has been interpreted in terms of quite different components of the lexical processing system such as the processes of lexical access and retrieval, the structure of the lexicon and more recently post-access decision processes. The approach taken by Frauenfelder involved comparing the results from various auditory paradigms including phoneme monitoring, gating and lexical decision. Factors known to affect auditory word recognition such as the sequential phonemic structure and uniqueness point were tightly

controlled. Thus, matched pairs of high and low frequency words of diverse syllabic lengths were selected such that they differed only in the onset consonants of their first syllable (for example "tijd"/"nijd" and "moeder"/"poeder"). Strong frequency effects were obtained with all three experimental tasks for both mono- and bi-syllabic words. This convergence between the results from quite different experimental procedures establishes the robustness of the frequency effect for the auditory modality. Finally, the controversial difference in frequency sensitivity of open and closed class words (frequency effect for open class words only) was tested in a follow-up study in French (with Segui and Mehler, Paris). In a visual lexical decision task, a strong frequency effect was obtained for both open and closed class words even in presentatation and response conditions thought to maximize the dissociation between the two word classes.

Tyler investigated the effects of various types of context on the processes involved in recognising spoken words. First, she undertook an extensive analysis of the words subject produced in a large-scale gating experiment (reported in Annual Report 1983). These responses were analysed for word frequency, length and compatibility with both contextual constraints and the sensory input. These responses, pooled across subjects, enabled a number of claims to be evaluated concerning the use of top-down and bottom-up information in the process of word recognition. The analyses show that, in the process of recognising a spoken word, subjects initially produce a large number of responses compatible with the sensory input. This set diminishes in size as more of the word is presented. The rate at which responses drop out of the initial set differs depending on whether words are heard in isolation or in context. These properties of the elicited responses are compatible with claims made by the cohort model for the integration of top-down and bottom-up information in the

process of recognising a spoken word.

Tyler also ran an experiment to investigate the suitability of the gating task for studying the on-line process of spoken word recognition. She compared two different versions of the task. In one, subjects were placed under no time constraints to produce a response, and in another, they were encouraged to respond as rapidly as possible. Target words occurred either in isolation or in various types of syntactic and semantic contexts. These different contexts had the same effect on word recognition whether subjects responded within 500 msec of fragment offset or without time constraints. This suggests that both versions of the task are as sensitive as other on-line tasks to the real-time processes involved in spoken word recognition.

Zwitserlood completed her dissertation research with a series of on-line experiments. The materials and the task were the same as in her earlier research (see Annual Report 1983). A combined analysis of the data of all lexical decision experiments revealed a detailed picture of the time course of the activation of different word candidates during spoken word recognition, and the locus of the effects of word frequency and contextual constraints.

The data support two important claims made by the Cohort model: (1) autonomous lexical access resulting in the instantiation of a word initial cohort, and (2) selection of one word candidate under the guidance of contextual information. Evidence for the autonomy of processing at early stages of word recognition is derived from two sources: data on the preselection and on the simultaneous activation of word candidates. The data show no evidence for preselection of a subset of plausible word candidates on the basis of contextual information. In particular, both contextually appropriate and inappropriate word candidates are activated in the process of lexical access. Contextual constraints affect the process of

selecting one word candidate, allowing for word recognition to take place as early as possible. The data of the more recent experiments confirm the effects of word frequency found in the earlier experiments. The results of these experiments are currently being written up and will constitute the doctoral thesis.

In some lexical decision experiments Eling studied the recognition of word forms with inflectional and derivational suffixes. Only with inflectional suffixes was an effect of morphological structure on word recognition obtained. To complete this series of experiments he performed a study in collaboration with Bergman (Interfakultaire Werkgroep Taal- en Spraakgedrag) on the recognition of derivational prefixes and on the possible 'strategy effects' that have been reported for this type of lexical decision task. The study replicated the results obtained by Taft: real prefixed words were recognized faster than psuedoprefixed words. However, as in the Taft study there were also many errors made with pseudoprefixed words. When these errors were analysed it was found that they involved a small subset of pseudoprefixed words. Analysing the results again with omission of these items showed no difference between morphologically complex and simple words. These results are in line with the conclusion of former studies: derivational word forms are not decomposed to access the mental lexicon.

Tyler started an experiment on the interaction of morphological structure and syntactic constraints. The specific issue being addressed concerned the extent to which syntactic constraints facilitate identification of suffixes. The data from this experiment will be available in 1985.

Flores d'Arcais continued a project together with Rob Schreuder (Leiden, Nijmegen) on the structure of the mental lexicon. Their previous work had allowed them to isolate,

within the semantic representation underlying a word, two components: a preceptually-based and a conceptual one. Work carried out during 1984 tried to test a hypothesised differential rate of activation for the two components, and the results definitely showed that the two components are likely to be activated with different rates. Perceptually-based semantic information, probably acquired earlier in the process of the acquisition of word's meaning, seems to be available earlier or with a faster maximum activation effectiveness than information based on abstract or functional properties of the objects to which the words refer. More work was continued in this area, investigating different aspects of the activation of the semantic information upon word recognition. Flores d'Arcais also continued, with very much the same results reported in the Annual Report 1983, his work on the notion that differences in the ease of lexical access between different types of words might be as much a question of meaningfulness as of grammatical class.

2.2   The Comprehension of Particular Grammatical Morphemes   and Structures

Deutsch, in cooperation with Frank Wijnen, continued his research on the processes that operate in the recognition and accessing of linguistic gender. They studied whether a function word - the Dutch article de or het - can facilitate the processing of a following content word, namely monosyllabic Dutch nouns. They were able to interpret the main results of their experimental studies within a unified theoretical framework. Since the article and noun together constitute the noun phrase (NP) as a structural unit, the effect of an article may be to prime the category "noun". The theoretical foundations of this notion can be found for example in Kaplan's ATN model of language processing.

From the perspective of this model it is possible to make
the prediction that the process of recognizing whether the
appropriate article is present in a given NP ought to occur
faster than the process of assigning an appropriate article to
a given noun. When the article occurs first, the recognition
of the following word should be facilitated through the
top-down expectation of a certain word category to follow. The
article has a facilitating effect on the recognition of that
part of the mental lexicon involving nouns, with which articles
combine to form NPs. This facilitating effect can only occur
when the article precedes the noun, which is the grammatically
correct ordering in Dutch. The experimental results confirm
this view.

Can the article facilitate the processing of the following
word with regard not only to its grammatical category but to
its gender as well? In other words, it may be, for example,
that the article "het" primes the subclass of words in the
mental lexicon associated with this form of gender marking.
Conversely, "het" may inhibit the accessing of those nouns
associated with the article "de", and vice versa. These
predictions were not supported by the results. The
presentation of an article primes the NP schema, but not the
syntactic gender of the noun within the NP schema. It is
hypothesized that the representation of a noun in the mental
lexicon of a native speaker of Dutch does not include the
gender marking morpheme itself, but rather an abstract gender
feature ($\pm$ de). This takes into account both the preference of
the definite article over other potential gender markers, as
well as the disproportionate frequency of "de" and "het". The
more rapid recognition and accessing of the article "de" in
relation to the article "het" is due to the more rapid priming
of the de-form upon complete recognition of the noun.

It would seem especially important to carry out further
experiments in languages in which the relationship between
gender-marked nouns and gender marking morphemes is less

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arbitrary than in Dutch. In this manner one could assess the
extent to which the structure of the mental lexicon and the
processes that are involved in its operation are determined by
language-specific characteristics.

Weissenborn and Friederici (in collaboration with Schwarze
and Cohen, University of Konstanz) investigated the influence
of linguistic and perceptual factors on the comprehension of
deictic spatial prepositions in German ('hinter, vor, neben').
Subjects were presented with descriptions of the following
kind,
1. Wenn man vom Bahnhof kommt, kommt man erst an eine Kirche.
2. Hinter der Kirche ist/kommt eine Laterne.
3. Daneben/neben ihr/neben der Laterne ist ein Parkplatz.
mentioning four objects. The first two of these are part of a
miniature landscape placed in front of the subject. The last
two objects had to be added by the subject according to his/her
interpretation of the description. The following linguistic
factors were varied:
(a) the nature of the verb in the second sentence
    (static/dynamic)
(b) the localizing expression in the third sentence (pronominal
    adverb, preposition + pronoun, preposition + noun phrase)
The perceptual factors that varied were:
(c) the nature of the second reference object (oriented/non-
    oriented)
(d) the position of this object with respect to the first
    object and to a street (same orientation as the first
    object, opposite orientation, orientation towards the
    street). (d) holds only for oriented objects.
(e) the orientation of the subject with respect to the spatial
    display (the subject is sitting behind the first reference
    object, or is facing the first reference object).

Initial results indicate that the critical parameter for the interpretation of the preposition is the nature of the verb that imposes a certain perspective on the listener. The properties of the reference object (oriented/non-oriented) play only a secondary role. These findings are at variance with the hypothesis that the intrinsic interpretation of the prepositions in question is basic. In accordance with these results the position of the subject had no effect. The same study will be carried out with normal and vestibular disordered children.

Research initiated by Bach (University of Massachusetts), Marslen-Wilson, and Brown, has begun to look at the psycholinguistic consequences of the different ordering of clause-final verb clusters in German and Dutch. Consider the following pair:
1. Janine heeft de mannen Hans de paarden helpen leren voeren.
2. Johanna hat den Männern Hans die Pferde füttern lehren helfen.

Both these sentences can be glossed in English as meaning "Joanna helped the men teach Hans to feed the horses". The salient difference between the two is in the ordering of the final verbs, which is exactly reversed for the two languages. The theoretical significance of this lies in the difficulties each ordering creates for different parsing mechanisms. A simple push-down stack will have no difficulty with the German case, where the final verbs arrive in the correct order to allow the preceding NPs to exit from the stack as they are needed. Such a mechanism, however, cannot parse the Dutch sentences, which exhibit cross-serial dependencies. The verb "helpen" in (1), for example, cannot be linked to its NPs ("Janine" and "mannen"), because they are buried underneath "Hans" and "paarden" in the stack. Alternative procedures -- for example the sort of process compatible with the categorial grammars described by Steedman, Ades, Bach, and others -- would

have less difficulty with the Dutch case than with the German case.

Despite the interest in this contrast in the current literature, it has remained quite unclear whether these two orders were more or less preferred by the speakers of each language. Therefore a series of test-sentences was constructed, which gradually increased in complexity from level 1 sentences -- "Hans heeft de paarden gevoerd" -- to level 4 sentences -- "Piet heeft de zigeuners Ilse een hond een bot zien helpen leren opgraven". Matched sets were created for Dutch and for German, and each were accompanied by paraphrase sentences, presenting the same propositional content in a less syntactically demanding manner (e.g., "Piet heeft gezien dat de zigeuners Ilse hielpen om een hond te leren een bot op te graven"). The separate Dutch and German stimulus materials were presented to native speakers of each language in a combined judgement and question task. The subjects were asked both to judge the comprehensibility of the sentence, and to answer questions about the grammatical relations between the NPs and VPs in the sentences.

The results, both for comprehensibility ratings, and for error rates in the question task, show that as the sentences go from level 2 (two final verbs) to level 3 (three final verbs), there is a sharp decrease in performance. This decrease, however, is significantly more marked for the German subjects than for the Dutch subjects. Contrary to the predictions of a push-down stack based approach, speakers of a language employing cross-serial dependencies have less difficulty with extended clause-final verb clusters than do the speakers of German, where dependencies between items do not cross.

Flores d'Arcais continued work which began at the MPI three years ago on the scope of adverbs (in conjunction with de Waal, Leiden). A series of further experiments were conducted on memory and on judgements of appropriateness involving

paraphrases of sentences containing modal adverbs. The results
showed that the scope of the adverb in a sentence clearly
extends to the left of its position, but that several
syntactic, semantic and pragmatic factors affect the "action"
of the adverb within the sentence.

