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MAX-PLANCK-INSTITUT FÜR PSYCHOLINGUISTIK

Annual Report Nr. 6
1985

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WITH ASSISTANCE FROM SYLVIA AAL

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PREFACE

This Annual Report is the first issued from the Institute's new headquarters. The building, designed by Kraaijvanger Architects, was completed in November 1985, and occupied by the Institute during December. This has been a period of pleasant chaos, both physical but especially mental. As the chairman of our Scientific Council expressed it: one can move an institute, but not one's habits. A slow process of adaptation to a new environment has begun, but under definitely superior working conditions.

Another highly satisfying and important development during 1985 was the appointment of Dr. Manfred Bierwisch of the Academy of Sciences, Berlin, GDR, as External Member of the Max-Planck-Institute for Psycholinguistics. This will make it possible for Manfred Bierwisch to become intensively involved with our Institute's research in fulfillment of a dear wish on our part. At the same time this appointment will improve the already existing working relations with the Research Group in Cognitive Linguistics of the Academy of Sciences.

The Institute's research during 1985 was marked by continuity and intensification. The Language Universals project was completed, but no new major projects were undertaken during the year. Rather, it was felt that more theoretical progress could be made by concentrating on the existing domains of research. The present report hopefully radiates this approach. But as theoretical questions become more subtle, there is usually an accompanying need for more sophisticated research tools. Research in both first and second language acquisition often requires computer-based analysis of vast amounts of longitudinal data from various languages. Similarly, research on the comprehension and production of speech is increasingly dependent on computerized

lexical databases containing detailed form and frequency information about a language's lexicon. The Institute has become a partner in the establishment of three such computerized databases. First, CHILDES is a multilingual first language acquisition database developed as a cooperative project with Carnegie-Mellon University (cf. 3.1.4.1). Second, the ESF Second Language Acquisition Database is presently being established at the Institute with the help of six European research teams cooperating in the ESF project (cf. 3.2.1). Finally, there is the CELEX project, sponsored by the Dutch Government, and involving various Dutch institutions (see Other Activities). This database will contain lexical form and frequency information for English and Dutch and, it is hoped, eventually also for German. Each of these databases and the software tools required to access them will serve not only members of the Institute but also outside academic users.

Willem J.M. Levelt

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RESEARCH IN PROGRESS

1. LANGUAGE PRODUCTION

A speaker's route from a communicative intention to the articulation of overt speech entails several stages or levels of processing. The speaker selects the information to be conveyed to express the intention, and prepares a preverbal message which will convey this information given the discourse context. At the same time, the preverbal message contains all the conceptual components required for linguistic formulation in the target language. Among them are deictic components that may vary from language to language. The tense system of a language may oblige the speaker to enrich the preverbal message with information about relations between reference time and speaking time, as well as with non-deictic information about relations between reference time and event time. This obligation also holds when none of this information contributes to the realization of the communicative intention. Similar language-dependent requirements exist for the use of spatial deictical terms. Over the last year several studies in reference, deixis, and pragmatics have addressed these issues of intentional and language-dependent preparation of preverbal messages.

The linguistic formulation of the preverbal message involves several stages of its own, including grammatical encoding of the message and phonological planning. Quite central in linguistic formulation are processes of lexical access. Lexical items are activated by conceptual constellations in the preverbal message. An activated item, or lemma, imposes its syntactic restrictions on the ongoing process of grammatical encoding. In this way thematic (conceptual) roles are mapped onto grammatical relations. An activated lemma also primes the corresponding phonological properties, which become an integral part of the phonetic

utterance plan. The time-course of lexical activation, as well as the status of potential morphological and phonological production units have been the subject of various experiments.

Finally, the question was addressed of how a speaker's attentional resources are distributed over these different levels of processing. One would expect that more attentional effort is spent on the higher levels of message generation than on the lower more automatic levels of formulation and articulation. But in order to demonstrate more precisely which processes involve the use of executive resources, techniques must be developed for the on-line measurement of mental effort during speech. Some steps were taken towards developing such a technique.

1.1 Reference and Deixis

1.1.1 Tense and Temporal Deixis

Ehrich continued her work in linguistic semantics. She wrote a review article about the semantics of event expressions comparing the meaning of nominalizations of different form classes (e.g., verbal vs. nominal gerunds) in terms of their meaning. Various recent approaches to formal semantics were reviewed in this article: Barwise & Perry's event semantics, Chierchia's adaptation of Cocchiarella's Fregian Frames, Turner's application of Scott's domains.

Ehrich also continued her studies on temporal semantics. In particular, she investigated the meaning and the use of tense and temporal adverbs in texts. For the temporal interpretation of texts she makes a distinction between the anaphoric and the deictic mode of chaining. Anaphoric chaining is done by the use of anaphoric as opposed to deictic adverbs (eine Woche zuvor 'a week before that' vs. vor einer Woche 'a week ago') or by use of anaphoric as opposed to deictic tenses (Pluperfect vs. Present Perfect) or by a combination of both.

Differences in the mode of chaining may lead to different value assignments in the interpretation of one and the same tense or adverb.

(i) Letzten Donnerstag habe ich Hans besucht. Er ist vor genau einer Woche aus China zurückgekommen

(ii) Letzten Donnerstag habe ich Hans besucht. Er war vor genau einer Woche aus China zurückgekommen

For instance in (i) the adverb vor genau einer Woche is primarily linked to the speaking time, whereas in (ii) the same adverb is linked to the time of my visit with Hans. Hence, according to (ii) Hans must have returned from China on a Thursday, which need not be the case in (i). The acceptability of certain tense/adverb combinations is dependent on the mode of chaining as well. Whereas the combination of Present Tense and gestern is not as such incorrect (Historical Present), they cannot be combined in sequences like (iii) "Nächsten Donnerstag besuche ich Hans. Gestern gehe ich zum Friseur", where the temporal adverb is meant to link not to the speaking time, but to the event time of the preceding sentence. It is, however, not always the case, that a deictic adverb links to the speaking time as its only possible reference point; (iv) is a possible sequence, if the second sentence gets interpreted as 'quoted speech': (iv) "Am Donnerstag wachte Hans früh auf. Gestern hatte er endlich einen Job gefunden".

Ehrich analyzed constraints on tense/adverb combinations using her extension of Reichenbach's threefold temporal schema, which was outlined in the 1984 Annual Report. Her theoretical analysis is also meant to yield hypotheses both about the generation of tensed sentences in the actual speech and about the acquisition of tense and temporal adverbs in first language acquisition.

1.1.2 Language and Space

The effect of visual and vestibular perceptual constraints on the use of deictic terms was investigated in an experiment which was part of the Spacelab Mission D-1. Friederici and Levelt used the experimental setting of micro gravity to study the role of the gravitational field and the resulting perceptual cues for the complex representation of space and for successful communication about space. The correct use of terms like "above" and "below" presupposes the activation of this representational system as well as the corresponding linguistic representation. Levelt has suggested that there are at least three perceptual cues that can be used as reference for correct spatial assignment: the retinal meridian, the visual frame information and the gravitational axis. Experimentation in micro gravity made it possible to vary all three of these factors. Different visual arrays varying systematically the orientation and the axis of two non-oriented objects (balls) and the orientation of the visual frame (trees) were presented to the subjects under different gravitational conditions: in 1-g as well as in micro gravity. In both gravitational settings subjects perceived the visual information when body and head axes were aligned and when the head was tilted to either the left or the right side. The subjects' task was to describe the visual arrays as fast and as accurately as possible. A preliminary qualitative analysis of the descriptions of two payload specialists who served as subjects suggested that in the absence of gravity the retinal coordinates were used as the primary reference whereas in 1-g the gravitational axis was normally used by subjects when standing upright. The latter finding was confirmed by a group of control subjects. Friederici and Levelt concluded that in the absence of gravity the retinal axis is sufficient for the unambiguous use of deictic terms. Possible conflicts between the horizontal axis of the retina and of the frame are solved

by giving more weight to the former information. This process of weighting should be reflected in the subjects' response latencies which are currently under analysis.

1.1.3 Discourse Structuring

The study of discourse has in recent years turned away from the purely semantic consideration of referential and conceptual coherence to include discourse-structural and pragmatic factors. Not only conversations with their by now well-described turn-taking structure, but also monologues contain prosodic and linguistic cues that signal structural boundaries between sub-units such as episodes, background, explanation, evaluation, and so forth.

Linguistic markers of discourse structure can be used (a) at the content level ("referential use") or (b) at the discourse level ("pragmatic use").

(a) He tried to apologize, but it was too late.

She's happy because she met that man.

(b) I guess it's just to place it in time or something, but they have little kids outside.

It's the next day because the note said tomorrow.

Conjunctions and adverbials can be used at either level, while interjections ("okay", "well", "anyway", etc.) and structuring uses of comment clauses ("you know", "I mean", etc.) occur only at the discourse level.

In her analysis of film descriptions, Redeker found that the speaker's choice of "referential" or "pragmatic" structuring depends on situational factors like familiarity and interactional involvement of the addressee. Speakers who were talking to a friend used about four times as many discourse-structuring comment clauses and interjections and almost twice as many "pragmatic" connectives as speakers who were talking to an unfamiliar person. Speakers with unfamiliar addressees, by contrast, began one third of their clauses with

subordinating conjunctions or semantically rich connectives, compared to only one fourth when the listener was a friend.

These differences hold not only in the "dialogue situation", where the speakers who were talking to a friend received more feedback from their listener than those who were talking to a stranger, but also in the "monologue situation", where the listener could not give any feedback at all. The frequencies of interjections and of "referential" uses of connectives did, however, correlate with the amount of listener activity in the dialogues. Discourse-level structuring thus appears to be associated with informal, interactive situations, while more formal settings induce richer elaboration of the semantic structure of the discourse.

1.2 Lexical Access in Production

1.2.1 The Time Course of Lexical Access

During 1985 Levelt and Schriefers conducted the first two of a series of experiments which aim at testing the dual access theory (see previous annual report). According to this theory lexical access in production involves two major stages. In a first stage conceptual information (derived, for example, from the picture of a to-be-named object) is used to access the relevant lemma from a set of activated lemmas. These lemmas are assumed to be specified with respect to their semantic and syntactic properties, but not with respect to their sound form. In the second stage, the selected lemma activates its corresponding sound form.

If these theoretical assumptions are correct one should be able to find an early moment during lexical access where there is only activation of semantic (and syntactic) information, but no activation of the corresponding sound form. At some later moment, in contrast, one should, under a strong version of the theory, find only sound form activation, but no longer any

semantic activation.

In preliminary experiments by Levelt and Pechmann pictures of common objects were selected such that they fulfilled the following criteria: (i) native speakers of Dutch agreed on the verbal label to be given to these objects, (ii) the time needed to recognize the object was short, and (iii) the time needed to name the object was relatively long as compared to its recognition time.