2.3 Text Comprehension

Vonk continued her research on the expression and function
of contrast relations in written discourse in collaboration
with Spooren and Jaspers (IWTS, University of Nijmegen), and
Noordman (University of Tilburg). It was investigated whether
textual relations marked by "but" are asymmetrical, as they are
supposed to be on the sentence level. On the basis of a corpus
of newspaper texts containing textual contrasts, texts were
constructed in which one of the contrastive parts was an
argument in favour of a possible conclusion on an issue, and
the other part was an argument against that conclusion. The
opinions of the writers were omitted from the texts. The order
of the arguments appeared to be a decisive factor for the
reader's interpretation of the writer's opinion. With respect
to the linguistic marking of the contrast the results are more
complicated. A preliminary result is that the effect of the
linguistic marking of the contrast with "but" depends on the
presence of other contrasting linguistic devices that identify
the parts in the contrast.

Other research on text comprehension by Vonk dealt with
the selective processing of text. An earlier series of
experiments on the impact of the goal in reading showed that
the particular issue on which the reader had to make a decision
influenced which information was recalled, and that the reading
times for sentences containing this information were longer.
Because a retrieval mechanism controlled by the decision task
is likely to be operative in recall, these experiments only

showed that the goal of the reader affects both the encoding and the recall of the text. To investigate whether better reproduction can be due at least partly to better encoding, reproduction was measured in a recognition task. Sentences that contained information relevant to the topic that had to be decided on were better recognized by readers who had to make the decision on that topic than by readers who had to make the decision on another topic. Consequently, it is plausible that the perspective effect is at least partly due to the selectivity in encoding the text. Experiments are in progress to investigate under what conditions better reproduction is related to longer reading times.

Vonk also investigated inferencing processes in anaphora resolution. Subjects had to read sentences such as "Harry lost the match to Albert because he played carelessly (skillfully)".
Eye movement registration showed that in a naming task the duration of fixation on the pronoun was significantly <u>longer</u> when a gender cue was available, but also that in a verification task the gender cue did not influence the fixation duration on the pronoun. The difference in results between the two experiments was explained in terms of the immediacy of processing being controlled by a strategy of selection of information dependent on different task demands. In order to investigate whether the antecedent of the pronoun is assigned immediately when reading the clause that contains the pronoun, clause reading times were measured of sentences in which the main clause was followed by two subordinate clauses, one containing a verb that could not disambiguate the pronoun as such (neutral clause), the other containing a disambiguating verb phrase that was either congruent or incongruent with the causality implicit in the main verb (disambiguating clause). The results provide evidence that the pronoun of the first subordinate clause was interpreted before the end of the sentence: The difference in reading time between the congruent

and the incongruent version of the disambiguating clause was greater when the disambiguating clause followed the neutral clause than when this clause preceded the neutral clause.

2.4 Language Universals Project

    1984 saw the first full year of the project on Explanation in Universal Grammar, organized by Hawkins and Holmback. The project was begun in 1983, and its goals are set out in the Annual Report for that year. Briefly, they involve an investigation of the kinds of factors that can explain the rapidly growing body of language universals that are being derived from extensive cross-language comparison (e.g. semantic, processing and functional explanations). The project is not philosophically opposed to an innateness account in Chomskyan terms. Quite the contrary. It holds that the force of any innateness account will actually be strengthened by a systematic investigation of more verifiable alternative causes which attempt to explain universal properties of linguistic form in terms, for example, of the semantic interpretations that are associated with them, or in terms of the comprehension and production processes that they entail, or in terms of the functions they are used to perform. These, in conjunction with innate grammatical knowledge, are the kinds of forces that shape linguistic structure, and the respective roles of each, and their mutual interaction in limiting the variation space available to human languages, cannot be determined without a clearer conception than we now have of non-innateness explanations for language universals. To this end, numerous specialists in the different approaches to this question are being invited to Holland, either as guests at MPI or as fellows at the Netherlands Institute for Advanced Study (NIAS), to pursue ongoing research, to collaborate with MPI researchers, and to contribute to the writing of edited books on explanation

in universal grammar. An additional and important part of the project involves language acquisition. What predictions do current language universals (again, primarily those derived from a wide range of languages) make for the acquisition process? What is the relative timing of properties and structures acquired, and what kinds of errors are made, and not made, in languages of different types? Acquisition data are being collected from numerous languages in order to address these questions (cf. section 3.1 below).

The primary participants in the project during 1984 were: (the regular scientific staff at MPI) Hawkins, Holmback, Bowerman, Frauenfelder and Levelt; (the guests at MPI) Andersen (USC), E.V. Clark (Stanford), Comrie (USC), Grosu (Tel Aviv), Keenan (UCLAS), Moss (UCLA), Slobin (UC Berkeley); (the fellows at NIAS) Bybee (SUNY Buffalo), Hoekstra (Leiden), Kooij (Leiden), König (Hannover), McKenzie (FU Amsterdam), Stassen (KU Nijmegen), Thompson (UCLA). Additional collaborators included: H.H. Clark (Stanford), Cutler (MRC Cambridge), and Gilligan (USC). There were numerous meetings, talks and workshops during the year, held both at MPI and at NIAS, with papers given primarily by project participants, and also by some outside speakers. These included: Hale (MIT), Plank (Konstanz), Seiler (Köln), and Du Bois (UCLA).

Holmback organized regular meetings of a research group which discussed the role of processing factors in explaining various types of cross-linguistic grammatical phenomena; i.e. assuming that one can delineate certain regularities across grammars, then to what degree can these be explained by a given processing theory? how does what we know about the processor motivate a given grammatical universal? The topics that have been considered in this light include the following: (a) the distribution of prefixing and suffixing across the world's languages, taking into account word-order type, (b) the tendency to displace to the end of a sentence 'heavy' or sentential NP's, (c) verb-particle movement and its relation to

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discourse processing, (d) cross-linguistic similarities and differences in processing the morphophonological level, focussing on syllable structure. There has also been work and discussion on the relationship between cognitive principles in general and (a) various lexical universals, (b) coordination possibilities of non-grammatically similar elements (across languages) and (c) the cross-linguistic ubiquity of the form and function of certain 'logical elements' (i.e., and, or, not, and various determiners). Andersen organized meetings of the research group on acquisition and universals, which included a highly suggestive talk by Keenan on the acquisition of relative clauses by young children in relation to the Keenan-Comrie Accessibility Hierarchy. A cross-language acquisition data bank is being set up at MPI, and a workshop of linguists and acquisition researchers is in preparation for 1985. Many of the project's meetings attracted large audiences from miles around. Some 50 participants attended the workshop at NIAS in May at which Keenan, Stassen and Comrie presented papers.

In addition to organizing the universals project Hawkins completed numerous research papers. One paper is a methodological one, which discusses the two major methodologies currently employed in research on universal grammar. The first, associated with generative grammar, involves examination of just a handful of languages (sometimes just one) and postulates general and abstract principles that underlie the grammaticality facts, etc., of the language(s) surveyed. The second, often referred to as typological universal grammar, involves comparison of a wide range of languages, in the search for descriptive and explanatory generalizations that predict the range of observed variation. The paper argues that the two methodologies are not in fact in conflict, but have complementary strengths and weaknesses. It is to appear in Language, under the title 'Complementary methods in universal grammar: a reply to Coopmans".

Hawkins also worked with Gilligan (USC) in preparing a paper on morpheme order universals, i.e. the ordering of (especially inflectional) morphemes within a word. The original insight upon which this research is based comes from Greenberg: across languages suffixal morphology (i.e. the postposing of an affix to the stem, as in the English plural form lion+s) is more frequent than prefixing (e.g. English a+kin), and both are considerably more frequent than infixing (whereby an affix is inserted into a lexical stem). The goal of Hawkins and Gilligan's paper is to discover the cross-linguistic regularities in this area in much more detail than Greenberg did himself, and to consider possible explanations for the suffixing preference. The languages consulted number over 200 and are drawn from three samples collected by participants in the universals project: a computerized typological sample of 125 languages collected by Stassen, with entries for many hundreds of properties including some morpheme orders; a computerized sample of morphological properties for some 40 languages employed by Bybee; and a sample of 39 languages collected by Gilligan. Hawkins and Gilligan formulate several implicational universals which link morpheme order in a word to a language's basic word order type, particularly verb and adposition order (i.e. prepositions or postpositions). For example, if a language has postpositions (NP+Po) or subject-object-verb (SOV) word order, gender affixes on a noun stem (if any) are suffixed; conversely if a language has prefixed gender affixes, it has prepositions (Pr+NP) and verb-object (VO) word order (i.e. neither NP+Po nor SOV). The net result of such implicational statements is a pattern like the following:

	Prefixes	Suffixes
VO / Pr+NP	X	X
OV / NP+Po	O	X

Languages with VO and/or Pr+NP word orders in their syntax (such as English) regularly have prefixes and/or suffixes in their morphology. But in a suggestively large number of cases, languages with OV and/or NP+Po have suffixes only. This distribution strongly implies the need for two major principles at the explanatory level: one which explains why prefixes occur productively only in VO and Pr+NP languages, while the opposite word orders (OV and NP+Po) are matched by the opposite morpheme order (suffixing); and another which favours suffixing overall and which is partially opposed to the independent predictions of the first principle for VO and Pr+NP languages. Hawkins and Gilligan argue that the first principle makes crucial reference to the notion 'head of phrase' in both syntax and morphology, and that heads are identically ordered relative to their modifiers at both levels (the Head Ordering Principle). The second principle, responsible for the suffixing preference, is argued to be a psycholinguistic one (and not a result of certain principles of historical change, as some linguists have suggested).

The psycholinguistic principle is set out in a paper written together with Cutler (MRC, Cambridge) entitled 'The suffixing preference: a processing explanation'. The explanation draws on two types of relevant psycholinguistic evidence: the beginnings of words are more psychologically salient than the ends, and ends are in turn more salient than middles; and stems and affixes are processed separately at some level. Specifically, it is argued that speakers and listeners process lexical stems before affixes. In the compositional process of determining the entire meaning of a

word from its parts, the stem has computational priority over the affix, and hence it favours the most salient, initial position in a word, while the affix selects the less salient end position. As a result, languages exhibit a suffixing preference, or stem+affix ordering, on numerous occasions when their remaining structural characteristics would predict the reverse.

Hawkins also wrote two chapters for Comrie's forthcoming volume on The World's Major Languages (Croom Helm, London). They were on 'German' and 'Germanic languages' respectively. The first gives an overview of the historical background to German, and a summary of the phonology and syntax of the modern language. The second outlines the historical developments from Proto-Indo-European up to the first records of the Germanic dialects. All the major languages (40 in all) in Comrie's book are being described according to a common format, in order to provide a ready reference work with basic historical, grammatical and demographic information on the languages in question.

Hawkins also substantially revised his latest monograph comparing English and German, now entitled A Comparative Typology of English and German: Unifying the Contrasts. This project was described in some detail in the Annual Report 1983. The contrasts between English and German are being used in order to infer a parameter of typological variation of more general validity, and to define a paradigm or check-list of linguistic correlations to be tested against other languages and families.

Comrie's main research effort in connection with the project on Language Universals, was a continuation of work on the interaction of grammatical factors and real-world knowledge in the establishment of referential networks within texts. He concentrated on the behaviour of so-called pro-drop languages,

making use of the presence of speakers of Polish, Serbo-Croatian, and Italian at the Institute and of a research visit to Malta to work on Maltese. In sentences of the type Arthur hit Basil and ran away in pro-drop languages, the most salient interpretation is that Arthur ran away, although there is a secondary interpretation under which Basil ran away, provided that Basil has been established as local topic (e.g. if there was a preceding question why did Basil run away?). This suggests that these languages have a grammatical rule allowing omission of noun phrases under identity of subjects across clauses, and a discourse rule allowing omission of subject noun phrases that have already been established as topic, rather than just a single rule allowing omission of subject pronouns.

In relation to Hawkins' typological comparison of English and German, Comrie investigated the interaction of semantic roles, grammatical relations, pragmatic roles (e.g. topic, focus), word order, and morphology in the syntax of Slavic languages, in particular Russian, Polish, and Serbo-Croatian. In terms of the syntax of individual clauses, these languages evince an even tighter fit between semantic roles and grammatical relations than does German, which Hawkins has already shown to differ on this parameter from English, where the fit is much looser. On another parameter, previously thought to be related to the first, there is much variation among Slavic languages: Russian is basically like German in disallowing extraction of material across clause boundaries, but Serbo-Croatian is as free as English in permitting such extraction (e.g. literal translations of the man that I claimed that you had hit are possible). This suggests that the clause-internal and clause-external parameters may be distinct parameters.

Comrie also began a project together with Frauenfelder on word order within the verb complex in the dialect of Bosco Gurin (Ticino, Switzerland). Bosco Gurin is an isolated German-speaking village in an Italian-speaking area and investigation of word order within an isolated and archaic dialect promises to throw important light on the historical development of word order in German and its dialects, a problem that is of great potential interest in terms of the relations between ease of processibility and language change.

Grosu continued his research on heterofunctional coordination and other violations of parallelism under comparable conditions, collecting data from a number of languages with the help of informants (among others, Finnish, German, Dutch, Swahili, and Kijaluo). He also investigated (with the help of Faltz, Arizona State University) how such constructions bear on Boolean algebra as used by Keenan and Faltz to achieve a model-theoretic interpretation. In addition, he began intensive research on the grammar of Rumanian for the purpose of determining the implications of certain constructional properties specific to this language for multi- and mono-stratal theories of syntax as represented by Government and Binding and Generalized Phrase Structure Grammar. This research has already yielded a paper on the Rumanian supine and complex adjectival constructions and will culminate in the writing of a book together with Graham Mallison from Monash University (Australia) on Rumanian complex sentential structures and unbounded dependencies and their implications for current syntactic theories; the book is to be ready by 1987.

In addition to organizing many of the activities of the Universals Project, Holmback is conducting a cross-linguistic investigation of the formal expression (or lack thereof) of definite and indefinite reference. The goal is to discover what kinds of information can be included in the same morpheme

and what kinds of information need not be formally expressed
concerning definiteness and indefiniteness.

2.5 Semantics and Pragmatics

Keenan and Moss worked on the logical semantics of
determiners.   One particularly novel feature of their research
involved the study of determiners containing more than one
common noun phrase argument. For example, <u>more</u> ... <u>than</u> ...
is such a two-place determiner, as in <u>more</u> <u>cars</u> <u>than</u> <u>bicycles</u>.
There are both syntactic and semantic reasons for considering
constructions of this kind as two-place determiners rather than
combinations of one-place determiners. In addition, there is a
mathematical theory of such determiners which parallels earlier
work by Keenan and Stavi on one-place determiners. For
example, the classes of logical and cardinal k-place
determiners were studied. A new area of model-theoretic
semantics was initiated by this study, one concerned with the
expressive power of determiner constructions. A formal
definition was proposed to measure expressive power, and
several theorems were proved. These results can be interpreted
as proofs that having two-place determiners in natural language
increases expressive power, as does having non-logical
one-place determiners.

Holmback completed a paper on accounting for scope
ambiguities in a Government and Binding grammatical framework.
Her analysis extends and modifies the standard approach to
scope in this theory and looks at data not generally discussed,
such as generic readings of definite and indefinite
descriptions. She also continued work begun in her USC
dissertation on the semantics/pragmatics of generic
interpretations of referring expressions. And she addresses
the question of the representation of scope ambiguities in a
lengthy review article (for <u>Linguistics</u>) of Reinhart's recent

book Anaphora and Semantic Interpretation (Croom Helm, London).

Hawkins wrote a paper on the pragmatics of definite reference entitled 'A note on referent identifiability and co-presence', which is to appear in the Journal of Pragmatics. In it he discusses the appropriateness conditions for the use of definite descriptions in English and argues that identifiability or co-presence (in the sense of Clark & Marshall) is neither necessary nor sufficient to guarantee successful definite reference. Instead he argues for a more abstract conception of these appropriateness conditions whereby the universe of discourse is pragmatically structured into sets of objects defined by different types of mutual knowledge criteria, and only the set as such (within which the referent of a singular definite description exists and is unique) needs to be identifiable. Hawkins in effect returns here to his 'location theory' of definite reference, presented in his 1978 monograph Definiteness and Indefiniteness: A Study in Reference and Grammaticality Prediction (Croom Helm, London, and Humanities Press, New Jersey).

Comrie continued his research on tense, investigating in particular the behaviour of tense in indirect speech and concentrating on English and Russian material. In both languages, most deictic expressions in indirect speech use the deictic center of the reporter; tense is exceptional in both languages, though in different ways: in Russian, the tense appropriate to the original speaker is retained, while in English the tense of the original speaker is retained if the verb of reporting is nonpast, but there is backshifting in tense if the verb of reporting is past. Consideration of a wide range of data enables alternative hypotheses that have been argued for to be definitively eliminated.

3. LANGUAGE ACQUISITION

The research of the language acquisition group is concerned with both first and second language acquisition.

The research in first language acquisition falls into four main areas. First, there has been foundational research investigating the theoretical bases of language acquisition research, the relationship between language development and more general cognitive development, and the relationship between language acquisition and the predictions of linguistic theory and language universals. Second, the acquisition of particular grammatical constructions has been examined in diverse languages, primarily conditional sentences, clitic and non-clitic pronouns, passives, and word formation. Third, there has been research on reference (specifically generic reference) and anaphora resolution in acquisition. Fourth, several investigators studied the acquisition of various discourse skills and sociolinguistic skills, and the growth of metalinguistic awareness.

Research on second language acquisition has continued to focus on untutored learning by adults, with the Institute providing the central coordination for the ESF research project "Second Language Acquisition by Adult Immigrants". The specific research conducted within this project during the year has concentrated on the thematic structure of learner varieties and the pragmatic structure of foreigner talk.

3.1 First Language Acquisition

3.1.1 Theoretical Foundations: Acquisition in Relation to Cognitive Development, Linguistic Theory and Language Universals

In a detailed evualation of Slobin's "Operating Principles" model as it now stands, Bowerman has identified and explored certain difficulties with the approach. This model, which has been an influential approach to language acquisition in recent years, tries to identify the principles of processing, organizing, and storing linguistic information that children bring to the language acquisition task. Although the model has led to much fruitful cross-linguistic research and yielded a number of important hypotheses, major problems of both method and interpretation remain to be solved. Bowerman argues that as the model has expanded, it has become difficult to test proposed Operating Principles directly because they often form closed systems that can interpret all observed outcomes, and because counterevidence can often be reinterpreted to be compatible with existing assumptions. A second problem is that multiple explanations for children's language behaviours have tended to proliferate within the Operating Principles approach. The predictions of alternative explanations for the same behaviours need to be systematically drawn out and tested. In assessing the explanations provided by a number of Operating Principles, Bowerman found an absence of certain errors that children should make if the principles were correct, and the presence of other errors that should not be committed. Finally, argued Bowerman, the operating principles still lack the conceptual "glue" needed to weld them into a coherent, interrelated system.

In related analyses, Bowerman has evaluated Slobin's recent proposal that there is a universally specifiable "Basic Child Grammar" that reflects an underlying ideal form of human

language. According to this hypothesis, which is related to Bickerton's proposal, based on creole studies, for a "language bioprogram," children approach the language acquisition task with a prestructured "semantic space" in which certain meanings and meaning clusters constitute a privileged set of grammatical notions onto which functors and other grammatical constructions are initially mapped. Although Bowerman agrees that there is evidence that children's starting semantic space is not a tabula rasa, passively awaiting the imprint of the semantic system of the language being learned, she argues that the meaning distinctions to which children are initially attuned are much less rigid than the "Basic Child Grammar" hypothesis predicts. Specifically, they do not define a single, privileged set of semantic notions that strongly attracts the grammatical forms of the input and molds the initial usage of these forms to a uniform pattern. Rather, they are better understood as a system of relatively accessible alternatives for structuring semantic space within any particular conceptual domain -- i.e., as a set of salient meaning distinctions that children will tend to try out first. Bowerman supports these conclusions with analyses of several major semantic domains in which children appear to be sensitive to language-specific structuring principles from the first use of the relevant linguistic forms, and with a consideration of the potential of errors in children's spontaneous speech to reveal inherent structuring principles, along with an outline of factors that must be taken into account before specific errors can be taken as good evidence for the existence of such principles.

Karmiloff-Smith continued to develop her theoretical framework which postulates deep-rooted equivalence of processes across different domains of cognitive development and language. The notion of representational rewriting and progressive explication of representational links were developed to differentiate them from, yet tie them theoretically to, human

consciousness. Comparisons have been explored with human pathological development and with animal learning in primates. An essential distinction was drawn between representational adjunction/behavioural change, on the one hand, and representational reorganization/representational change, on the other hand. It was argued that animal learning can be accounted for theoretically within the framework of the former, i.e. representational adjunction and behavioural change, whereas human development is characterized by recurrent cycles which result each time in representational reorganization and thus true representational change.

Sugarman continued her research for a theoretical book on the study of development. The main thesis of her book is that the observation of developmental change is a distinct and distinctly powerful analytic tool for discovering fundamental properties of mental functioning. Although this thesis is presupposed by research on child language acquisition, it has yet to be formulated explicitly, and its consequences for empirical research have yet to be fully explored. This is what her book is attempting to do.

In connection with the Universals Project (cf. section 2.4), Andersen organized meetings of a research group on acquisition in relation to language universals. The issues discussed included: how are constraints on language variation reflected in developing linguistic systems? what predictions do language universals make for the relative timing and order of structures acquired in languages of different types? and what predictions do they make for the types of errors made (and not made) in different languages? Participants at these meetings included Bowerman, Slobin, Eve Clark, Hawkins, Holmback and others. A workshop is in preparation for the summer of 1985 devoted to these research issues. Andersen and Holmback are also setting up an archive of child language research data from different languages at MPI, containing

information on errors and the relative timing of structures acquired within and across languages. The grammatical areas of concentration are: word order, case marking, verb morphology, relative clauses, and the lexicon.

3.1.2 The Acquisition of Particular Grammatical Constructions

Weissenborn and Friederici (in collaboration with Kail, Paris) continued their cross-linguistic studies on the comprehension of pronouns in French and in German. Further analyses of the data (see Annual Report 1983) showed that the global assumption that the subsystem of clitic pronouns in French should be harder to process and to acquire in its entirety than the non-clitic subsystem, given its marked peripheral character, cannot be maintained. Indeed the clitic pronouns, 'le, la, les' in constructions containing only one of these elements are not harder to comprehend than the non-clitic 'à lui' or the corresponding non-clitic German forms. Processing difficulties show up only in structures containing two clitic pronouns (la lui, le lui, les lui). These structures are interpreted as noun phrases by some of the younger children. This indicates that it is not the peripheral character of the clitic pronouns as such but the interaction between these and the article system as a core element that is responsible for the children's difficulties. That leads to the prediction that when the peripheral construction can, even only locally, be interpreted as a core element, younger children tend to assimilate the periphery to the core. Thus, these findings are at variance with theories that assume that peripheral linguistic elements are in general harder to process or to acquire than core elements.

Some research by Friederici focussed on the question of how the child learns to use word order and morphological information for sentence interpretation. Children's comprehension of reversible passive sentences varying word order (agent-first/patient-first) and syntactic complexity (simple passive/passive+question/passive+question+imperative) was examined. The results show that a child learning a language like Dutch, i.e., a language which has weaker word order constraints than English but similar morphological markers for passives, first uses an agent-first strategy to interpret passive sentences, independent of the actual order of agent and patient noun phrase. By the age of five years the child is able to recognize the morphological cues which distinguish passive sentences from active forms. In addition the child must have learned that in passive sentences the first noun in the sequence is sometimes the patient. The child seems to hypothesize that this is valid for all passive sentences and to construct a prototypical passive sentence schema with the structure: patient-noun before agent-noun. As a result the first noun is now consistently assigned as the patient in all passive sentences independent of the actual order of the agent and patient noun phrase. It is after the age of six years that Dutch speaking children learn to use both types of information, morphological and word order information in combination, for the interpretation of various sentence forms.