In the main experiments subjects had to name objects whose pictures were presented one by one. In addition, on the experimental trials subjects heard a word or a nonword after the onset of the visual display. Subjects who were then in the process of accessing the object name had to make a lexical decision on this auditorily presented test item, i.e. they had to press a "yes"-button when it was a word and a "no"-button when it was a nonword. Each test word had four relations to the object to-be-named: identical (e.g. picture: table, word heard: "table"), semantically related (e.g. picture: table, word heard: "chair"), phonetically related (e.g. picture: table, word heard: "taylor"), or unrelated (e.g. picture: table, word heard: "dog"). The corrected dependent variable was the difference between these lexical decision latencies and lexical decision latencies for the identical test words presented without pictures to the same subjects one week before the main experiment.

Against the background of the dual access theory, the crucial parameter in the main experiments was the temporal interval between the onset of the slide and the auditory presentation of the test word for lexical decision. In a first experiment a relatively long delay was chosen (500 msec. on average), so that the presentation of the test word could be expected to fall in the second stage, that of sound form activation. Indeed, this first experiment led to significantly longer lexical decision latencies in the phonetically related condition than in the semantically related and the unrelated

conditions. The latter two showed virtually the same latencies suggesting that there is no specific semantic effect at this stage. Lexical decision latencies in the identical condition were shorter than those in the unrelated and the semantically related condition.

In a second experiment, a shorter delay was chosen (300 msec. on average) in order to attempt to present the test word in the stage of lemma access. However, even with this shorter delay the lexical decision latencies revealed a pattern very similar to the one found in the first experiment, except that the lexical decision latencies for the identical condition were the same as those for the unrelated and the semantically related conditions. So in a third experiment, in progress, a still shorter delay is used to see whether it is possible to find evidence for a stage early in lexical access at which there is only lemma activation. In addition, Schriefers and Levelt are presently addressing the same theoretical issues with a different experimental paradigm which should make it possible to trace the time-course of lemma and sound form activation within a single experiment.

Meyer started a related project investigating how speakers access sound forms in word production. Speech errors in which phonemes or groups of phonemes smaller than morphemes are misordered have been taken to suggest that units smaller than morphemes are retrieved and combined in sound form planning. The project attempts to determine what these units are - whether they correspond to syllables, syllables constituents or phonemes, or whether several different types of units are involved.

Several pilot studies have been run to develop a suitable experimental procedure. A priming paradigm in which subjects name pictures of objects as quickly as possible was chosen. Before seeing each picture subjects hear a nonword prime that is either phonetically related or unrelated to the picture

name. The related primes overlap with the respective targets in form to differing degrees: in an entire syllable, a syllable constituent or a phoneme. It is expected that the relative effectiveness of the different types of primes will provide information about which strings serve as planning units.

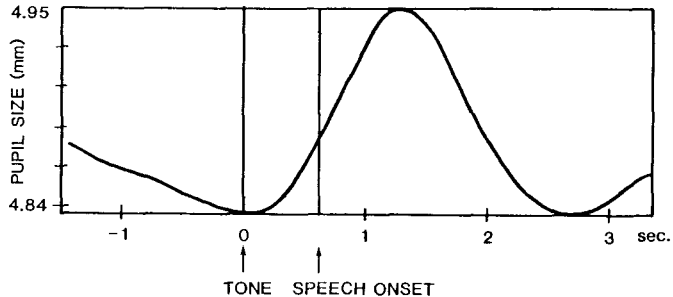
1.2.2 Morphology in Speech Production

Eling continued his investigation of the role of morphological structure in production. As reported in the last Annual Report he did not find an effect of morphological complexity in word production tasks. No differences in speech onset latencies were obtained for singular, plural and diminutive forms of nouns. The absence of an effect of morphology was confirmed in two further experiments in which subjects were asked to produce comparative forms. These results confirm Cutler's thesis that, though complex morphology may be "psychologically real", complex lexical entries are not harder to retrieve than simple entries.

1.3 Mental Effort in Speech Production

Levelt, van Oeffelen, Spenner and Terken have been developing a continuous measure of mental load or attentional effort during speech production. The speaker's fluctuating pupil diameter during speech appears to constitute a promising measure. It is widely accepted that pupil size increases with mental effort, though with a rather substantial delay of about 1 to 1.5 seconds. In the beginning of 1985 van Oeffelen developed and refined a technique to measure the magnitude of a subject's pupil diameter during his performance on a cognitive task. The pupillometric technique was then tested using several standard tasks. One was a reaction-time task like

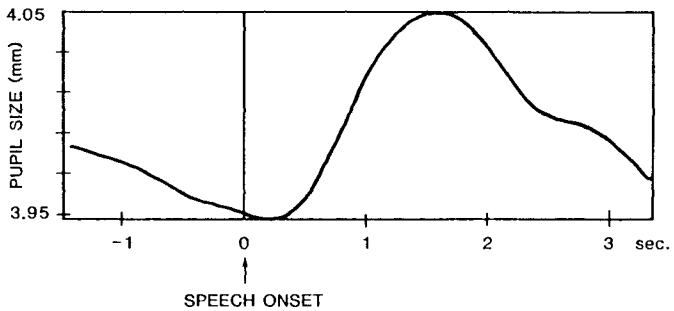
Donders' paradigm in which subjects had to respond as quickly as possible when they heard a particular tone. As an illustration, Figure 1 shows a mean pupillary response for subjects giving the spoken response 'high' (or 'low') when they heard a high (or low) tone (Donders' C-reaction).



The pupillary response typically shows a dilation after tone-onset, which reaches a maximum at about 1300 msec. Thereafter the pupil contracts to its normal size. The amount of dilation partly reflects the amount of cognitive effort. In general, the results of the pupillometric analyses of the tasks suggest that pupil diameter is indeed a valid indicator of mental load.

The sensitivity of pupil diameter to cognitive load makes it a potentially useful tool to track mental load during speech production. Several experiments were conducted with subjects who spoke freely for 1 minute about diverse topics while fixating a small spot. During each one-minute run pupillary data were stored on disk every 20 msec and speech was recorded on tape. The analysis of the pupillary data first involved smoothing procedures and the removal of eye blinks to clean up the raw data. The recorded speech was submitted to a speech editing procedure yielding the position in time of the beginning of each word and of each pause. Next, the pupillary

record was inspected for recurrent temporal relations to events in the speech record, such as beginnings of sentences, or ends of clauses. As an example, Figure 2 shows, averaged over all silent pauses in the 10 one-minute speech runs of three subjects, the change in pupil diameter around the transition from pauses to speech.



Several linguistic features of the speech records are now being examined for systematic relations to the pupillary trace.

1.4 Other Research

While visiting the Institute, MacKay completed a book entitled The Organization of Perception and Action: Fundamentals of Theoretical Psychology. The book deals with the relationship between perception and action in general, and the perception and production of speech in particular. General topics of the book include: the units for speech perception and production, the structure of the interconnections between these units, sequencing and timing in speech perception and production, the effects of perceptual feedback, the nature of error correction, and historical perspectives on the role of theory in psychology.

The book argues that some of the units for production are identical to the units for perception, and develops a theory of how these perception-production units are activated in the proper sequence, and at the chosen rate. The theory is shown to explain a wide range of classical perceptual phenomena, as well as a number of phenomena that are asymmetric between perception and production. The theory is also shown to explain recent findings on the role of perceptual feedback in detecting and correcting self-produced errors, and the disruptive effects on speech production of auditory feedback which is amplified, and delayed by about 0.2 sec.

2. LANGUAGE COMPREHENSION

This year saw the emergence of the Language Comprehension Group as a fully established research unit, under the direction of Marslen-Wilson, who returned to Nijmegen in January. The Comprehension Group also saw the arrival in 1985 of two other new staff members. These were Bayer, who joined the group from Aachen in October, and Lahiri who came from Santa Cruz in December. In addition, Reetz was appointed in November to work with the Technical Group on the development of a multi-user speech laboratory.

The planned development of the Comprehension Group's research program centers around three major themes. The first, and currently most dominant of these, can be characterised as the study of lexical representations and processes. How is sensory information -- whether visual or auditory -- projected onto the representation of word-forms in the mental lexicon? What is the nature of the decision processes that operate on these inputs during the recognition process, and what are the semantic and morphological properties of the lexical representations involved? How are the semantic and syntactic attributes associated with different word-forms deployed in the construction of higher-level representations, and what consequences does this have for the recognition process itself?

These types of questions are already under active investigation within the group, as is amply demonstrated in the research summaries that follow. Much of this lexical research involves spoken language, and this in turn necessitates the use of computer-based methods for speech editing, analysis, and manipulation. The current development by the group of a multi-user speech laboratory, based on a dedicated VAX-750, will greatly facilitate this research, as well as offering

increased facilities for researchers throughout the Institute.

Equally important aspects of language comprehension are the processes of psychological parsing, and the mapping of utterances onto discourse interpretations, which represent the other two major themes of the group's current and planned research. The problem of parsing -- of how the structural properties of utterances are derived during comprehension -- is being pursued from both a linguistic and psycholinguistic perspective, and with a special emphasis on cross-linguistic comparisons. The linguistic environment of the Institute, suspended between Dutch, German, and English, is especially favourable for this kind of research. For the third area, discourse processes, the current emphasis is on the processing consequences of text structure, and on the discourse conditions that determine the use of different types of referential devices.

2.1 Lexical Processing

2.1.1 Time-Course of Word Recognition

The time-course of spoken word recognition has been a focus of the Comprehension Group over the last years. Research has dealt with the role in processing of several factors which appear to be decisive in determining the moment that any given word can be recognized. These include the nature of the representation(s) computed from the sensory input, the structure and distribution of the lexical entries onto which this representation is mapped, the properties of the mapping process itself, and finally the contribution of higher order context.

Frauenfelder and Marcus (IPO) analyzed a 20,000 word computerized phonetic dictionary of English to examine the constraints placed on word recognition by the structure and

distribution of lexical entries. They were particularly interested in studying the relationship of the recognition point of a word to its uniqueness point the recognition point corresponds to the actual moment that a word can be recognized on the basis of the acoustic input. The uniqueness point is defined as the moment that a word becomes unique with respect to the other words in the lexicon on the basis of a sequential phoneme by phoneme analysis. The uniqueness point has proven to be a good predictor of the recognition point and word recognition performance in general, despite the fact that some of the assumptions underlying this notion have been shown to be questionable. In particular, it is doubtful that listeners can, as the uniqueness point assumes, consistently make phonetic decisions correctly, sequentially and categorically given the noisy and unreliable character of fluent speech.

To explain this apparent paradox, Frauenfelder and Marcus have proposed minimal deviation as an alternative construct to represent the extent of mismatch between any given word and the closest non-identical word in the lexicon. In their analysis of the phonetic dictionary, they found that minimum deviation increases constantly with sensory input subsequent to the uniqueness point. This suggests that the empirical success of the uniqueness point as an indicator of word recognition may be accounted for by this subsequent increase in deviation in addition to the single mismatch found at the uniqueness point. Further experiments comparing the listener's recognition performance on words which deviate to greater or lesser extents subsequent to the uniqueness point are planned to evaluate the role of deviation in defining the time-course of word recognition.