These findings suggest that the child's ability to process and to integrate different types of structural information develops in a piece-by-piece fashion. When a particular syntactic cue is brought into the orbit of the child's linguistic problem space, she will first treat it as an isolated phenomenon. It is only after the child has disentangled a particular linguistic phenomenon from other linguistic forms and has recognized it in isolation, that the child will learn to exploit the relationship between the various linguistic forms. It is only after the integration of

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various linguistic rules is finally achieved, that correct assignment of relational roles will be possible independent of the sentence surface form.

Eve Clark's main research involved writing up earlier work on the acquisitional principles children bring to word-formation, and the earliest devices they acquire, with findings based on (a) available diary literature across several different language families, and (b) data collected earlier on English and Hebrew. This work will appear as part of a monograph on the acquisition of word-formation. She also completed a paper with two colleagues (Gelman and Lane) on chidren's acquisition and use of noun-noun compounds in English for talking about contrasts between categories (now in press).

Bowerman completed her cross-linguistic study of the acquisition of conditionals (if-then constructions and their equivalents in other languages) (cf. Annual Report 1983 for details of this project).

3.1.3 Reference and Anaphora Resolution in Acquisition

Karmiloff-Smith initiated a project on children's representations of generics, both from the linguistic and conceptual viewpoint. In a much earlier study, she had shown that children experienced extreme difficulties with understanding reference to non-instantiated referents (e.g., "the lion is a dangerous animal" can be interpreted as either being a deictic reference to a specific lion seen in the zoo, or as referring to its logical extension, i.e. all the lions in the world). It is not before roughly 10 years of age that children understand the generic function of the definite article (or the generic function of zero-marked plurals, e.g. "lions are dangerous") as a non-instantiated reference. It is hypothesized that two parallel developments cause this time lag. On the one hand, the child's memory entries have to be

reorganized so as to account conceptually for the generic (and various models of memory organization have been used to try to account for this, the most promising up to now being Morton et al.'s "Headed Records" model). On the other hand, and this has been neglected by most developmentalists, the child has to come to grips with the fact that linguistic markers which served instantiation functions, the most obvious being the deictic, finally also have to serve non-instantiated referential purposes. It was thus essential to devise two very different techniques, one linguistic and one totally non-verbal, to take an initial look at these issues. These are being piloted at present and will be reported on in next year's report.

Deutsch, in cooperation with Charlotte Koster and Jan Koster (Tilburg University), continued his research on children's interpretation of anaphoric relations. The majority of experiments on the acquisition of anaphora have typically looked at the acquisition of either bound or free anaphora and have sought to substantiate one opposing theoretical position or the other. Those that investigate bound anaphora try to show that the correct use and interpretation of this class of anaphora is guided by a particular kind of linguistic knowledge that is part of "Universal Grammar" and has only to await the right environmental triggers to become effective.

Studies of the acquisition of free anaphora (non-reflexive pronouns, for example), on the other hand, strongly emphasize the notion that children require a long time to learn to use and understand this class of anaphora. In contrast to the usual concentration on only one type of anaphora, Deutsch's research attempts to focus on both types simultaneously. He conducted an experiment to investigate what role particular error types play in the resolution of anaphoric relations, in order to discover precisely how and why certain kinds of errors are made by children in resolving anaphora.

In this experiment three groups of Dutch children (age 6,

8 and 10 years) listened to sentences in which two brothers
were named as potential antecedents for the following reflexive
or non-reflexive pronoun. Furthermore, the test sentences
contained only verbs that could appropriately express both
reflexive and non-reflexive relations. For each test sentence,
subjects were required to choose from among four pictures the
one that best matched the sentence. The picture array was
composed so that only one of the four pictures was the correct
choice. The analysis of errors in this experiment suggests
that only a small part of the incorrect responses to both types
of anaphora can be explained in terms of insufficient command
of the lexicon. The main source of errors seems to be problems
in the correct determination of coreferential relations by the
children. Children do not make errors only in the resolution
of coreference relations between non-reflexive pronouns and
their antecedents, but also in the resolution of reflexive
pronouns. The appearance of these errors is not consistent
with a position which holds that the resolution of bound
anaphora is a part of the repertoire of linguistic knowledge
which, at some juncture in the acquisition process, simply
springs into being. The results of this experiment give no
indication that the resolution of the two types of anaphora
occurs in separate, sequential phases in acquisition. The
critical difference appears to be only in the rate of
acquisition. The differences between the age groups in this
experiments suggests that the productive use of reflexive
anaphora approaches the adult version somewhat faster than
non-reflexive anaphora. Deutsch surmises that the differential
rates of acquisition are linked to structural characteristics
of the two anaphora types. It may be easier for children to
learn the interpretation of linguistic structures which
formally involve "c-(onstituent) command" than those structures
which do not represent "c-command". But whether children
resolve sentence-internal anaphora as adults do depends on
factors other than just the structural differences between

types of anaphora, for example the syntactic form of sentence subject.

3.1.4 The Acquisition of Discourse Skills, Sociolinguistic Skills, and Metalinguistic Awareness

Hickmann continued her research on the development of discourse and metalinguistic skills in three ways. First, she continued her study of how children "repair" disruptions in the referential cohesion of stories. Last year's results showed that 4 year-olds often repaired deviant referential expressions when retelling whole narratives, as well as when repeating sentences extracted by the experimenter "on line" as she read these narratives. However, 7 and 10 year-olds repaired them more often and only the 10 year-olds could repair them explicitly in a metalinguistic judgement task. This year's analyses show that children's performance in the retelling task was similar when the referential expressions denoted animate and inanimate referents. This result was unexpected and requires further studies, given Hickmann's previous analyses of narrative productions that showed an effect of animacy on children's uses of referent-introduction. In addition, children's repairing ability was assessed in the case of expressions with indefinite determiners which could be interpreted as not denoting any specific referent given their semantic context and which were therefore appropriate even if they occurred after the first mention of a specific referent (e.g., "he saw a bike, he wanted a bike..."). In the repetition task children of all ages frequently reproduced indefinite determiners when such a non-referential interpretation was possible, whereas they changed them to definite ones when this interpretation was not possible. However, the 10 year-olds showed a tendency to replace indefinite determiners with definite ones even in the former case, indicating that they might use the story context more and

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impose coreferential relations among NP's even when they are not necessary. Finally, Hickmann began some pilot studies to relate children's repairs of referential cohesion and of story structure. Story grammarians have reported that displacements of story units away from their "expected" position affect children's story retelling (e.g., decrease in recall, reorganizational strategies). However, such displacements in the stimuli of these studies often created simultaneous disruptions in the cohesive sequencing of coreferential expressions. The pilot studies aim at separating these two aspects of the stimuli in order to determine whether the reported effects can be unambiguously attributed to children's uses of "story schemata" per se and/or to their combined uses of some rules governing the organization of cohesive linguistic devices in ongoing discourse (e.g., coreferential NP's introducing referents and maintaining reference to them, temporal/aspectual distinctions in verbal inflections, adverbials, connectives).

Hickmann also began new analyses of children's uses of cohesive elements when reporting speech in narrative discourse. Her previous results showed a developmental progression in the uses/non-uses of explicit "framing" devices (e.g., "he said (that)..."): seven- and ten-year-olds (and adults) systematically used such devices, whereas four-year-olds often did not do so. Hickmann's further analyses of both adults' and children's narratives focus on the functions of various utterance types that can be used to report speech without explicitly referring to it. For example, it is possible to report dialogues by describing their content, instead of quoting them explicitly (e.g., "the dog bought a present", instead of "the dog said, 'I bought a present'") or by describing the internal states of the quoted speakers that can be inferred from their speech (e.g., "he thought that...", instead of "he said that..."). Preliminary results suggest the

hypothesis that, when organizing a complex series of quotations in narrative discourse (rather than simply producing isolated quotations), children do not at first mark an unambiguous differentiation between reporting and reported speech with explicit metalinguistic references to speech.

Hickmann and Weissenborn began a joint cross-linguistic project on the role of children's temporal/aspectual elements in the organization of narrative discourse, e.g., interactions among their uses of tense-aspect verbal markings, connectives, and adverbial elements. They elicited narratives from English-, German-, and French-speaking children between four and ten years with picture sequences, asking them to narrate them for a "naive" interlocutor who could not see them because of a blindfold and who then had to tell the stories back to them. Preliminary analyses of a small sample of narratives were begun in collaboration with Edwards in the context of the Temporality Workshop (June-July). As expected, the data showed a relation between semantic verb-types and verbal inflections, e.g., punctual activity verbs in French are inflected in the past with the "passé composé" or the "passé simple", whereas durative, stative or iterative verbs are inflected with the "imparfait". In addition, these uses interact with other elements, e.g., punctuality is often also marked at the beginning of utterances with adverbials (e.g., "soudain"). Further analyses were begun to determine the functions of tense-shifts (e.g., from past to non-past or from one past inflection to another). Hickmann and Weissenborn are continuing this study with a larger sample of narratives in English, German and French, as well as in other languages (Navaho, in collaboration with Vera John-Steiner from the University of New Mexico, and Chinese, in collaboration with researchers at the Universities of Peking and Leiden). The study will also vary the types of narratives elicited and the narrative situations used (e.g., fairy tales without pictures).

Romaine continued her work in socio-cultural linguistics and anthropological linguistics. One project, funded by the Social Science Research Council and based in Birmingham, England ('Language Loss and Maintenance in a Multi-ethnic Community'), has been completed. The project was a sociolinguistic study of Panjabi speakers, whose aims were to investigate the present range of language skills and patterns of language use and what the attitudes of the community were to changing patterns of language use and language maintenance. Although a high degree of bilingualism now exists in the Panjabi-speaking community, this cannot be equated with language shift; nor does switching or mixing between the languages necessarily indicate incipient loss. An important factor in the present situation is the use of code-mixing or switching as a discourse strategy. Continued analysis of the data collected is being carried out, particularly with regard to the syntactic and semantic constraints on code-switching.

A second project was initiated to study first language acquisition, creolization and language change in Tok Pisin, spoken in Papua New Guinea. Both these projects are concerned generally with the study of language acquisition in its social context, and the way in which the study of language contact and language mixing can contribute to a more general theory of language change and development.

During his brief visit to the MPI, Warden continued his work on children's understanding of the speech acts of asking and telling, as a part of their discourse skills. The direction this work is taking is (a) to develop a range of methodologies for assessing children's "lexical knowledge" and (b) to try to establish a developmental pattern to children's sensitivity to different sources of information as guides to their interpretation of what utterances mean.

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Weissenborn continued his work on the development of communicative competence. The ability to detect, to overcome, and to avoid misunderstandings is a central component of communicative competence. The development of this ability was studied cross-sectionally (7 to 14 year-olds and adults) in an interactive setting. The results indicate that four main stages can be distinguished in this development: (1) the illusion of understanding or generalized misunderstandings, (2) the detection of misunderstandings, (3) the understanding of misunderstandings, and (4) the anticipation of misunderstandings. These stages are explained by children's growing control over contextual parameters through the successive integration of specific cognitive, interactive, and linguistic skills needed for the establishment of frames of reference. In accordance with other authors (Flavell 1981, Karmiloff-Smith 1984, Miller 1984, Tunmer & Herriman 1984) the study stresses the development of metaprocedural knowledge as an important factor in the ontogenesis of complex (verbal) behaviour.

Andersen's major research activity as a guest at MPI was the revision of her book Speaking with style: The Sociolinguistic Skills of Children, which will be published by Croom Helm in 1985. In this book she examines children's awareness of the sociolinguistic rules that govern appropriate language use, exploring (i) the repertoire of registers young children possess; (ii) the linguistic devices they use to mark distinct registers; and (iii) the way skills in using these registers develop. In addition, she continued work on blind children's language acquisition, focussing on the contribution of sibling/peer input. A longitudinal study of interactions between blind and sighted dyads (1-5 years old) indicates that siblings often mirror their parents' input style in interactions with the blind child. For example, siblings whose parent's style is predominantly directive and label-oriented

also tend to use a higher frequency of imperatives and labels in addressing their younger siblings. Sibling/peer input differs from adult input, however, in its lack of accomodation to the needs of the blind child, thereby placing a greater demand on the child to be pragmatically appropriate and to accomodate to the world. Sibling/peer interactions also provide the blind child with a model of the linguistic strategies which allow children to gain and maintain access to peer groups. Such strategies include attention-getting, group inclusion, topic negation and maintenance, and conflict resolution techniques. These devices, in the form particular to peer groups, appear to be learned only from siblings and peers, and are crucial to acceptance in mainstream situations.

Herriman analysed data from a large scale study of metalinguistic awareness in beginning school children in Western Australia, developed a sampling plan for a study of Thai language abilities and attitudes in Malay speaking Muslims in South Thailand, and completed a paper on metalinguistic awareness and the growth of literacy. He also presented talks on his work to colleagues at the University of Geneva and the Free University of Brussels.

3.2 Second Language Acquisition

3.2.1 The ESF Project

The aim of this project is to gain some insights into the "logic of adult language development", by describing the process of spontaneous second language acquisition (SLA) by forty adult immigrants in five countries (England, Federal Republic of Germany, France, Netherlands, Sweden), and by attempting to isolate the various factors that determine the structure and tempo of this process. The study is cross-linguistic, with ten different source language

(SL)/target language (TL) pairs, and longitudinal, involving
regular interviews with informants and participant obervations
of their social environment. It will be completed by smaller,
cross-sectional studies of a control group, groups of
long-resident immigrants, and groups of native speakers of the
TLs. A longer description of the objectives and organization
of this project appeared in the Annual Report, 1981.

Barring major accidents, complete sets of data will have
been collected from all the longitudinal informants by the
summer of 1985. Some data collection from the other informants
will continue after this date. This phase of the project will
therefore be completed six months behind the initial schedule.
Progress in data transcription and storage on the computer has
fallen correspondingly behind schedule. This means that the
data base for the first year of full analysis - 1985 - will
necessarily be smaller than originally envisaged. However, the
major algorithms for computerized data treatment (reformatting,
type/token, pattern search, etc.) have been completed by
Edwards at the Institute, for use by the local teams.

The delays mentioned above were discussed at the 1984
meeting of the project's Steering Committee: it was agreed
that they were due mainly to ertswhile financial/adminstrative
difficulties beyond the control of project researchers. The
decision was therefore taken, and subsequently ratified by the
Standing Committee for the Social Sciences at the ESF, to
extend the project for an additional six months. The Steering
Committee also discussed progress in the research areas
selected for pilot analysis in 1984, which were: (1) learners'
organization of their utterances in selected tasks; (2)
spatial reference; (3) misunderstanding and repair in
interactions between learners and native speakers; (4)
strategies for conveying lexical meaning. The majority of the
analyses were cross-sectional, and based on data from learners
of one TL.

For (1) and (2), the methodological framework developed

during 1982 was considered to be adequate for full, cross-linguistic analysis in the coming year. For (3), it was decided to narrow the questions addressed and to concentrate on the process of learners' progressive understanding of the TL, and on feedback giving and elicitation. (4) will be supplemented by a study of lexical growth. Lastly, the study of temporal reference, having received much attention by project researchers during the past year, was added to the list of priorities. In sum, it will not be possible to address in 1985 all the research questions originally listed in the project's Field Manual. A representative sub-set of these questions will, however, be researched, now from a cross-linguistic and longitudinal perspective, and with a reduced data base. The Institute provided the overall co-ordination of this research (Klein and Perdue), and its members participated directly in the work on utterance organization (Klein and Perdue), discussed in 3.2.2. Much of the SLA input to the temporality workshop organized by Klein and Perdue (see 'Other activities", section 2.) was provided by ESF research associates: Klein, Perdue, von Stutterheim, Edwards; Noyau (Université Paris VIII), Simonot (Ealing College of Higher Education) and Trévise (Université Paris X).

3.2.2 Structure of Utterances in Learner Varieties and
       Foreigner Talk

In order to account for the "logic of development" (see 3.2.1) in SLA, two preliminary questions must be addressed:
1. How to characterize the linguistic repertoire of the adult acquirer at any given time in the acquisition process (his 'learner variety');
2. How to characterize the way he applies his repertoire to solve verbal tasks.
In a pilot study, Klein and Perdue examined these questions in relation to the way in which adult acquirers organize their

words into utterances in connected discourse.

Informants were an Italian acquirer of German, an Italian acquirer of English and a Spanish-speaking acquirer of French. A 'pre-structured' task was chosen for analysis, which allowed some control over the mutual knowledge of informant and investigator at its outset, and over the content which the informant was attempting to convey: informant and investigator watched the first half of a twenty-minute film together; the investigator then left the room leaving the informant to watch the second half of the film. The informant was then asked to re-tell what the investigator had not seen.

The study encountered and carefully examined the well-known, but often underestimated, problems of the identification of words (as opposed to e.g. formulaic expressions) and the classification of these words into classes (N, V, Prep. etc.). To the extent that the identification of the major constituents of informants' utterances - termed here nominals and verbs - is reliable, then the _form_ and _position_ of a nominal in respect to its verb depended on two overall factors:
(i)   whether its referent had already been referred to or not;
(ii) the semantic case relationship holding between the nominal
      and the verb.
For (i), if an entity had been referred to before, the _form_ of the referring nominal - definite NP, pronoun, nominal left unexpressed - crucially depended on the notion of adjacent utterances: utterances were 'adjacent' if they followed one another on an identical 'level' of the story (story line, explanatory side sequences, 'metapragmatic' comments) and within recognizable episode boundaries in the story.

For the _position_ of nominals with respect to verbs: although there was a general tendency in an utterance with two nominals and a verb for the first nominal to refer to a 'given', and the second to a 'new' entity, the 'given/new' distribution did not account for all regularities, and in

particular was in 'competition' with the semantic case
relationship (ii) between nominal and verb. Thus for two of
the informants, if a 'new' entity was also agent of the verb,
then the nominal referring to it was placed in first position
even if the other nominal referred to a 'given' entity. The
semantic relationship between nominal and verb also governed
their relative position in utterances containing only one
nominal.

The major regularities of the organization of constituents
in the informants' utterances could be accounted for (with a
few exceptions) by this 'coalition' (Bates) of semantic case
relationships and the complex discourse-organizational
principle based on previous reference and 'adjacency'. This
'coalition' is specific to the sentence-types of none of the
source- or target-languages of the informants of this study.
Phenomena such as case or number morphology, verb inflection,
and morpho-syntactic agreement in general, which play a major
role in the sentential organization - 'subject', 'object', etc.
- of the languages were precisely not those operative here,
because the corresponding linguistic devices were not
systematically part of the informants' repertoires. (The
'weakest' had no inflexional morphology whatever - except when
he quoted speech of others; the most 'advanced' tended to use
his embryonic morphological means as one device for signalling
off explanatory side sequences from the storyline). It is
correspondingly pointless to address questions 1 and 2 using
sentential-descriptive functions such as 'subject', and it was
suggested that a careful examination of what was operative and
not operative in the description of reduced systems such as
those of these informants might have implications also for
universal statements - in SLA or elsewhere - based on
sentential-descriptive categories of well-studied languages
such as the source- and target-languages of these informants.

Proceeding with his analysis of utterances in foreigner
talk (hereafter 'Xenolect') by German native speakers in
conversation with guest-workers, Roche examined representative
and authentic data from various social settings, and instead of
characterizing the deficiency of surface phenomena (e.g.
omissions, generalisations) he developed a functional-pragmatic
approach to the underlying regularities.

It was found that the basic structure of Xenolect
utterances can be described as consisting of three linearly
ordered main parts with systematic and linearised options for
expressing temporality, space, modality, negation and other
concepts. The temporal-spatial and thematic frames occur in
interchangeable order in utterance-initial position, followed
by one or more focus-events. No further lexical or
morphological marking is necessary for relating those
focus-events to the temporal-spatial and thematic frames.

In the following example,

"gestern abend, Gasthaus oben, Heiner ich, viel trinken, viel
essen"

"gestern abend" (yesterday evening) marks the temporal frame
which remains active until the introduction of a new reference
point. "Gasthaus oben" (bar up there) provides the
localisation and "Heiner ich" (Heiner I) introduces the
protagonists as part of the thematic frame. They are followed
by a number of individual events relating to them (much drink,
much eat).

In order to investigate speaker- and addressee-related
factors provoking Xenolect-utterances, the conversations of
eight speakers with each of seven addressees were analysed in
more detail. For three major adaptation levels that were
identified the following regularities were found: a)
speaker-specific differences in the choice and use of
adaptation devices; b) addressee-related differences in the
extent but not in the relative distribution of the speakers'

adaptations.

   A more detailed analysis of speaker-specific and addressee-related differences in the use of the adaptation devices shows triggering effects in the pragmatic structure of utterances. Future work will concentrate on the elaboration of a framework that will be able to relate the use of adaptation devices to the pragmatic structure of Xenolect utterances.

4. LANGUAGE DISORDERS

1984 was the third year of the ZWO-priority-project "Aphasia in Adults", a joint venture of the Institute and the Interfakultaire Werkgroep Taal- en Spraakgedrag of Nijmegen University. The central issues are outlined in the Annual Report 1983. The common denominater of the investigations was an emphasis on the phenomenon of agrammatism and the alternative explanations available for accounting for the syntactic deficits in agrammatic patients. Despite this common denominator, the investigations by various members of the project grew out of quite different theoretical backgrounds. Nevertheless, many of the studies from 1984 converged on one common central issue, namely the idea that whatever we observe and measure in the aphasic patients' behaviour is not directly determined by the impairment of a given language processing unit, but rather by intervening strategies via which the patients try to adapt to the deficit. The telegraphic style in the spontaneous speech of certain agrammatic patients has become the anchor point for arguments and reasoning about adaptation theory. Although there is still much disagreement in the group as to the nature of the underlying deficit to which the agrammatics have to adapt, as well as to the precise mechanisms of the adaptation, the idea of intervening adaptive factors has become a point of common concern in the group. Thus, the year 1984 was a year for developing cohesion in the general conceptual framework.

It may be difficult to detect just what the relationship is between the work of Friederici and Eling on the role of closed class items, as well as morphology, in the processing deficits of agrammatics (see sections 4.1.1 to 4.1.3), and the work of Kolk and Heeschen on the adaptation theory. However, in pursuing the original issues of the project (differential

disturbances in processing closed and open class elements in different types of aphasics under on- vs. offline conditions), both Friederici and Eling found that the grammatical abilities of agrammatic patients are much better preserved than one may be inclined to believe.

Friederici specified more precisely the conditions under which the different processing disturbances hypothesized to underly Broca's and Wernicke's aphasics can be expected to show up. Thus, in the experiments reported in 1983 the finding of similar results in Broca's and Wernicke's patients was explained by making the assumption that similar strategies were used in both groups and that this obscured any hypothesized differences in underlying deficits. The work of Heeschen in 1984 representes an attempt to try it the other way around: the assumption was made that observable differences between groups under well specified conditions are due to different strategies that, in turn, obscure the identity of the hypothesized underlying deficit. Note, however, that in both approaches it is assumed that the behaviour of the patients is the joint product of the deficit itself and some intervening factors.