Marslen-Wilson, Tyler, and Brown, in research also supported by a program grant from the British Medical Research Council to Tyler and Marslen-Wilson, have been looking at competitor effects in spoken word recognition, and their

relationship to the effects of word frequency. Recent restatements of the cohort model assign word frequency a role in the early activation of word candidates. This in turn leads to certain predictions about the consequences for the recognition of a given word of the relative frequency of its fellow competitors and cohort members. Auditory lexical decision experiments, comparing matched low frequency words with and without higher frequency competitors, show that response times are faster to words that have only low frequency competitors. Research now in progress is looking at the effects on high frequency words of high and low frequency competitors.

Marslen-Wilson, Zwitserlood, and van Halen, in collaboration with other members of the comprehension group, have started to investigate the effects of overlapping activation patterns in lexical access. In earlier research they were able to show that, during the process of auditory word recognition, the early part of a word activated multiple word candidates. Thus, for example, the initial sequence "capt" would equally strongly activate the word "captive" and the word "captain". This was established using a cross-modal priming task, in which listeners were presented with visual probes as they heard the /t/ of "capt".

The new research looks at the effect of overlap for pairs of words like "cattle" and "battle", which overlap at least as much as the "captain"/"captive" pairs, but where the words do not share their initial phonemes. To the extent that the ordering of the overlap is not critical, the "attle" sequence in "cattle" should activate words like "battle" as strongly as the "capt" sequence from "captain" also activates words like "captive". The experiment also included a further non-word case -- for example, sequences like "jattle". Each of these stimuli was presented auditorily (to different subjects), and was immediately followed by a visual probe that was

associatively related to one of the original rhyming pair -- for example, for the "battle/cattle/jattle" set, the probe could be the word "war". The subjects' task was to make a lexical decision to the visual probe.

There was a strong facilitation of a probe like "war" when it followed "battle", but no facilitation when it followed "cattle" or "jattle". This means that although the input "attle" is common to all three stimuli, this was only able to significantly activate the representations for "battle" when preceded by the correct initial phoneme. This is in contrast to the effectiveness of partially overlapping stimuli like "capt". Such a result is consistent with models of spoken word-recognition, like the cohort model, which emphasize the processing importance of the beginnings of words. The failure of "cattle" -- and, in particular, of the non-word "jattle" -- to activate "battle" is problematic for implementations of the interactive activation model (such as Elman & McClelland's TRACE) which place less emphasis on the ordering of overlapping inputs.

Frauenfelder, continued his investigation of the contribution of the lexical level to phonetic processing. Together with Segui (CNRS, Paris), he has distinguished between two types of interaction (primary and secondary) depending upon how and when information from the lexical level affects processing at the acoustic-phonetic level. when lexical information affects bottom-up phonetic processing before a single lexical candidate has been accessed then there is primary interaction. In contrast, when the lexical level exerts its effect after a single lexical entry has been accessed, there is only secondary interaction. Frauenfelder and Segui have conducted several experiments which aimed at evaluating the interaction between these levels. In one experiment, the position of the phoneme target (e.g. /p/) and the lexical status (word/nonword) of the target bearing item

were manipulated. Phoneme targets appeared in one of four positions in the words: at the beginning of the word, before the uniqueness point, after the uniqueness point, and at the end of the word. The contribution of the lexical level to the phoneme detection process was reflected by the difference in detection times to phonemes in the word and nonwords. The nonwords used were derived from these words while maintaining the target's local environment identical. The results revealed no RT differences in the first two positions but strong lexical facilitation (150 msec differences) for the later two positions. These results suggest that the lexicon contributes to phoneme detection responses only after lexical access in the form of a secondary interaction.

2.1.2 Semantic Activation During Lexical Access

During the year Flores d'Arcais, together with Schreuder, De Vries, and Glazenborg, pursued a project on semantic activation during word recognition and object naming. In a series of experiments they have tried to obtain evidence for a distinction between two components of semantic information which become available when a word or an object is recognized. As in a previous series of experiments, they have been able to isolate the contribution of the two different components in the process underlying object naming, namely a component of perceptually-based semantic information, and a more abstract, functional one. The results of the experiments on the naming of objects have provided a convincing alternative explanation for some of the classic effects in object and word categorization studies.

2.1.3 Morphological Structure and Lexical Access

Earlier research by Tyler (Annual Report 1981/1982) had used the gating task to evaluate the effects of syntactic and semantic sentential context on the timing of word-recognition processes. This research found only very weak effects of syntactic constraints and much stronger effects of semantic constraints. In a new gating study, Tyler and Marslen-Wilson re-examined this finding, looking at the effects of different types of contextual constraints on the processing of multimorphemic inflected words. For stimuli of this type -- as opposed to the uninflected monosyllabic words studied in the earlier experiments -- clear but localised effects of syntax can be observed. Semantic constraints only affected the identification of the base (or root) morpheme, with this morpheme being identified earlier or later depending on the degree of semantic constraint. Syntactic constraints, in contrast, affected the identification of the full affixed form, but did not change the identification-point for the base. These results suggest that words may not be processed as monolithic units, but rather as collocations of different types of information, each of which can interact with different aspects of the language comprehension process.

In collaboration with Burani and Laudanna (CNR, Rome), Frauenfelder investigated the role of morphological structure in the accessing of spoken words using lexical and nonword decision tasks. The objective of these experiments was to establish whether a lexical interference effect (slower nonword decisions when the initial part of the nonword is a word) could be obtained for bound stems as well as for whole words. The analysis of these results (now in progress) should reveal whether there are stem interference effects. The existence of such effects would provide strong evidence for morphological segmentation.

2.1.4 Processing Differences Across Form Class

Flores d'Arcais continued his research into the role of meaningfulness in lexical access. As briefly reported in the 1983 Annual Report, he has collected some evidence suggesting that the difference in processing between open and closed class was not only due to grammatical class but also due to differences in semantic richness. Further results which reflect the role of meaningfulness (independently of form class) have been obtained.

Friederici, Graetz and Schriefers also asked the question of how open and closed class elements are processed during lexical access. They are pursuing earlier studies (Friederici and Heeschen, 1983 Annual Report) which suggested that inflected open class words are decomposed during word recognition whereas closed class words are not. The experiments now in progress use a priming technique to investigate this claim with both stems and inflections serving as primes. A second experiment by Graetz, Schriefers and Friederici is investigating whether inflectional and derivational morphology are processed differently. Under the hypothesis that it is the type of information an item carries (lexical versus syntactic) rather than its morphological status as a bound morpheme, they should be treated differently during word recognition.

2.1.5 Processing Differences Across Modalities

In collaboration with Schreuder (IWTS), Dijkstra and Frauenfelder started an investigation with the objective of determining the stage(s) of processing at which auditory and visual word recognition processes converge. A first experiment involving cross-modal form priming revealed that the auditory processing of a syllable (e.g., pa) was facilitated by the prior presentation of a related visual letter prime (e.g., p).

Further experimental research in progress is attempting to determine the precise locus of these inter-modal effects (i.e. in terms of common representations or decision processes).

2.1.6 Formal and Computational Approaches

During his stay Dogil completed a paper "CV parsing", addressing the question of which properties of the acoustic input are preferentially processed when a string of words is recognized. His claim is that only unmarked, 'pivotal', and hierarchically organized parts of the string have to be processed on the first parse through the signal. Dogil prepared a sample demonstration tape of stimuli using the SPED waveform editor which provided initial support for his claims. Further, more sophisticated experiments are planned - also in cooperation with the Comprehension Group.

Whilst visiting the Institute, Altmann worked on a theoretical paper which considers models of speech perception from a computational and empirical perspective. Several models of speech processing require the rapid integration of many different kinds of knowledge during the processing of speech. Few of these specify to the level of detail required of a computational model the manner in which these different information sources are actually brought together. A model is developed which attempts to do this. It specifies how hypotheses are constructed through time, and through levels of description. The model is based on a computational framework which resembles an active CHART parser, and which allows for information both to the left and to the right of a stretch of speech to influence the interpretation of that stretch. The model makes some interesting claims with regard to the role of stress during speech perception.

2.2 Syntax and Parsing

2.2.1 Processing of Particles

Bayer continued to work on two experiments that were carried out in his previous research unit in Aachen. Both experiments study the processing of German particles like schon, noch, auch etc. which may, depending on the context, adopt either a semantic or a pragmatic (modal) reading. The processing of these different readings was investigated with respect to the functional organization of the two cerebral hemispheres. One experiment was an off-line study of brain-damaged subjects; the other one was an on-line study of normal subjects. These experiments pointed to a model in which the semantic processing of these words is handled by the left hemisphere, while pragmatic processing does not seem to be hemisphere-specific.

In connection with his neurolinguistic experimentation on the processing of German particles, Bayer worked on the syntax of German scalar particles. The problem in this neglected area is that particles like nur, auch, sogar etc. (as part of Fregean compositional semantics) may appear as co-constituents of other syntactic phrases as well as in "remote" position, e.g.

- (i) Nur Hans hat die Schlüssel vergessen/ ...weil nur Hans die Schlüssel vergessen hat
- (ii) Hans hat die Schlüssel nur vergessen/ ...weil Hans die Schlüssel nur vergessen hat

The problem here is to explain how the two alternatives can lead to the same core semantic structure without appealing to a transformational solution, which fails for independent reasons. Bayer suggested that scalar particles in remote positions should be analyzed as anaphors in the framework of Government and Binding Grammar. If they are anaphors without a thematic role, the possibility of core synonymy between (i) and (ii)

falls out as a natural consequence. It was shown that certain alternatives to this view (like an existing treatment in Montague Grammar) have serious problems in explaining the learnability of the V-second constraint in German.

2.2.2 Minimal Attachment and Displaced Constituents

During her stay at the Institute, Frazier explored the syntactic processing of Dutch. In a self-placed reading study, the predictions of Minimal Attachment (a strategy which has been argued to govern the processing of English) were confirmed in sentences like (1).

- (1) Piet kuste Marie en haar zusje ...
- a. Piet kuste Marie en haar zusje ook.
(Ambiguous-Minimal Attachment)
Peter kissed Mary and her sister too.
 - b. Piet kuste Marie en haar zusje lachte.
(Ambiguous-Nonminimal Attachment)
Peter kissed Mary and her sister laughed.
 - c. Marie zag haar zusje ook.
(Unambiguous-Minimal Attachment)
Mary saw her sister too.
 - d. Marie zag dat haar zusje lachte.
(Unambiguous-Nonminimal Attachment)
Mary saw that her sister laughed.

The ambiguous noun phrase "haar zusje" is predicted to be initially analyzed as a constituent of a conjoined noun phrase, not a constituent of a conjoined clause. Hence, (1a) should confirm this initial syntactic analysis. In (1b), however, the remainder of the sentence is incompatible with this analysis and thus should result in time-consuming revision of the initially assigned analysis. Thus, the difference in complexity between (1b) and its unambiguous counterpart (1d) was predicted to be greater than the difference between the Minimal Attachment form (1a) and its unambiguous counterpart

(1c). Experimental confirmation of these predictions suggested that the same processing strategies are operative in the constituent structure processing of Dutch and English.