Another general point to be mentioned here is the progress in building up a pool of patients for experiments. The recruiting of the patients in the Netherlands coincided with the need of having a large number of patients tested with the Dutch version of the Aachener Aphasie Test (Huber et al., 1983) in order to standardize this version. Due to the kind cooperativity of many clinical institutions, a sufficient number of patients have been tested such that the final statistical evaluation of the AAT can be started in cooperation with Willmes and de Bleser (Department of Neurology, Aachen).

4.1 Open and Closed Class Elements

4.1.1 Input Factors in Processing Closed Class Elements

Friederici and Weissenborn (in collaboration with Kail, Paris and the Laboratoire Theophile-Alajouanine, Montreal) completed their cross-linguistic work on the comprehension of pronouns (see Annual Report 1983). The comparison of Broca's and Wernicke's aphasics in German, Dutch and French allowed the role of different input factors for the processing of pronouns to be factored out. By using different languages the study varied (a) the phonological status (clitic/non-clitic), (b) the syntactic structure (prepositonal/non-prepositional, pre-/postverbal) (c) semantic and morpho-syntactic factors (number, gender and case). A total of 20 German, 16 Dutch and 14 French speaking aphasics were tested. Within- as well as cross-language comparisons were carried out. A comparion between Dutch and German as well as the within language comparison in Dutch showed that the additional marking of the pronoun by a preposition does not affect Broca's aphasics' performance. Wernicke's aphasics, however, seem to gain facilitation in processing pronouns when they are marked by a preposition. The comparison of French to Dutch and the within-language analysis of French indicate that phonological status is not a major factor in Broca's aphasics' processing of pronouns. Although French-speaking Broca's aphasics process non-clitic object pronouns better than their clitic forms, no difference was found when comparing non-clitic indirect pronouns and clitic direct object pronouns. It seems that the observed difference between the clitic and non-clitic indirect object pronouns cannot be attributed to the item's phonological status but is rather due to the fact that the clitic forms are form ambiguous ("lui, leur") whereas the non-clitic forms are not ("a lui, a . elle, a eux, a elles"). The relatively good performance on the clitic direct object pronouns supports this

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interpretation. For Wernicke's aphasics no effect was found for the factor of form ambiguity, the phonological status, and thereby the marking by a preposition. The combined cross-linguistic results suggest that - at least in the case of French pronouns - it is not phonological status which determines Broca's aphasics' processing of closed class elements.

4.1.2 Word Order and Morphology

Previous on-line and off-line comprehension studies of Friederici and collaborators had shown that agrammatics are able to recognize closed class items not only as elements of their language but also as elements which employ some structural function - without, however, being able to automatically and fully access the syntactic information given by closed class elements. The agrammatic deficit was specified as the inability to fully use the syntactic information of these elements, whereby the ability to process word order is retained. Flores d'Arcais' work on normal subjects (see Annual Report, 1981) has shown that readers whose eye fixations were recorded were not disturbed by minor syntactic violations as long as semantic interpretation survived, whereas violations of semantic-pragmatic constraints were easily detected. Although normal readers were not able to report the syntactic violations, recordings of the eye fixations indicated that these violations were realized at some level. Given these two lines of investigation, Friederici and Flores d'Arcais designed a study to examine the agrammatic's sensitivity to syntactic violations (word order and morphology) in visually presented sentences. The study involves sentences which contain different types of prepositional forms (syntactic, obligatory, lexical preposition and verb particles). Each of these sentences is varied with respect to word order whereby some word order configurations are grammatical and others are not.

The subject's eye fixations are recorded while reading these sentences. Pilot work with one case of agrammatic Broca's aphasic suggests that this approach is a fruitful one. This agrammatic patient demonstrated overall longer eye fixations than normals. When confronted with short and syntactically simple sentences the pattern of eye fixations looked very similar to that of normals. When reading more complex grammatical sentences he showed markedly longer eye fixation on closed class elements than on open class elements - a pattern which is the reverse of normals. Eye fixations also indicated that he was able to detect grammatical violations in simple sentences. Further research with a larger group of patients is needed in order to document whether the pattern observed in this single patient is representative of Broca's aphasia.

4.1.3 Morphological Structure and Lexical Access

As reported in the last Annual Report Eling did not find an effect of derivational suffix on word recognition for normal control subjects. The same experiment was done with Broca's aphasics. In the literature it has frequently been claimed that Broca's have specific problems in processing closed class elements, to which derivational suffixes belong. Contrary to this claim Broca's reacted to morphologically complex and simple words in a manner similar to that of controls, indicating that they did not have specific problems with derivational affixes. Currently, inflectional suffixes are studied in the same group of subjects.

4.1.4 Open and Closed Class elements: Two Basic Categories?

Kean pursued her research on whether the closed class/open class distinction can be stipulated on syntactic category. Pilot work in English suggested that this is not the case (see Annual Report 1983). Kean is now carrying out an expanded

version of this English study in Dutch with both normal and aphasic patients. If it turns out to be undeniably true that differences __within__ the categories of closed and open class elements, respectively, can be as large as the differences between the 2 categories and that - the other way round - differences between the categories can be smaller than within differences, then there is no rationale any longer for maintaining the closed-open difference as basic, and the basis of accounting for the various manifestations of aphasia in terms of closed versus open class elements breaks down. Such a consequence would be one moment among various others to encourage Kolk and Heeschen to try out a completely different view on aphasia and on agrammatism, in particular, within the framework of an adaptation theory.

4.2 Adaptation Theory

Kolk (Department of Psychology, K.U. Nijmegen; associated to the ZWO-project) and Heeschen obtained, independently, data from agrammatic patients which - they felt - were incompatible with any existing theory of agrammatism and more than that: incompatible with the general methodological assumptions guiding the research on agrammatism. In consequence, they elaborated - again independent of each other, at least in the beginning - the adaptation theory of agrammatism; the 2 versions of this new approach are laid out in a reader on agrammatism, edited by Kean (to appear, Academic Press, San Diego). The relevant findings were:

- Kolk found a patient with pronounced agrammatism in language production, but with a completely preserved language comprehension.

Heeschen became aware of the puzzling fact that in
spontaneous telegraphic speech there is some sort of a
regrammaticalization or grammatical readjustment. If, for
example, the target is a noun phrase consisting of definite
article + adjective + noun ("der schöne Mann") and the
definite article is omitted – as very common in the
telegraphic style - then the inflection of the adjective is
changed; it takes on the ending of the strong inflection -
precisely what it should if not preceded by a definite
article ("der schöne Mann" ⟶ "schöner Mann"). Similarly,
if a finite verbform is replaced by the infinitive – once
more a common phenomenon in telegraphic speech - it appears
at the end of the sentence, just the right place for a
nonfinite verbform in German and Dutch ("der Mann trinkt
Bier" ⟶ "Mann Bier trinken"). As a matter of fact, Kolk
analysed a large body of recorded telegraphic speech and
detected only 8 errors in a total of 1633 contexts for a
grammatical morpheme. Thus, it appears that agrammatic
telegraphic speech is rule-governed and it is to be
considered whether these rules are the same as the rules of
ellipsis in normal speech.

In order to explore this intriguing phenomenon of "correct"
telegraphic speech in a more controlled situation Heeschen
analysed the utterances of 15 German speaking agrammatic
patients and 15 paragrammatic (Wernicke) patients. These
utterances were produced under the following conditions:
the patients were presented pairs of 2 pictures; each
picture showed 2 persons involved in an activity – in one,
person A was the actor and person B was the object, while
in the other the actor-object-relations were reversed. The
patients had to choose one member of a pair and then say a
sentence so that somebody who did not know the patient's
choice could infer it from the patient's sentence. Thus,
the patients were forced to use case markings, in

particular case marked articles, i.e., elements which in spontaneous agrammatic speech are notoriously omitted. The percentages of omitted, wrong and present correct case markings were computed per individual patient. The experimentally elicited speech was compared with stretches of the patients' speech taken from perfectly free and relaxed conversations. Here once again the percentages of omitted, wrong and correct case markings were counted. The results in terms of mean percentages are:

spontaneous

	correct	errors	omissions
Agrammatics	52%	0%	48%
Paragrammatics	65%	24%	11%

experimental

	correct	errors	omissions
Agrammatics	59%	18%	23%
Paragrammatics	68%	18%	14%

Statistical analysis revealed that the pattern of paragrammatic speech did not differ significantly in the 2 conditions "spontaneous" versus "experimental". However, the agrammatic speech is dramatically different in the 2 conditions: in the spontaneous speech there is (as expected) an enormous amount of omissions (48%) which drastically decreases in the experimental speech (23%). However, this decrease of omissions is almost entirely due to an increase of errors: 18% in the experimental speech and literally no error at all in the spontaneous speech.

The results can also be expressed in the following way: while the distributions of omissions and errors are strongly opposed in the spontaneous speech of agrammatics and paragrammatics, there is no group difference in the "pressed" experimental situation.

However, in one respect there was a difference between the two groups in the "experimental" condition: While the paragrammatics' production was fluent and effortless, the production of the agrammatics was very laborious, full of attempts of self-corrections and full of interpreted curses and self-blaming comments; frequently, agrammatic patients acted on the verge of a catastrophe reaction and the experimenter had to interfere several times. These data and observations lead to the following assumptions:

(1)   the telegraphic style of the agrammatics is a means to avoid the trouble causing grammatical elements; in particular, by this avoidance behaviour the patients protect themselves against the catastrophe reaction. Thus, the telegraphic style is the product of trouble-preventing adaptive strategies rather than the immediate product of the deficit itself.

(2)   Point (1) implies that the agrammatic patients are _aware_ of this specific trouble with grammar. The development of the grammaticality judgement test mentioned in 4.3.2 serves the function of testing this hypothesis: Is an agrammatic patient able to recognize grammatical errors including errors in his own speech? If so, the fact that he cannot produce what he wants to produce is the source of the impending catastrophe reactions against which the patients protect themselves by applying the telegraphic style.

(3)   Speaking in the telegraphic manner is _optimal_: the patient is free to speak telegraphically or to try to speak in complete sentences. As a matter of fact we have observed

very frequently that patients use the telegraphic style only in relaxed conversations and switch over to the vexing attempts of speaking in complete sentences as soon as the situation gets the atmosphere of a more formal test session.

Thus, the essence of the adaptation theory is the assumption that the two classical types of aphasics (Broca vs. Wernicke) have the same underlying deficit and that the strikingly obvious differences in the manifestations of the deficit are due to an intervening adaptive strategy in the Broca-patients. This assumption brings about a series of new empirical questions which will guide the future research of Kolk and Heeschen.

4.3 Other Research

4.3.1 Language Specific and Syndrome Specific Patterns in Aphasia

Friederici in collaboration with Bates (UCSD, see Annual Report 1983) and others studied the use of structral cues (word-order/morphology) and lexical-semantic cues (animacy) in comprehension for Broca's and Wernicke's aphasics of different language backgrounds. The study included a strong word-order language (English), a weak word-order language (Italian), as well as case inflected languages (Serbo-Croatian and German). Patients received a number of grammatical and semi-grammatical sentences which varied the factor of word order, subject-verb agreement and animacy. The data from different languages suggest that, although patients' interpretations are predominantly based on those language-specific cues which are also used by normal listeners, morphology seems to be most vulnerable in all languages

4.3.2 Kean, Blomert, Koster, and v. Mier have developed a test called the Everyday Language Abilities Test (ELA) in order to study verbal and communicative competence in aphasics. Patients are read scenarios of everyday life situations - calling the doctor, dealing with a sales clerk, etc. - and their task is to respond as they would in such situations. Responses are scored for comprehension of the situation and for whether or not the response is normal or merely communicatively adequate. The scoring system was based on normal subjects' responses to the scenarios; in all cases there is massive consistency in the control subjects' responses. At this point the test is "standardized" on a large group of normals and a large group of aphasics. In addition to providing some measure of the subject's communicative competence, the data collected will be used in developing a corpus of spontaneous speech.

Kean, Blomert, Koster and v. Mier have also developed a grammaticality judgement test for aphasics in which patients are presented 50 sentences reflecting a systematic set of syntactic properties to judge; following each judgement the patient is probed. The rationale for the probe is that one can make a "correct" response for the wrong reasons and an "incorrect response" for the right reasons. This test provides data on metalinguistic and comprehension capacities which is syntactically explicit; such data are not provided by available neuropsychological instruments. Furthermore, this test can be used to consider syntactic capacities in Broca's aphasics; recent studies have indicated that they have no deficit on such tasks. The pilot work in developing the judgement test provides data contradicting this claim. At this point the materials are "standardized" on a large group of both normals and aphasics.

4.3.3 On-Line Comprehension

Tyler's work in aphasia focussed on building an on-line processing profile for individual patients. The preliminary data from one patient gives a flavour of the research. This patient, who was classified on the Boston exam as a typical agrammatic Broca, was tested on a number of on-line experiments designed to probe a range of processes involved in language comprehension. In one study, the patient showed that he was unable to construct a syntactic representation spanning an entire utterance. However, further studies showed that this was not part of a generalised syntactic deficit since he retained the ability to use some types of syntactic information. For example, he remained sensitive to syntactic restrictions on verb-argument relations and he was able to exploit the syntactic cues marked by certain types of function words. This pattern suggests that this patient is unable to construct 'global' syntactic representations spanning an entire utterance, although he is still able to construct 'local' syntactic phrases. Further experiments are currently underway to test this hypothesis.

4.3.4 The Relation between Language Pathology and Brain Pathology

Blomert (in cooperation with the Max-Planck-Insitute for Neurological Research, Cologne) investigated the relation between language pathology and brain pathology by means of PET (positron emmision tomography) and CAT (computerized axial tomography). The findings of 1984 were as straightforward as they were puzzling. Classic localization theory could account for some of the data, but was at a complete loss for the other results. Modified forms of classical theory, mainly based on CAT research of the last decade, were only partially helpful in explaining the findings. The preliminary data show that as a

rule the metabolic lesions covered a wider brain area than the
structural lesions. Besides this, in a number of cases the
metabolic lesion was found to cover brain areas which would
theoretically not be expected on the basis of the language
pathology.

OTHER ACTIVITIES 1984

1. Activities of the Technical Group

The number of experiments which were conducted over the whole year on the institute's computers increased remarkably. To cope with the increased demand for experimentally-oriented computer use the technical group purchased a PDP11/73 and developed the Micro-Max, a Z80 based Micro-computersystem. It is portable and can be used in the field for various experiments including high resolution graphic stimulus presentation. The Micro-Max can be configured to the special needs of an experiment and makes use of the whole set of interfaces developed during the past years by the technical group. The technical group will continue this work by developing more efficient and flexible software tools.

The Vax memory has been extended as well as the number of connections; as a result nearly all staff members now have a terminal and the machine is heavily used. A new debugged EUNICE version has been installed also allowing a UUCP data link to other scientific institutions. To cope with the increased demand for word processing a set of IBM-compatible Personal Computers have been purchased.

In the field of speech handling, the technical group implemented a final version of the speech editor with enhanced functionability, and a new intonation package with a pitch detector which is still based on harmonic structure analysis but also offers detailed segmental information. Further, the acoustic/phonetic properties of speech have been studied extensively by means of a filter bank approach. A first dynamic programming algorithm has been implemented to test the chosen preprocessing techniques with the intention to realize a real-time wordspotter. This work will be continued in 1985.

Much of the time of the technical group was dedicated to developing detailed plans for a local area network, to a new multi-user speech lab, to the Child Language Data Exchange System (in cooperation with Carnegie Mellon University), and to plans for the new building. All will have to be realized in 1985 and partly in 1986.

To run an experiment in the Space Lab Mission D1 the technical group built a kind of helmet which allows presentation of visual stimuli while at the same time excluding any visual information from the environment.

The technical group organized the Dutch Psychology Laboratories computer workshop 1984, which will result in a book publication. Finally, member of the technical group also organized the Datenverarbeitung-User meeting of the Max-Planck-Society.

2. Annual Conference

Klein and Perdue organized in cooperation with Slobin the workshop on "Temporality", held June 20 - July 5, 1984. Participants were, for L1 acquisition data: Bamberg, Berman, Bowerman, Clark, Deutsch, Dromi, Edwards, Hickmann, Cassell, Sebastian, Slobin, Weissenborn; for L2 acquisition in children: Anderson; for L2 acquisition in adults: Dittmar, Klein, Noyau, Perdue, Trévise, von Stutterheim; for L1 adult data: Ehrich, Redeker. Three developmental populations were considered - L1 acquisition in childhood, L2 acquisition in childhood, and untutored L2 acquisition in adulthood - along with L1 adult discourse, with materials drawn from naturalistic observation and spontaneous and elicited narratives (picture sequences and films) in a number of languages. A selection from all of these data was compiled and distributed in advance. The workshop was accompanied by three talks on general problems of temporality (Comrie, Romaine, Reinhardt).

A major contribution was the compilation and piloting of a

<u>Coding Manual:</u> <u>Temporality</u> <u>in</u> <u>Discourse</u> (Berman, Slobin, Bamberg, Dromi, Sebastian), designed to allow for comparability along the following dimensions: (1) across subjects (at different ages, children and adults, first- and second-language learners); (2) across languages, including types which differ critically in grammatical marking of tense and aspect; (3) across discourse modes and settings. The manual is intended to provide for the analysis of a variety of issues of temporal expression in extended discourse, applicable to speech transcripts gathered from children and adults across languages. The coding system aims at both isolating and integrating different parameters that are often confounded in analysis of temporality, tense-aspect, or T/M/A systems. Separate coding is provided for: clause-level syntax, verbal morphology, predicate semantics, the location of an event or state on the time line, perspective taken on an event or state; as well as discourse-based relations between clauses or longer units, including: temporal sequencing, relations of foreground-background, and logical contingencies. On the linguistic plane, specification is made of the overt devices used in encoding different parameters of temporality: verb token, time expression (adverbs and conjunctions), modal expression, and lexical items marking aspect.

The workshop devoted special attention to several issues within the overall framework of the development of linguistic expressions of temporality: (1) discourse functions of tense-switching; (2) development of concepts of event segmentation and their reflection in linguistic devices for the demarcation, sequencing, and compression of events; (3) effects of different means for eliciting temporally-oriented discourse on linguistic expressions of temporality and their development; and (4) differences between L1 and L2 developmental patterns. An important aspect of the theoretical discussion and data analysis dealt with refining the notions of "foreground" and "background" in narrative discourse.

3. Teaching

The institute's staff taught courses of varying duration at the following universities: University of California-Irvine (Kean), University of Cologne (Ehrich, Weissenborn), University of Frankfurt (Klein), University of Hamburg (Weissenborn), University of Leiden (Eling), University of Mannheim (Deutsch), University of Melbourne (Richardson), University of Nijmegen (Eling, Vonk, Zwitserlood), University of Oxford (Romaine), University of Southern California-Los Angeles (Hawkins), University of Strasbourg (Wenk).

4. Lectures and Colloquia

The Institute organized a number of colloquia. Papers were presented by the following scholars:
C.B. Benveniste, B. Bichakjian, M. Bierwisch, J. Cassell, H. Clahsen, W. Corsaro, G. Dogil, J. Du Bois, D. Gentner, P. Gordon, K. Hale, Th. Herrmann, C. Hill, E. Holenstein, V. Holmes, J.-M. Hombert, G. Humphreys, V. John-Steiner, A. Karmiloff-Smith, Ch. Lehmann, E. Lieven, D. McNeill, D. Mitchell, D. Parisi, H. Seiler, G. Senft, E.E. Smith, V. Tartter. (This list does not include the lectures in connection with the Universals Project, see 2.4.)
In addition, in the series 'The Nijmegen Lectures' (organized in cooperation with the Interfaculty Unit for Language and Speech of the Catholic University of Nijmegen) S. Pinker of the Massachusetts Institute of Technology gave a one week seminar on "Language Learnability and Language Development", including the following public lectures:
- Language learnability and language development
- The acquisition of phrase structure
- The acquisition of lexical entries and lexical rules
- The acquisition of closed class morphemes
- The acquisition of auxiliaries.
Additional sessions included seminars on "spatial cognition",

"the acquisition of dativization and passivization", and "second language acquisition and aphasia", as well as informal discussion groups.

5. New Building

There has been smooth progress in the construction of the new building for the institute at the University campus. The expected date of moving is November 1985.

6. Scientific Cooperation with the People's Republic of China

With the aid of Professor Liang (Leiden), initial contacts were established with the Linguistic Insitute and the Psychological Insitute of the University of Peking. During a short stay of Klein in Peking, preliminary agreement on two small research projects in first and second language acquisition was reached. A regular exchange between scholars and Ph.D. students is also planned.

7.Conference and Workshop Papers Presented

E.S. Andersen, "The role of visual perception in conversational interaction", Symposium on Communicative Capabilities: Their Development and Application in Varied Contexts. Meeting of the International Communication Association, San Francisco, May.

- "The contribution of sibling/peer input to the language development of blind children", Boston University Conference on Language Development, Boston, October.

- "Siblings' contribution to the interactional competence of blind children", Symposium on the Contribution of Sibling Interaction to Social, Emotional, and Cognitive Development. American Anthropological Association Meetings, Denver, November.

E. Bates, A.D. Friederici, G. Miceli, S. Smith, B. Wulfeck and

Psychological Society, Bergamo, September.

- "Individual differences in the comprehension and production of language", International Conference on Individual Differences in Cognitive Processes, Catania, November.

U.H. Frauenfelder, "On approaches to cross-linguistic processing studies", Seventh European Psycholinguistics Association Workshop, Paris, June.

- "Phonetic decisions and lexical constraints in the real-time processing of speech", Joint meeting Experimental Psychology Society and the Netherlands Psychonomics Foundation, Amsterdam, July.

- "Les effets de fréquence sur la reconnaissance des mots auditifs", Groupe Acoustique de Langue Française (GALF), Paris, November.

A.D. Friederici, "Syntax and semantics in aphasia", 4th European Winter Conference on Brain Research, Courchevel, France, March.

- "Children's sensitivity to function words during sentence comprehension", XXIII. International Congress of Psychology, Acapulco, September.

- "Developing sentence comprehension: Learning how to use structural cues adequately", Ninth Annual Boston University Conference on Language Development, Boston, October.

- "Some remarks on the human language repair system in language understanding", Colloquium Aphasia Research Center, Boston VA Medical Center, October.

- "Processes and strategies in sentence comprehension: Evidence from aphasia", Journal Club de Neurolinguistique et de Neuropsychologie, Centre Hospitalier Côte des Neiges, Montreal, October.

A.D. Friederici and P. Graetz, "Processing passive sentences in aphasia: Deficits and strategies", 7th INS European Conference, Aachen, June.