This study also examined the processing of sentences with displaced constituents (e.g., the relation between the head of a relative clause and the corresponding "gap" inside the relative clause). In sentences like those in (2), it is only the number-marking on the embedded verb which disambiguates the grammatical role of the head of the relative.

(2) a. Ik schreef de vriend die e_i mijn tantes heeft bezocht. (Subject relative)

I wrote to the friend who visited my aunts.

b. Ik schreef de vrienden die mijn tante e_i heeft bezocht. (Object relative)

I wrote to the friends who(m) my aunt visited.

Reading times for the object relative clauses (e.g., (2b)) tended to be longer than reading times for subject relatives (e.g., (2a)). Further, 74% of the answers to questions about ambiguous relative clauses indicated that subjects prefer to assign the head of the relative as the subject (not the direct object) of the relative. This pattern of results supports the existence of a gap-identification mechanism which preferentially relates a displaced constituent to the leftmost noun phrase gap in the immediately following clause. This pattern of results argues against the view that the analysis of head-final constructions is delayed until the head of the phrase has been encountered and processed.

2.2.3 Left/Right Asymmetries in Syntax

Hawkins completed a research paper ("On explaining some left-right asymmetries in syntactic and morphological universals") which attempts to factor out the respective roles of grammatical and processing principles in explaining a class of cross-linguistic regularities in which the two principles

seem to be in partial conflict. These regularities involve left-right asymmetries in syntax and morphology. For example, across languages there is an asymmetry in the distribution of relative clause orders: the languages that are independently predicted by grammatical principles to have the relative clause after the head noun (i.e. head-initial languages such as English) do so; the languages that are independently predicted to have the relative clause before the head noun may or may not do so, and in a significant number of cases have postnominal relatives just as in English. The result is a rightward skewing in favour of postnominal relatives overall. It is argued that there are various processing considerations that make the postnominal order preferable to the prenominal order in real-time language use. These processing considerations and the independent grammatical predictions for postnominal relatives in head-initial languages are consistent with the 100% postnominal positioning for relative clauses in languages of this type. But the processing facts are opposed to the grammatically predicted prenominal order in head-final languages, and this opposition may help explain the existence of both prenominal and postnominal relatives in these languages. The cross-linguistic distribution of grammatical phenomena in this as well as other areas enables us to both identify a partial conflict between the processor and the grammar and to better understand what the precise processing and grammatical principles are.

2.2.4 Interpretation of Pronouns

During his visit to the Institute, Dahl studied the interpretation of 'bound pronouns', i.e. pronouns in natural language that seem to be analogous to bound variables in logic. Earlier research has indicated some problem with the bound-variable approach to bound pronouns. These include 'sloppy identity' (John loves his wife, and so does Harry),

'relational readings' of questions (Which of his relatives does every Englishman admire most?) and other cases of 'second order' readings (His mother is the only woman whom every Englishman admires). Dahl's work concentrated on the construction of a computer program which would simulate the process of assigning reference to pronouns and which could also handle the problematic cases without making use of bound variables. The idea was that when a bound pronoun is interpreted, not only the identity of the referent of the pronoun but also the place of the antecedent (relative to the pronoun) is stored. The latter - the 'antecedent location function' - is then an integral part of the 'meaning' of a pronoun, which can later on be retrieved and, if necessary, quantified over. The program was first developed in LISP on an 8-bit computer, and it had separate syntactic and semantic analysers. After returning to Stockholm, Dahl has concentrated on restructuring the program in such a way as to integrate the syntactic and semantic analysis.

2.3 Text Processing

In research on the expression and function of contrast relations in written discourse (in collaboration with Spooren and Jaspers, University of Nijmegen, and Noordman, K.H. Tilburg), Vonk investigated the impact of the connectives but and and on the interpretation and processing of arguments. The linguistic material consisted of a question of a speaker A, a sentence with two arguments connected with and or with but of a speaker B, and three possible answers (yes, no and don't know) from which the subject had to choose the most appropriate one given the preceding context. The arguments were intrinsically positive, negative or neutral with respect to the question. It appeared that the answer subjects selected was determined by the polarity of the arguments, the order of

occurrence in the sentence, and the kind of connectives. Moreover, when subjects after the experiment had to make another decision on the basis of the single arguments, their interpretation of the neutral argument was influenced by the context. The direction and the strength of the argumentative force of the neutral arguments was perfectly predicted by the kind of connectives and the order of occurrence in the texts they had read before.

In research on the selective processing of texts Vonk investigated whether aspects of the structure of a text affected not only selective retrieval (cf. levels effect in recall), but also selective reading. The structure was specified as a hierarchical tree structure, in which labeled connections between idea nodes consisted of rhetorical relations. Two target paragraphs were incorporated in the texts on a fairly high and a fairly low level in the structure, respectively, or on a fairly low and a fairly high level, respectively. The high paragraph could precede or follow the low paragraph in the text. Subjects were asked to read the text and to perform on an unexpected recognition test. The reading times for the high level experimental sentences were longer than the reading times for the lower level sentences, and the high level sentences were also recognized better than the lower level sentences. Consequently, the content structure of a text appears to affect the encoding of the text.

Other research by Vonk dealt with the effect of the discourse structure on the production of referring expressions. Analysis of several newspaper articles with respect to the use of definite descriptions (proper names, noun phrases) and pronouns in person descriptions indicated that even when no confusion was possible with respect to the intended referent, a definite description was frequently used instead of the pronoun, particularly in sentences in which a "change of topic" is expressed. The contextual constraints on the use of pronouns vs. definite descriptions were investigated in some

production experiments.

Subjects were asked to complete a small discourse fragment. After the production of one or two sentences, a word (either a definite description, a pronoun, a predicate that fitted the discourse fragment, or a predicate that did not easily fit the fragment) was presented as a cue for the completion. As predicted, there was a strong tendency for sentences with the definite description cue to introduce a new topic instead of continuing the same topic. (The reverse was true for sentences with a pronoun.) In completions with a predicate that continued the previous topic, there was a strong tendency to produce a pronoun and not a definite description. One finding was not predicted. In the subjects' completions on predicates that were supposed not to easily fit the discourse fragment, the number of produced pronouns was greater than the number of definite descriptions. However, an analysis of the completions showed that many of these continuations appeared to pursue the same topic.

Conclusions with respect to the contextual constraints in the use of pronouns vs. definite descriptions were confirmed in a subsequent experiment in which subjects were asked to describe what happened in a series of pictures. This series of pictures was about one person, and had two versions: with a single topic or with two topics. The number of definite descriptions was twice as large for the first sentence describing the picture that changed the topic than for the first sentence for the picture that did not change the topic.

2.4 Other Research

Meßing prepared an experiment to investigate processing units in eye movements during the reading of texts. This experiment should clarify some temporal characteristics of the reading processes by separating general scanning routines from

local or immediate cognitive control.

Since arriving at the Institute, Günther has concentrated on completing a book on the structure and processing of written language. The linguistic topics developed in the book include: the relationship between spoken and written language, the historical development of writing, a survey of the world's writing systems, and finally an in-depth analysis of the German writing system. The processing issues that were discussed include: the study of eye-movements and reading, phonological recoding, visual word recognition and models of reading. A final chapter deals with the interaction between the linguistic structure and processing of written language.

3. LANGUAGE ACQUISITION

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

During 1985, studies in first language acquisition have focussed on the relation between children's representation of basic concepts like space, time, motion, possession, and the acquisition of the linguistic devices to express these concepts. The reported studies share one common feature, the systematic reliance on developmental data from children acquiring different languages. Cross-linguistic comparisons are used to specify how certain properties of target languages may determine the linkage between conceptual structures and linguistic processes in development.

Over the past year the studies in the area of second language acquisition have concentrated on the completion of the data collection and the initiation of analyses within the ESF project "Second Language Acquisition by Adult Immigrants". First results are reported for the research area of utterance structure.

3.1 First Language Acquisition

3.1.1 Development of Spatial Reference

Bowerman, together with Gentner (University of Illinois), has begun a cross-linguistic project on the relationship between conceptual and semantic development in first language acquisition, with initial emphasis on spatial terms. Most current work in psychology and computational linguistics implicitly assumes that semantics can be equated with conceptual structure and that word meanings are simply names for concepts. Bowerman and Gentner argue that in many semantic

domains this approach is deeply wrong. In previous work Bowerman has demonstrated that the child learning word meanings is learning a linguistic system, not merely a set of names for concepts, and Gentner has proposed that relational words, such as verbs and prepositions, have a more linguistically defined semantic connection to their referents than nominal terms. Their joint research attempts to specify the role of the semantic categorization system displayed in the linguistic input to the learner in children's acquisition and use of words and grammatical morphemes.

One ongoing study investigates children's learning of locative markers. The acquisition of in, on, under, etc. has been the subject of much research over the last decade. In general, the course of acquisition appears quite uniform both within and across languages, which has led many researchers to assume that the timing of onset and the pattern of use of locatives reflect cognitive development quite directly. However, Bowerman and Gentner point out that our understanding of the role of prior cognitive development is still limited because previous research has concentrated only on children's ability to use or comprehend locatives in connection with prototypical instances of the spatial relations they encode (e.g., on for objects supported by a horizontal surface), which may often be similar across languages. But children must learn how to use locatives not only for prototypical instances but also for entire categories of spatial relations. These categories differ significantly across languages in the nature and organization of the attributes of spatial configurations that speakers must take into consideration if they are to select correctly among the locative markers their language offers. For example, relations of contact and support that English encodes indiscriminately with on (cup on table, picture on wall, apple on tree, raindrops on window, ring on finger) are divided by Dutch into categories encoded by op, aan, and om

on the basis of whether there is horizontal support, attachment, or encirclement, and, in the case of attachment, its exact nature. Auf, an, and um in German correspond roughly to Dutch op, aan, and om, but the associated semantic categories differ somewhat: e.g., attachment is less important than whether the supporting surface is horizontal or vertical.

To the extent that languages differ, solutions to the acquisition puzzles posed by semantic categorization cannot be provided directly by autonomous growth in children's sensorimotor understanding of the world. Rather, they must be worked out through observation of the use of contrasting forms in adult speech. Bowerman and Gentner are investigating how nonlinguistic cognitive development and language-specific experience interact to produce an understanding of the locative categories of the input language. English-, Dutch-, and German-speaking children ages 2 to 6 encode spatial relations in an elicitation task in which they are asked questions and encouraged to talk about the location of objects in a standard doll-house. The German pilot study is being conducted by Taylor (Free University of Berlin). Multiple instances, both prototypical and nonprototypical, of the spatial relations encoded by particular prepositions are included.