A.D. Friederici, J. Weissenborn, and M. Kail, "Die Rolle des Inputs beim Verstehen von klitischen und nicht-klitischen

- "Agreement as a research tool", Eastern States Conference on Linguistics, Ohio State University, September.
- W. Deutsch, "Aktuelle Probleme des Spracherwerbs", Kolloquium der Biologisch-Mathematischen Sektion des Psychologischen Instituts der Universität Zürich, Zürich, January.
- "Wie (un-)ähnlich sind Sprachproduktion und Sprachverstehen?", Ringvorlesung Sprachpsychologie zum Gedenken an Hans Hörmann, Bochum, April.
- "Besitz und Eigentum im Spiegel der Sprachpsychologie", Tagung der Deutschen Forschungsgemeinschaft, Universität Heidelberg, July.
- "How (dis-)similar are language production and language comprehension?", XXIII. International Congress of Psychology, Symposium on Cognitive Aspects of Language Production, Acapulco, September.
- "Die Entwicklung von sprachlichen und nicht-sprachlichen Mitteln der Referenz", 34. Kongreß der Deutschen Gesellschaft für Psychologie, Wien, September.
- W. Deutsch, Ch. Koster and J. Koster, "What can we learn from children's errors in understanding anaphora?", 6. Jahrestagung der Deutschen Gesellschaft für Sprachwissenschaft, Bielefeld, February.
- J. Edwards, "Two applications of computers to second language research", Second Language Research Forum, Los Angeles, February.
- P. Eling, "Morfologische aspecten van het lezen bij een patient met deep dyslexia", Minisymposium on Reading, Nijmegen, April.
- "Hersenletsel en taalverlies: Effekten op het spraakproces", 38e Filologencongres, Nijmegen, April.
- G.B. Flores d'Arcais, "Conceptual structure and the mental lexicon", Ringvorlesung Sprachpsychologie zum Gedenken an Hans Hörmann, Bochum, May.
- "The human information processing paradigm in contemporary cognitive psychology", XX. Congress of the Italian

E.B. Zurif, "Cross linguistic studies of sentence processing in aphasia", 22nd Academy of Aphasia, Los Angeles, October.

M. Bergman and P. Eling, "The recognition of morphologically complex words", Joint Meeting Experimental Psychology Society and the Netherlands Psychonomics Foundation, Amsterdam, July.

M. Bowerman, "Beyond communicative adequacy: The role of covert reorganizational processes in first language acquisition", Colloquium, Netherlands Institute for Advanced Study, Wassenaar, February.

-- "Do children's early grammatical categories and rules map onto a semantic base?" 6. Jahrestagung der Deutschen Gesellschaft für Sprachwissenschaft, Bielefeld, February.

- "Children's spontaneous speech errors: Clues to covert conceptual structures and links to universal grammar", Colloquium, Seminar for English Philology, University of Tübingen, December.

E.V. Clark, "Complex compounds and word-order in English", 6. Jahrestagung der Deutschen Gesellschaft für Sprachwissenschaft, Bielefeld, February.

-- "Word-formation in children", Keynote Talk, Child Language Seminar, University of Nottingham, March.

- "Tense and time in the acquisition of French and Spanish", Workshop on Temporality, Max-Planck-Institut, Nijmegen, June.

B. Comrie, "Subject and object control: syntax, semantics, and pragmatics", Tenth Anniversary Meeting, Berkeley Linguistics Society, Berkeley, February.

"Control: syntax, semantics, and pragmatics", Max-Planck-Insitut/NIAS Universals Project Workshop, Wassenaar, Netherlands, May.

- "Tense in indirect speech", Workshop on Temporality, Max-Planck-Institut, Nijmegen, July.

- "Typology of syntactic contrasts in English and Slavic", Universals Project, Max-Planck-Institut, Nijmegen, August.

Pronomen bei Aphasikern: Eine sprachvergleichende Studie",
6. Jahrestagung der Deutschen Gesellschaft für
Sprachwissenschaft, Bielefeld, February.

J. Hawkins and G. Gilligan, "Left-right asymmetries in
morphology and syntax", Symposium on Cross-linguistic
Studies of Morpho-phonological Processing, Maison des
Sciences de l'Homme, Paris, June.

C. Heeschen, A.D. Friederici and E. Drews, "Lexical access in
agrammatism: An inflected language as a testing ground",
22nd Academy of Aphasia, Los Angeles, October.

A.-M. van Hest, M.-L. Kean, and E. Kellerman, "Some transitives
transfer easily", 7th AILA World Congress, Brussels, August.

M. Hickmann, "Metalanguage and object language in child
language", Center for Psychosocial Studies, Workshop on
Metalanguage and Object Language, Chicago, April.

- "Le discours rapporté et la métapragmatique", Laboratoire de
Psychologie Expérimentale, Unité Psycholinguistique
Génétique, Working Group on "Psycholinguistique Pragmatique
de l'Enfant à l'Adulte", Paris, May.

- La cohésion dans le discours de l'enfant", Université de
Rouen, Laboratoire de Psychologie, Research Seminar on Child
Language, Mont-Saint-Aignan, May.

H. Holmback, "Inferring generic reference", Seminar 'Between
Semantics and Pragmatics', Inter-University Center,
Dubrovnik, May.

- "The analysis and interpretation of non-obligatory control
pro", LSA Winter Meeting, Baltimore, October.

A. Karmiloff-Smith, "From metaprocedural operators to
consciousness", European Conference on The Role of Behaviour
in Evolution and Development, Avery College, London, March.

- "Educational significance of concepts of intelligence and
human development", Conference of the United States National
Academy of Education, Lidingö, Sweden, June.

- "Beyond structuralism within a constructivist approach to
modelling linguistic and cognitive development", Symposium

on Constructivism Today, Archives Jean Piaget, Geneva, June.
- "Computation and cognitive development", British Psychological Society Section for History and Philosophy of Psychology, London, December.

M.-L. Kean, "Linguistic anomalies in developmental dyslexia", Orange County Orton Society, Newport Beach, Ca., February.
- "Language and the brain", lecture series, University of Salzburg, June.
- "Modularity and the great chain of being", 7th AILA World Congress, Brussels, August.
- "Anatomical and immunological development in dyslexia", Workshop on Dyslexia, Orton Dyslexia Society, Los Angeles, October.

E. Keenan, "A semantic definition of indefinites", Groningen Round Table on Linguistics, Groningen, June.

H.J. Kempff, W. Vonk, and L.G.M. Noordman, "Inference processes in reading", Joint Meeting Experimental Psychology Society and the Netherlands Psychonomics Foundation, Amsterdam, July.

W. Klein, "The study of complex verbal actions" and "Four problems for the learner", VW-Tagung on Psychology and Language, Schloß Reisenburg, July.

W. Klein and C. Perdue, "Structure thématique de l'énoncé: analyses translinguistiques", Ve Colloque International sur l'Acquisition d'une Langue Etrangère, La Baume-les-Aix, May.

W.J.M. Levelt, "Pointing and voicing in deictic expressions", Symposium 'Taal, Denken, Gebaar', Tilburg, March.
- "Language and space", Ringvorlesung Sprachpsychologie zum Gedenken an Hans Hörmann, Bochum, May.
- "Referent accessibility and how to focus a referent for the addressee", XXIII International Congress of Psychology, Symposium on Cognitive Aspects of Language Production, Acapulco, September.

P. Merjanian, L. Nadel, I. Lott and M.-L. Kean, "Comparative neuropsychology of autism", Society for Neuroscience,

Anaheim, Ca., October.

L.G.M. Noordman, W. Vonk, and H.J. Kempff, "Does knowledge control inference processes?", 26. Tagung experimentell arbeitender Psychologen, Nürnberg, April.

Th. Pechmann, "The relation between nonverbal and verbal behavior: some developmental aspects", Symposium 'Taal, Denken, Gebaar', Tilburg, March.

-   "Erst reden, dank denken? Überlegungen und Befunde zu einer inkrementellen Strategie der Sprachproduktion", 26. Tagung experimentell arbeitender Psychologen, Nürnberg, April.

-   "Children's and adults' strategies of visual information processing and concurrent speech production", Joint Meeting Experimental Psychology Society and the Netherlands Psychonomics Foundation, Amsterdam, July.

-   "Children's and adults' strategies of visual information processing and concurrent speech production", Nederlandse Stichting voor Psychonomie, Werkgemeenschap Funktieontwikke-ling, Utrecht, September.

-   "Erst reden, dank denken? Überlegungen und Befunde zu einer inkrementellen Strategie der Sprachproduktion", 34. Kongreß der Deutschen Gesellschaft für Psychologie, Wien, September.

C. Perdue, "Acquisition d'une deuxième langue par des adultes immigrés: un exemple de co-opération européenne", Colloque de l'APLV, Cerisy, August.

-   "Compréhension, malentendus et échecs de la communication dans les échanges verbaux entre immigrés et autochtones", Colloque sur le Bilinguisme, Neuchâtel, September.

G. Redeker, "Einfluß der Sprechsituation auf die Gestaltung von Beschreibungen", 26. Tagung experimentell arbeitender Psychologen, Nürnberg, April.

-   "Discourse functions of tense-switching in film descriptions", Workshop on Temporality, Max-Planck-Institut, Nijmegen, July.

G. Richardson, "Letter orientation errors in retarded readers: Visuo-spatial or verbal deficiency?", 2nd European Workshop

on Cognitive Neuropsychology, Bressanone, January.

S. Romaine, "Syntactic variation and the acquisition of strategies of relativization in the language of Edinburgh schoolchildren", Social Science Research Council Workshop on Varieties of British English Syntax, Salford, January.

- "Relative clauses in child language, pidgins and creoles", 54th ANZAAS Congress, Australian National University, Canberra, May.

- "The problem of style in socio-historical linguistics"; and "Style, productivity and morphological change in the history of English", Symposium on Change and Variation in Language, Helsinki, June.

- "The expression of temporality in pidgins and creoles", Workshop on Temporality, Max-Planck-Institut, Nijmegen, June-July.

S. Romaine and U. Chana, "Evaluative reactions to Panjabi/English Code-switching", British Association of Applied Linguistics, Bangor, September.

S. Romaine and M. Martin-Jones, "Semilingualism: A half-baked theory of communicative competence", Fjärde nordiska tvåspråkighetssymposiet, Uppsala, June.

D.I. Slobin and A. Talay, "Development of pragmatic uses of subject pronouns in Turkish child language", Second Conference on Turkish Linguistics, Bogaziçi University, Istanbul, August.

S. Sugarman, "Why not development?", invited address to the British Psychological Society, Developmental Section, Lancaster, September.

L.K. Tyler, "Integration of information during language comprehension: A developmental study", 16th Stanford Child Language Research Forum, April.

W. Vonk, "Met het oog op het pronomen: een onderzoek naar pronominale inferenties", Zevende Minisymposium over Lezen, University of Nijmegen, April.

"Comprehension of pronouns", Joint Meeting Experimental

Psychology Society and the Netherlands Psychonomics Foundation, Amsterdam, July.
- "The immediacy of inferences in the understanding of pronouns", Workshop on Inferences in Discourse Processing, Bielefeld, July.
- "Inferences in anaphora resolution", XXIII International Congress of Psychology, Symposium on Eye movements and Psychological Processes, Acapulco, September.
W. Vonk and L. Noordman, "Reader's perspective and encoding of text", 26. Tagung experimentell arbeitender Psychologen, Nürnberg, April.
J. Weissenborn, "La genèse de la référence spatiale en acquisition de la langue maternelle et de la langue seconde: similarités et différences", 7th AILA World Congress, Brussels, August.
- "Von der demonstratio ad oculos zur Deixis am Phantasma", Karl-Bühler-Symposium, Essen, November.
J. Weissenborn, A.D. Friederici and M. Kail, "Die Rolle des Inputs beim Verstehen von klitischen und nicht-klitischen Pronomen bei Kindern: Eine sprachvergleichende Studie", 6. Jahrestagung der Deutschen Gesellschaft für Sprachwissenschaft, Bielefeld, February.
- "Zur Rolle sprachspezifischer Faktoren bei der Verarbeitung von Pronomina: Eine ontgenetische Studie", 34. Kongreß der Deutschen Gesellschaft für Psychologie, Wien, September.
P. Wittenburg, "Messung der Augenbewegungen in Sprachproduktionsexperimenten", DECUS Tagung, Darmstadt, März.
- "Bestimmung der kognitiven Belastung beim Sprechen auf der Basis von Augenbewegungsmessungen", KIP Computer Workshop, Nijmegen, Mai.
- "Data communicatie - nu?", NIP Congress, Ede, December.
P. Wittenburg and I.G. Niemegeers, "Local area computer networks", KIP Computer Workshop, Nijmegen, Mai.
P. Zwitserlood, "Gating Technik zur auditiven Worterkennung", 26. Tagung experimentell arbeitender Psychologen, Nürnberg,

March.

PUBLICATIONS

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