Among other analyses, responses will be compared to determine how similar children's initial categorization schemes are across languages. Strong similarity would support existing claims about the primacy of nonlinguistic cognitive growth in the initial development of locatives. However, it is anticipated that responses will to some extent reflect language-specific methods of categorizing spatial relations from the earliest stages of acquisition. This outcome would be theoretically important, since evidence for initial sensitivity to the semantic categories of the input language would force reexamination of the prevalent assumption that children proceed at first by simply mapping locative forms onto concepts provided directly by nonlinguistic cognitive development.

Weissenborn and Friederici, in an extension of a previous study with adults (cf. Annual Report 1984), investigated children's comprehension of deictic spatial prepositions in German ('hinter', 'vor', 'neben'). Two groups of children (5-7 and 10-12 years) 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.

The first two objects mentioned were part of a miniature landscape placed in front of the subject. The second two objects were to be placed by the subject according to his/her interpretation of the description. The following linguistic factors were varied:

- (a) nature of verb in second sentence (static/dynamic)
- (b) localizing expression in the third sentence (pronominal adverb, preposition + pronoun, preposition + noun phrase).

The following perceptual factors were varied:

- (c) nature of second reference object (oriented/non-oriented)
- (d) position of an oriented object with respect to first object and to a street (same orientation as the first object, opposite orientation, orientation towards the street).
- (e) orientation of the subject with respect to the spatial display (sitting behind or facing the first reference object).

The results revealed that the linguistic factor, 'verb type' (static vs. dynamic), which was the critical parameter for the interpretation of prepositions by adults, played no significant role in the performance of the children of both age groups. Instead, children relied heavily on perceptual factors. In the younger age group the intrinsic interpretation of the preposition was preferred, unlike the older children who predominantly chose a deictic interpretation. These findings suggest the existence of a hierarchy of reference frames for the interpretation of prepositions: object based, self based

and linguistically based. This is consistent with the view that the development of problem solving strategies proceeds from those based on local perceptual cues to those based on more general reference systems. Reference systems introduced by verbal means (e.g. on the basis of the verb) are apparently the least accessible to young children.

Friederici, Weissenborn and Lewandowski repeated the same study with children having vestibular and auditory disorders to pinpoint the role of vestibular perceptual cues in the use of spatial deictic terms. The gravitational vertical has been claimed to be of primary importance for the development of these terms. The vestibular system is used to perceive gravitational information. Since vestibular disorders generally coincide with hearing impairment a group of hearing disabled children without vestibular deficits was used as a non-normal control. The results showed that in comparison to normal children, hearing disabled children were minimally delayed in their use of deictic terms. Children with an additional bilateral vestibular defect showed a marked and systematic delay in the proper use of spatial deixis, but the order of the developmental stages in which different reference frames were used was preserved. It seems that the loss of the capacity to process vestibular information has an impact on the speed, but not on the program, that underlies the development of the use of spatial prepositions. A case study with a disordered child who, in addition to a vestibular defect, suffered from a severe visual impairment (myopia) suggested that missing vestibular information may be compensated for during development by visual information processes.

3.1.2 Development of Temporal Reference

Slobin visited the Institute several times during 1985, with support from the U.S.-Netherlands Cooperative Science Program of the National Science Foundation. He was in

residence for the month of July, working on issues of language change, linguistic universals, and child language. His work focussed on the range of meanings expressed in morphological systems of grammar, defining a privileged set of concepts that are repeatedly drawn upon as core organizing points in the formation of grammatical categories, both in ontogenetic and historical development of language.

Slobin continued the research on development of temporality in language, begun at the 1984 MPI workshop, and carried out in collaboration with Berman (Department of Linguistics, Tel Aviv University). Children's developing abilities to talk about events in time were studied in a cross-linguistic investigation of stories told with respect to a standard picture sequence in Hebrew, German, English, Spanish, and Turkish. The languages were selected to represent increasing grammatical marking of aspect, a feature which interacts crucially with the expression of tense and with the division of narratives into foreground and background. A number of interacting parameters have been isolated in an attempt to develop a general theory of the discourse functions of tense-aspect-modality, verb semantics, and interclausal syntax.

3.1.3 Development of Discourse Skills

Hickmann continued her research on the development of discourse cohesion. First, she collected a large sample of spontaneous narratives from French-speaking children between the ages of four and ten years, using picture sequences, as well as films containing dialogues, in situations where children were addressing a "naive" listener. In collaboration with researchers at the University of Peking, Hickmann and

Weissenborn also collected a comparable sample of narratives from Chinese children between five and ten years. These data are part of a larger cross-linguistic project which compares the constraints of different linguistic systems (English, French, German, Chinese) on the development of narrative organization. The analyses focus on three aspects of the narratives: 1) the uses of referring expressions to introduce referents and maintain reference in discourse; 2) the uses of temporal/aspectual markings (verbal inflections, adverbials, conjunctions); 3) the uses of reported speech constructions. Referent-introductions and reference-maintenance in the French narratives were characterized in part by the frequent uses of "dislocated" constructions (mostly "left dislocations", such as "le cheval il arrive"; some "right dislocations", such as "il lui attrape la queue au chat"). Hickmann's preliminary analyses showed that the systematic distribution of referring expressions in such constructions was a function of discourse context, e.g., the absence versus presence and type of coreferential relations with the immediately preceding clause. Hickmann and Weissenborn are also continuing their analyses of temporal/aspectual markings in children's narratives, focussing on interactions among formal factors (given the availability of different markings across languages), semantic factors (e.g., "Aktionsart"), and discourse factors (e.g., "foregrounding/-backgrounding").

Hickmann also continued the research she began earlier with Schneider (UCLA) on how 5 to 10 year-old children process narratives that are not well-formed. Pilot studies using story recall tasks examined the effects of experimentally manipulating the schematic structure of narratives when simultaneous disruptions in cohesion did or did not occur: for example, an inappropriate sequence of coreferential expressions resulting from the displacement of a narrative unit out of its "canonical" position was either left intact or repaired experimentally in various ways. Preliminary results point to

the need for further evaluation of the relative contribution of the cohesive properties of the test versus their schematic structure to children's processing of narratives.

During his 8-month visit at the Institute, Sinha, together with Paprotté (Universität Münster), worked on theoretical and empirical aspects of children's and adults' narrative discourse. Their theoretical work focussed upon the informational characteristics of the communicative context, especially the relationship between the Gricean maxims, topic-comment structures, presupposition and salience. Sinha and Paprotté designed a pilot study involving story re-telling. The relevant independent variables were the presentation medium, thematic continuity, narrative frame, event order, and mutuality of background knowledge. Data collection is currently proceeding using subjects with English and German as first languages. Further, Sinha worked on the preparation of a book to be titled "Language and Representation". This book examines relations between the ontogeny and phylogeny of language, within the context of theories of social-cognitive development and semiotics.

3.1.4 Longitudinal Studies

3.1.4.1 The Stern Project

Deutsch initiated a project in which the old diaries of Clara and William Stern are being typed and reanalyzed. These diaries, which contain very detailed descriptions of the Sterns' three children from birth to adolescence, are among the most comprehensive observational studies in child psychology. Deutsch found this material in Jerusalem, where it is part of the William Stern Archive at the Jewish National and University Library.

In 1985, the books containing material on the children up

to school age were transcribed. The remaining parts should be completed in 1986 and will become part of the Child Language Data Archive at Carnegie-Mellon University and at the Max-Planck-Institut. A selected set of the data has already been used to reconstruct interlanguage systems, that is, linguistic systems which deviate from the target language (here standard German). The Sterns' observations are especially useful for this purpose, because the diaries report innumerable instances of "idiosyntactic" language used by the three children observed.

A first study on children's use of possessives continues a project in which Deutsch and Budwig reanalyzed naturalistic data collected by Brown and his co-workers. Deutsch demonstrated that children acquiring different languages at different moments construct very similar interlanguage systems for the use of possessives. An in-depth comparative analysis of children's uses of nominal and pronominal possessive markers revealed form-function pairings that deviate systematically from the target systems. Children use pronominal forms if control of an object or an action is desired, but they use nominal forms if the relationship between 'possessor' and 'possession' is relatively stable from their point of view.

A second study, together with Ehrich and Roche, was conceived during the Max-Planck workshop on temporality in 1984. It involves reconstructing the tense-systems that Hilde, Günther and Eva Stern developed. Preliminary results were obtained from a functional analysis of tense shifts. All instances of tense-shifts reported in the diaries between the ages of 2 to 4 were analyzed. This analysis revealed that the aspectual and temporal function of tense shift did not develop sequentially, but that both functions were present simultaneously in the children's early grammatical systems. Tense shifts were expressed by verb inflections, indicating shifts from the Present Perfect to the Present, or vice versa. Only later did adverbial shifters come into play. The results,

for these children at least, suggest that the multiple functions of tense shifts in German are present from an early age and - in contrast to second language learners of German, as studied by von Stutterheim - that inflectional devices are preferred over lexical (adverbial) devices.

3.1.4.2 Cross-Linguistic Comparisons

Weeks finished collecting longitudinal data on two Dutch children's language development (weekly recordings of the child interacting with a parent over a period of two years). This corpus and comparable corpora from English and Spanish constitute the database for a cross-linguistic comparison of children's early language development. The purpose of this study is to test the prevalent assumption that there is a universal semantic basis for the acquisition of grammar. Slobin has hypothesized that a small set of grammatically-relevant semantic relations constitutes an important component of an innate "Language Making Capacity" and that these relations will therefore be universally expressed in children's earliest grammars. In the present study it is predicted that, counter to Slobin's proposal, significant cross-linguistic differences in the expression of motion and location will be found at the earliest stages of acquisition. These findings are expected to reflect systematic differences in the semantic (and associated morphosyntactic) structures of the input languages.

3.1.4.3 Language Acquisition in Bilingual Children

In her dissertation research, Berkele has been studying early reference to objects by bilingual children (German/French), with special emphasis on the acquisition of determiners and the different semantic and pragmatic functions expressed by them. This work is part of a research project at

the University of Hamburg under the direction of Meisel. The children were video-taped at regular intervals between the ages of two and five years. Berkele transcribed selected child-adult interactions. So far, her analyses have focussed on two problems: 1) When and how do children acquire the function and linguistic means of determination of the adult system? 2) Do their expressions of reference at certain stages obey a rule system of its own?

3.1.4.4 Language Acquisition in Blind Children

During her two month visit, Andersen worked on a longitudinal project in which certain aspects of first language acquisition in blind and sighted children were compared. Special emphasis was given to the contribution of siblings to language acquisition. Andersen demonstrated that older siblings are often less able or willing to accommodate younger siblings' restricted linguistic abilities than are adult caregivers and that the unwillingness to accept inarticulate and inappropriate utterances provides an impetus for younger siblings to rethink and refine their hypotheses about language. She concluded that interaction with siblings (or peers) may be particularly important for language development in atypical populations, especially for visually impaired children who have special difficulty with the pragmatics of language use.

Andersen also explored the transition from formulaic to analyzed speech in a case study of a blind child, which covered a two year span. Examination of the morphological development of this child revealed dramatic U-shaped curves for several morphemes over the same 2-3 month period. This pattern was due to errors of omission; when the child began to use a high proportion of analyzed speech she left out necessary morphemes in her analytic utterances, while maintaining them in formulas -- suggesting a period when the two systems, formulaic and analytic exist side by side, with the former decreasing as the

latter takes hold.

3.1.5 Linguistic Theory and Language Acquisition

3.1.5.1 Implicational Universals and Language Acquisition

Hawkins investigated the role of implicational universals as predictors of first and second language acquisition. His theoretical starting point was a critique of the work of Roman Jakobson in the classical monograph Child Language, Aphasia and Phonological Universals. Jakobson assumed that children's acquisition of certain phonological properties (phonemes or phonological oppositions) could be predicted on the basis of implicational universals to precede the acquisition of other phonological properties. According to Hawkins, however, implicational universals can never predict that one property will precede the acquisition of another. They can only predict that the acquisition of the consequent part of an implicational statement will either precede or occur simultaneously with that of the antecedent property. An evolving child language system that has neither antecedent nor consequent properties at some early stage may develop the consequent property first (thereby corresponding to the languages with consequent only), or may develop antecedent and consequent simultaneously (corresponding to the languages with both). All that can be ruled out is the acquisition of the antecedent before the consequent, since no languages of this type are attested. Hawkins defined a number of explicit predictions along these lines for both first and second language acquisition, and tested them on relevant acquisition data in phonology, morphology and syntax. The results confirmed the predictions that were tested.

3.1.5.2 Universal Grammar and the Acquisition of Anaphors

Deutsch, Ch. Koster and J. Koster (K.H. Tilburg), continued their research on children's acquisition of sentence-internal anaphors. They conducted, in cooperation with Corver (K.H. Tilburg), an experiment in which children were asked to act out sentences such as the following:

(a) Jan slaat met Piets liniaal op zichzelf

John is hitting with Pete's ruler on himself

(b) Jan slaat met Piets liniaal op hem

John is hitting with Pete's ruler on him.

Subjects were 60 Dutch children between 6 and 10 years. The outcome of this experiment confirmed some of their earlier findings. An analysis of children's errors in interpreting sentences like (a) and (b) demonstrated that errors with sentences containing bound-anaphors like (a) disappeared earlier compared to sentences containing unbound (free) anaphors, like (b). However, especially younger children made errors in both directions, i.e. free anaphors were interpreted as bound-anaphors and vice versa. Contrary to a simplistic interpretation of the Subset Principle of Universal Grammar, children appear to overgeneralize the domain for pronominals, so that the non-locally bound pronominals are also used as locally bound anaphors. The authors suggest a mechanism by which children's formation and change of a domain hypothesis can be explained. This mechanism represents a dynamic, but nevertheless structurally constrained view of children's attempts at anaphoric resolution. The proposed mechanism is in accordance with a more refined interpretation of the Subset Principle.

3.2 Second Language Acquisition

3.2.1 The ESF Project

The ESF study of language acquisition by guest workers has generated large sets of highly comparable, cross-linguistic data. (A full description of the project is given in the 1981 Annual Report.) 1985 saw the completion of data collection for the main longitudinal group, and for the initial learner control group. For two thirds of the informants from the long residents' group, data collection is also finished. The data are progressively being transcribed and stored on the computer; a process that is expected to be completed during 1986. The complete data set will then become available - under the usual conditions of access - to interested researchers who are not directly involved in the project. This data set will be stored at the MPI, which has provided the central coordination of the project.

At the 1984 Meeting of the project's Steering Committee (see the 1984 Annual Report), agreement was reached on a schema for cross-linguistic pilot analyses using longitudinal data from one informant per second language (SL)/target language (TL) pair, for the six major research areas of the project. These areas are: the process of understanding in the acquisition of a second language, feedback giving and eliciting, utterance structure, lexicon growth, reference to space, reference to time.

Within the research area "utterance structure" Klein and Perdue continued their work on the characterization of the linguistic repertoire of beginning adult acquirers, and how they use this repertoire in solving complex verbal tasks. Data from a re-telling task by 3 informants - VI, RA, RU - acquiring respectively German, French and English, were examined in an attempt to explain the regularities observed in a pilot study in 1984 (see the 1984 Annual Report).

For these informants, the principles accounting for the internal organization of utterances in connected discourse were of three types, namely phrasal constraints, semantic role properties and overall discourse organization.

PHRASAL CONSTRAINTS on the respective positions of nominals (N: nouns with or without a determiner, proper names, pronouns) and verbals (V: inflected or uninflected lexical verbs and copula-like constituents) gave a clear basic pattern for the three learner varieties:

$N_1 - V - ((\text{Prep}) N_2)$,
with two infrequent exceptions: for VI and RU, "presentationals" (for the most part, a verb of "arrival on the scene" and its argument) had the order $V - N_1$; for RA, N_2 can be realized as a clitic pronoun under conditions described below, giving the order $N_1 - N_2 - V$.

The SEMANTIC ROLE PROPERTIES obtaining between V and its arguments in the full basic pattern determined which of the Ns occurred as N_1 and N_2 : the referent of that N which is in control of, or intends to be in control of, the other referent fills N_1 position. "Degree of control" is defined as a continuum of asymmetrical relations ranging from clear agent-patient relations to (intended) possession. These two constraints accounted for the structure of the majority of utterance-types in the texts, with the exception of constructions where no "degree of control" pertains, namely those which predicate a property of a referent.

Constituent order in this latter type of construction could however be accounted for by appealing to the OVERALL ORGANIZATION of this particular type of narrative, and in particular to the (implicit) quaestio that must be answered for the narrative to be well-formed.

With this framework a narrative is an answer to a question function Q_i , where i ranges over time intervals:

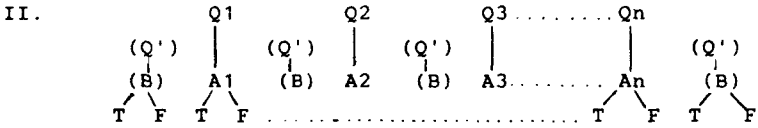
Q1: What happened (to p) at t_1 ?

Q2: What happened (to p) at t_2 ?

where t_1, t_2, \dots reflect the chronological order of the events recounted, and where p is one or more (subjectively selected) protagonist(s) that the speaker can introduce, maintain, change or reintroduce. The time interval t_i , and maintenance of reference to a protagonist from Q_i to $Q_i + 1$ may be explicitly marked, or left implicit. This question function defines the foreground of a narrative. Other question-types - why?, where? - provoke different types of background information. All question-types raise a set of alternatives from which one is specified as an answer. What is specified is termed here "focus" (F), the rest of the answer being termed "topic" (T). For the texts studied, the major regularity for constituent ordering within an utterance is:

I. F comes last

If we term 'A' the answers to foreground questions - Q_i -, and 'B' the answers to background questions (Q'), the organization of these texts is then:



For constructions which predicate a property of a referent, that (Prep) N which belongs to F, comes last.

These rules also suggest explanations for:

- (i) the exceptional constituent order of most "presentationals": these (mostly) function to mark the "arrival on the scene" of a protagonist, thus the N referring to this protagonist belongs to F;
- (ii) the position of the pre-verbal clitic N_2 for RA, and more generally the internal structure of Noun Phrases. Proper names and nouns accompanied by the indefinite article serve to introduce referents in T and F. Nouns accompanied by the and this refer to entities which in successive utterances have moved from T to F, or from F to F. Nouns

with a demonstrative article, and pronouns, mark the result of transition from F to T (hence the clitic N_2 for RA and, possibly, the absence of inflected pronouns in the production of VI and RU). Pronouns, the N, and zero anaphora mark the result of transition from T to T, their choice depending on the relative closeness of the utterances: for example, zero anaphora typically occurs for topic maintenance in foreground utterances immediately following foreground utterances, or background utterances immediately following background utterances;

- (iii) when a time adverbial explicitly marks the time interval t_i , then that adverbial is in T, typically in utterance initial position. As the foreground of the narratives ranges therefore over bounded time intervals, events of the foreground are typically presented perfectly. The embryonic verbal conjugation encountered in these texts was used by informants to signal imperfectly presented events, or anteriority, in background utterances, whereas they used the base form of Vs in foreground utterances.

These results are preliminary. In particular, performances in other Tls, in other text types and at other stages of development must be examined before conclusions can be drawn. They do however suggest possible lines of explanation for some existing descriptive second language acquisition studies of the progressive complexification of NP structure, the development of verbal morphology, and the order of acquisition of pronouns. In addition, this study gives a definition of the foreground-background distinction in terms which are independent of the linguistic terms used to signal it (thus avoiding the circularity of some other studies). Moreover, the T/F distinction, as it is defined here, accounts for the presence of indefinite Ns in T, and of definite Ns in F, i.e. it explains exceptions to the "go from given to new" principle.

3.2.2 Effects of Observation

Edwards, in collaboration with Levelt, planned the control analyses for the ESF project, which will involve comparisons of the longitudinal informants with "control" informants who are demographically similar to but less frequently observed than the main informants. The goal of this part of the project is to identify any effects which the fact of observation itself may have produced and thereby determine the degree to which the conclusions regarding the longitudinal informants can be generalized to the guest worker population as a whole--that is, to guest workers acquiring a second language in the absence of frequent contact with interviewers and participation in a study. The analysis will be completed in the coming year, following receipt of the data from the relevant teams.

3.2.3 Terms of Exchange

Working with the data available from the ESF project, Suben began an investigation of the development of a single semantic field, namely terms of exchange (give, take, borrow, steal, buy, etc.). The questions of interest include the interaction between source and target languages - in terms of facilitation and interference - which might be predicted by the degree of correspondence between the semantic spaces of the two languages, and the basic issue of how related concepts are represented in the mental lexicon. Analyses of the rate and pattern of acquisition for these terms in the corpus of a single subject have been started and, if fruitful, will be extended to more subjects in a search for possible cross-linguistic generalizations.

3.2.4 German Speakers' Accommodation Towards Second Language Learners

Roche completed his dissertation work on German speakers' accommodation towards second language learners in natural settings. Their language (xenlect) can be characterised by four different levels of grammatical changes in utterances (a-, b-, c-, d-utterances, as already described in the 1984 Annual Report). Roche was able to determine the following pragmatic regularities in German speakers' xenlects:

- (a) 'compression' of the message was found in all pragmatic utterance types;
- (b) the thematic scaffolding of the message showed the strongest structural utterance changes. Nevertheless, utterances that were attached to the main scaffolding of the message (evaluations, comments, metacommunicative insertions) were usually realized in accordance with the standards of colloquial German. This was also true for reflective speech and asides.

The findings are in accordance with a minimal effort principle for the xenlect speaker. On the one hand, structural changes can be seen as the result of adaptation processes to the anticipated needs of the addressee. On the other hand, the xenlect speaker also tries to preserve as much as possible normal habits of producing utterances. In the xenlect the speaker switches from heavy changes to standard forms and vice versa, depending on the communicative needs of the listener and on the planning capacities of the speaker. Thus, a xenlect should be seen as a communicative aid for both sides of the communication process, the native speaker and the foreign listener, but not as a means to stigmatize underprivileged foreigners.

3.3 Other Research Activities

Romaine continued analyses of the data on Panjabi code-switching and language attitudes collected as parts of the project "Language loss and maintenance in a multi-ethnic community". The first field visit to Papua New Guinea as part of the project on language acquisition, creolization and language change in Tok Pisin was planned for the end of 1985 and beginning of 1986. Wright was employed as a research associate.

A new project on Aboriginal English in South Australia was initiated by Romaine with Wales, Department of Psychology, University of Melbourne. The research was funded by the British Academy and University of Melbourne. The investigation concerns syntactic, semantic and prosodic features which distinguish Aboriginal varieties of English, and the extent to which these and other ways of using English reflect Aboriginal norms of interaction and function as symbols of Aboriginal identity.

Whilst visiting the institute, Nelson concentrated on discussing theoretical issues in language acquisition and language intervention, including individual differences and input analysis.

4. LANGUAGE DISORDERS

This section summarizes the research of a group working on "Aphasia in Adults". Since 1982, this research has been supported by the Dutch Science Foundation (ZWO). In 1985 research efforts concentrated on two related points. The first concerns the theory of adaptation. Within this framework, aphasic symptoms are seen as the result of a process by which the patient either uses an impaired linguistic system or switches to a special but "normal" register, namely, the elliptic register which results in telegraphic speech. The second point is the nature of the deficit in aphasic patients. Diverse tasks are used to disentangle various knowledge and processing components underlying aphasic symptoms. This multi-task approach may, on the one hand, help avoid false generalizations based on limited performance data and, on the other hand, provide a more complete picture of the linguistic (dys-)functioning of aphasic patients.

4.1 The Adaptation Theory of Agrammatism

Heeschen, together with Kolk (K.U. Nijmegen), worked on the refinement of the adaptation theory of agrammatism. Their joint theoretical efforts resulted in a coherent framework for the proposed continuation of the aphasia project (1987-1991) and a new perspective for the reanalysis of previously collected data.

4.1.1 Telegraphic Speech as a Positive Symptom

The adaptation theory of agrammatism hypothesizes that a brain damaged patient either uses his impaired system or switches to a different, but intact "normal" system. As early

as 1884, Jackson drew the distinction between negative and positive symptoms - the negative ones being the result of the use of the impaired system, the positive ones being the result of the use of a substituting system. According to Heeschen and Kolk, the patient with positive symptoms uses a substituting (but normal!) system much more frequently and more extensively than a normal subject, who uses it only occasionally and for special purposes.

Thus, the telegraphic speech of agrammatic patients is considered to be a positive symptom. The telegraphic expressions produced by the patients could also have been produced by normal speakers - with one restriction: a normal speaker produces telegraphic or elliptic expressions only occasionally in pragmatically highly specified situations while the patient produces them almost continuously.

The observation of the correctness of aphasic telegraphic expressions was already made in 1922 by Isserlin, but the theoretical relevance of this observation has been completely ignored. Kleist's view of the telegraphic style as lacking any syntactic structure has dominated aphasiology and, most notably, the psycholinguistic approaches to agrammatism in the last two decades.

In 1985, Kolk and Heeschen continued their inspection of large corpora of spontaneous telegraphic speech. They were able to demonstrate that telegraphic (or normal elliptic) speech possesses subtle and refined morphological and syntactic structures, since this speech follows the correct positional rule when verbs are used in finite form and make virtually no errors with respect to adjective inflection in definite modified noun-phrases. Kolk and Heeschen concluded that telegraphic or normal elliptic speech is planned by the speaker from the very beginning. It is not the result of a process of

"regrammaticalization", as stated in the 1984 Annual Report. So far, Kolk and Heeschen have demonstrated the correctness of telegraphic aphasic speech via the correctness of the elements present in this form of speech. It now becomes important to analyze absent elements, for example, concerning the elision of the finite verb part in what Klein has called F-ellipsis. This research began at the end of 1985.

4.1.2 Adaptation Theory and Language Processing

The adaptation theory should account not only for patients' performance in production, but also for their language comprehension abilities. Kolk and Friederici (1985) have suggested that during sentence processing a patient directs his attention to those parts from which he expects to get the most relevant information (given the specific task) that he can use.

In a dissertation project, Grötzbach started a series of experiments to investigate this problem. He used a sentence-picture matching task to determine what linguistic information is used by German paragrammatic aphasics in sentence comprehension. Semantically reversible sentences were presented in either canonical or topicalized word order. Furthermore, the sentences were cut into three fragments of increasing size: only the first NP consisting of the case-marked definite NP, the first NP plus the verb, or the whole sentence. The results for the sentences in canonical order showed that the additional syntactic information carried by the second and third fragment only slightly improved sentence comprehension compared with the presentation of only the first fragment. Performance on sentences with topicalized word order was relatively good when the first fragment was presented. However, performance dropped to chance level with the presentation of the second fragment. With the third fragment, however, performance rose again to first-fragment

performance level. Research in progress aims at further specifying the nature of this interaction between sentence type and sentence fragment size and its relationship to adaptation theory.

Hagoort and Heeschen reanalyzed the data obtained from a question-answering experiment described in previous reports. These reanalyses revealed that agrammatic patients produced more correct active than passive sentences if the question elicited an active answer and the actor was animate, but that they were better with passives than actives if the question elicited a passive answer and the semantic object (the grammatical subject of the passive) was animate.

The latter finding is at odds with most current theories of agrammatism according to which syntax per se is impaired in agrammatism. These theories must predict that agrammatic patients always perform worse with more difficult constructions such as passives. Hagoort and Heeschen suggest that agrammatics, however, are strongly dependent on the congruency between the requirements of the context and the semantic properties of the subject. Thus, agrammatics can get into difficulties even with simple actives when these sentences require an inanimate subject and an animate object. According to Heeschen the agrammatics' critical dependence on conventionality is just another type of adaptation, which is absent in Wernicke patients.

4.1.3 Adaptation and Non-adaptation in Grammatically Disturbed Patients

Heeschen, together with Kolk also worked on the question of why some patients (mostly agrammatic Broca-patients) with impairments of grammar adapt by using the substituting system of elliptic speech, whereas other patients (mostly paragrammatic Wernicke-patients) continue to use the impaired system. Heeschen elaborated on Goldstein's (1948) idea that an

important class of symptoms protects the patient against a catastrophe reaction. The catastrophe reaction in brain damaged patients is usually triggered by tasks which overtax the patient and makes him produce errors. However, one additional condition for the occurrence of the catastrophe reaction is self-awareness of errors. Inspection of the speech of agrammatic patients produced under conditions where they were prevented from applying telegraphic style revealed that the patients were aware of and bothered by their failure - as evidenced by the frequently interspersed self-blaming comments and curses. The Wernicke-patients behave quite differently. Although even their spontaneous speech is full of errors, they are either not aware of it or not particularly concerned about it. Thus, there is no need for them to adapt by developing telegraphic speech; they may continue to use the impaired system without running the risk of getting into catastrophic conditions.

In order to substantiate these views on the reasons for adaptation and non-adaptation in grammatically disturbed patients, Heesch together with Ryalls and Hagoort investigated the average fundamental frequency (F_0) of the patients' speech under various conditions. The F_0 is generally accepted as a valid indicator of psychological stress.

In a first investigation, utterances of approximately the length of a normal main clause were randomly selected from the spontaneous speech and from a formal test of patients. The latter sample came from a specific picture description task where the agrammatics gave up telegraphic style and switched over to attempts to speak in complete sentences. Eight Broca-patients with telegraphic style in their spontaneous speech and 8 Wernicke-patients with paragrammatism were investigated. The results demonstrated that only in the specifically stressful test condition did the Broca patients have a higher F_0 than the Wernicke patients. There was no group difference in the F_0 of the spontaneous speech. A second

experiment was carried out where the type of speech required in the two conditions (informal conversation vs. formal test atmosphere) was the same. The results suggest that Broca-patients are more sensitive to situational factors and more vulnerable to stress.

4.2 Selective Disturbances of Syntactic Processing

Bayer continued work that was begun at his previous research unit in Aachen, together with de Bleser and Dronsek. This work was mainly devoted to the study of patients with selective disturbances of syntactic processing but with lexical representation/processing essentially intact. In the domain of case-marking in German it was found that agrammatic patients were able to inflect complex NPs of the type Art-Adj-N correctly with respect to gender, number and even case. Their performance on case-marking dropped sharply as soon as case had to be assigned to constituents that did not occur in canonical SVO or SVPrepO order. In addition, it was shown that agrammatics have considerable abilities in exploiting case- and verb-morphology in a sentence arrangement task with legal non-words. Detailed morphological investigations were carried out on a case study of deep dyslexia. It was shown that this deep dyslexic made a full visual analysis of the input in a reading task and that the disturbance arose only at a relatively high cognitive level. It turned out that the most crucial factor in reading correctly or in making a predictable semantic error was whether a morpheme had referential semantics in the broadest sense.

4.3 The Parallel Interface Model and Aphasic Deficits

Friederici developed her parallel interface model and applied it to aphasic deficits. This model assumes that normal comprehension involves the parallel processes of two rather independent information processing systems: a language system consisting of a number of subcomponents and a general cognitive system. These two subsystems are connected by a one-way interface allowing information to flow only from the language system to the general cognitive system.

In order to allow parallel operation of the language system and the general cognitive system, each of the different language components forwards its information to the general cognitive system as soon as possible. If the sentence representation provided by the language system can be integrated with the general knowledge, it is understood. If the language system fails to construct complete sentence representations, the general cognitive system immediately offers possible interpretations based on interpretative strategies which at least in part compensate for missing linguistic information. These interpretation strategies - used by the normal listener - may also be used by aphasics when they fail to construct complete sentence representations.

Within this model, agrammatism of Broca's aphasia is seen as an impairment in the capacity to automatically process the syntactic information associated with closed class elements. Since processing of this information is hindered, Broca's aphasics fail to construct adequate sentence representations. Each subcomponent of the language system, however, still gives its available information to the general cognitive system which immediately starts to construct possible interpretations. Whereas agrammatism is attributed to processes primarily involving automatic retrieval of syntactic information, paragrammatism of Wernicke's aphasics is seen to involve impairments of processes which are responsible for the

integration of different information types. These descriptions of aphasic deficits predict that Broca's and Wernicke's aphasics should perform differently in on-line tasks where automatic processing is tested, whereas they should perform similarly in off-line tasks when comprehension is based on the same set of interpretation strategies.

Data collected during the last years have supported this view: when tested in on-line tasks the two patient groups showed qualitatively different performances, but when tested in off-line tasks these groups often demonstrate very similar behaviors.

In order to investigate the issue of syndrome-specific deficit further, Heeschen, Friederici and Drews used a lexical decision task which was previously used with normals (Friederici and Heeschen, 1983 Annual Report) with aphasics. The experiment investigated the subjects' ability to retrieve inflected open and closed class elements from the lexicon. The findings for normals had suggested that open class elements are decomposed into stem and inflectional suffix during recognition, whereas inflected closed class items are retrieved as a whole. The results from 4 agrammatic and 3 Wernicke patients suggested that agrammatics treat closed class words like open class words, that is, they decompose both types of words into stem and inflectional morpheme. Wernicke's aphasics, in contrast, showed a response pattern which was similar to normal controls. Because of the relevance of these findings for both Friederici's and Heeschen's approach to agrammatism, the study is currently being replicated. In addition, several experiments which aimed at investigating this issue, using a priming technique and normal subjects, are currently being carried out and will supply normal baseline data for aphasic research.

4.4 The Relevance of the Open-Closed Class Distinction

Kean and Koster continued their work on the role of open and closed class elements with respect to the characterization of aphasic disturbance. They designed a word monitoring experiment to investigate the RT to target words of different syntactic categories, and thereby to investigate the RT differences within the class of closed or open-class elements as well as the RT differences between the two classes. The test sentences have been constructed in minimal pairs, with the pretarget and target words representing contrasting syntactic category combinations of open-open, open-closed, closed-open and closed-closed class elements. The last two contrasts are illustrated in the following minimal pair:

1. De directrice wilde toch BONTE bloemstukken voor de receptie bestellen.

The directrice wanted after-all (adv., closed) COLORFUL (adj., open) flower-arrangements for the reception to-order.

2. De directrice wilde toch BEIDE bloemstukken in de receptie plaatsen.

The directrice wanted after-all (adv., closed) BOTH (quantifier, closed) flower-arrangements in the reception to-place.

As illustrated, each sentence pair consists of sentences which are identical up to the target words (in this case, BONTE and BEIDE). On the basis of results from an English pilot experiment, it is predicted that the RT-difference between BONTE and BEIDE will be smaller than between, for example, BONTE and BOEREN ('farmers', noun, open class) in a different, matched test sentence pair. The preparation and pretesting of the test materials has been completed in 1985. The testing of Broca and Wernicke aphasics and normal subjects will be carried out in 1986.

4.5 Real-Time Language Processes in Aphasic Patients

Tyler and her research group have been using the Marslen-Wilson & Tyler model of the real-time processes involved in language comprehension as a framework for studying disorders of language. Within this framework, they ask a number of basic questions about language comprehension deficits. First, is the comprehension deficit due to a breakdown in the automatic processes underlying on-line language processing, or rather in the off-line processes which operate on the products of these core processes -- as reflected in tasks such as question-answering and sentence-picture matching? Second, is a patient's deficit due to a loss of stored information or to difficulty with the processes that access that information? If access is unimpaired, does the problem lie in the ability to use particular types of information to build a representation or to integrate different types of analysis? Third, what specific aspect of the processing system is functioning abnormally? Fourth, if some aspect of the patient's processing system is selectively impaired, what implications does this have for the rest of the system? In normal language understanding, an incompletely specified input on a level of the system can be compensated for by constraints available at other levels. Does the same kind of compensation -- perhaps in a more extreme form -- occur with language comprehension deficits?

To address these questions they used experimental tasks which tap the listener's representation of the input as it is being constructed on-line. The core processes operate upon a transient, continually-varying input -- the speech signal -- that is distributed over periods of time ranging from a few hundred milliseconds to several seconds. To determine what types of analysis the listener performs, and when he or she performs them, tasks are required which elicit fast responses which can be closely related in time to the speech input. It

is then possible to try to determine what kind of representation the listener has developed, given the input available at the point the response is made.

Tyler's general strategy for studying real-time language processes in aphasic patients involves taking a mixed group and case-study approach and developing a processing profile for each patient. The profile attempts to cover the sequence of mental operations involved in on-line processing and also includes performance in off-line tasks, in order to build up a picture of how a patient's language processing system functions. The important data is the pattern of results across a wide range of experiments, rather than data from a single experiment.

To date Tyler and her group have tested 10 English aphasic patients (classified on the basis of BDAE) on 8 different experiments designed to probe different aspects of their real-time language comprehension system - ranging from experiments which tap the analysis of the sensory input (phoneme discrimination task, auditory lexical decision task, gating task) to those which examine the properties of lexical access and lexical representations (suffix experiments, anomalies experiments), to those which examine the patient's ability to construct higher-level syntactic, semantic and prosodic representations (prose experiment, phonological phrase experiments). On the basis of these data Tyler intends to construct experiments which tap even more specific aspects of language processing in these patients.

4.6 Metalinguistic Abilities in Aphasia

Kean, together with Koster, Blomert and van Mier, continued the study on the possibility of preserved metalinguistic abilities in aphasic patients, as suggested in 1983 by Linebarger, Schwartz and Saffran. The subject pool

included 36 normal controls subjects and 35 aphasic subjects (including paragrammatics and global aphasics as well as agrammatics). The task, a grammaticality judgment task, capitalized on off-line metalinguistic aspects by including an additional probe task. After the subject has given his judgment of a sentence, he is asked a question about it or is given a contrasting sentence to judge. The probe was introduced to investigate the motivation behind the decision processes in such a task. The results showed that - contrary to Linebarger et al. - the agrammatic patients made many mistakes in judging the same sentences. Moreover, there were almost no significant differences between the aphasic patient groups in the total error scores; the agrammatic, paragrammatic and global patients do not seem to differ in their metalinguistic abilities when it comes to judging the acceptability of different sentence constructions. The analysis of the relationship between the judgment responses and the probe items is still in progress.

4.7 Everyday Language Abilities Test

Blomert, Koster, v. Mier and Kean continued their work on the "Alledaagse Taalvaardigheidstest" ATT (Everyday Language Abilities Test). This test was developed to measure the communicative abilities of patients with language-disorders, since, as predicted by the adaptation approach, their ability to get along verbally in everyday situations may radically differ from their degree of grammatical impairment as measured by a formal language test like the "Aachener Aphasietest" (AAT). The ATT consists of daily life scenarios to which the subjects are asked to respond. Each scenario involves information which is absolutely necessary for successful communication and also information which, although not necessary, is conventionally given anyway. The test has been

carried out with groups of 30 control subjects, and 17 Broca and 12 Wernicke patients. The results showed that both aphasic groups were quite similar and successful in bringing the necessary information, but less successful in producing conventional information. So the prediction that there would be a divergence between the patients' formal linguistic abilities (as assessed by the AAT) and their ability to cope with situations requiring communicative-interactive abilities (as assessed by the ATT) was confirmed.

OTHER ACTIVITIES 1985

1. The Language Universals Project

The 2-year project on Explanation in Universal Grammar, organized by Hawkins and Holmback, was completed in 1985. Its goals, set out in the 1983 and 1984 Annual Reports, were to investigate the factors that can explain the language universals derived from cross-language comparisons, (e.g. semantic, processing and functional explanations). An additional focus of the project was language acquisition. What predictions do current language universals 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?

The primary participants in the project during 1985 were: (the regular scientific staff at MPI) Hawkins, Holmback, Bowerman, Frauenfelder and Levelt; Andersen (USC), van der Auwera (Antwerp - Humboldt fellow), Chung (UCSD), Dryer (Alberta), Frazier (Amherst), Gilligan (USC), Hall (USC), Keenan (UCLA), Timberlake (UCLA); (the fellows at NIAS) Hoekstra (NIAS and Leiden), König (NIAS and Hannover), and Thompson (NIAS and UCLA).

There were several meetings, talks and workshops during the year, held both at the MPI and at NIAS. Holmback organized regular meetings of a research group which discussed the role of processing factors in explaining various types of cross-linguistic grammatical phenomena. Frazier made a number of presentations at these meetings which helped to clarify the relationship between processing and syntactic universals.

1.1 Word Order Parameters

While visiting the Institute, Chung investigated several topics in the syntax of V(erb) S(ubject) O(bject) languages. She attempted to determine whether SVO word order correlated with the presence or absence of nonfinite clauses "smaller" than infinitives. Such "small clauses" occur in SVO languages such as English (e.g. There is someone screaming) and French (e.g. Je crois Marie intelligente).

Two major results were obtained. First, it was established that in Chamorro, a VSO language, existential sentences do not involve a small clause, despite initial indications to the contrary. This result is significant because it is widely assumed that existential sentences in English and other languages do involve a small clause. The failure of Chamorro existentials to utilize the small construction seems to be tied to the larger fact that the language evidently has no small clauses at all.

Second, it was established that Modern Irish, another VSO language, does have small clauses, with a distribution both different and wider than small clauses in English or French. The syntax of Irish small clauses revealed that major differences in distribution appear to follow from the fact that Irish generally permits nonfinite subjects in a wider range of contexts than do most SVO languages. This research was undertaken with McCloskey, Department of Irish, University College Dublin, who was a visitor at the Institute for a brief period in August.

In short, the occurrence of small clauses appears not to be tied directly to word order type. This conclusion adds to the accumulating evidence that VSO languages exhibit no major differences from SVO languages, aside from the word order difference itself.

During his four months at the Institute, Dryer performed an extensive analysis of his corpus on the syntactic properties of over 400 languages. He developed programs that analyzed this corpus for correlations between different word order parameters. These programs included a complex method of weighting languages according to their genetic classification to avoid problems of genetic bias that have plagued previous work in this area. In general, the correlations examined were those between the order of various pairs of grammatical elements (such as noun and adjective) and the order of verb and object, correlations that have been proposed by various people (e.g. Greenberg, Lehmann, Vennemann, Hawkins). These results showed that contrary to wide belief there is no relationship between the order of verb and object and the order of noun and adjective. It was also demonstrated that certain general features of the languages of Europe and Asia are not generalizable to other languages and that certain conclusions of previous researchers are biased due to the Eurasian languages in the samples used, and are not reflections of 'general' properties of language. Finally, Dryer showed the existence of exceptions to the majority of 'exceptionless' universals proposed by researchers like Hawkins.

1.2 Syntactic Typology

During his stay at the Institute, Timberlake was engaged in joint research with Keenan on the application of formal grammar - in particular, categorial grammar - to problems of syntactic typology. He examined predicate formation rules, morphology, aspect, and thematic relations from this perspective in order to argue that these diverse phenomena from different domains of syntax can be described in terms of a uniform, categorial approach to language, both within given language systems and typologically across language structures.

2. Annual Conference

An interdisciplinary workshop on "Language Universals and Language Acquisition", organized by Andersen and Hawkins, was held at the Institute from August 11-15. In addition to members of the Institute, the following researchers in cross-linguistic universals and first and second language acquisition attended the workshop: E. Andersen, J. van de Auwera, M. Bamberg, E. Bavin, R. Berman, N. Budwig, H. Clahsen, P. Clancy, E. Clark, M. Dryer, M. Erbaugh, S. Ervin-Tripp, M. Fortescue, G. Gilligan, C. Hall, H. Jisa, M. Kail, E. Keenan, P. Lieberman, M. Lujan, J. Meisel, M. Mithun, M. Smoczynska, D. Slobin, L. Stassen, and A. Timberlake.

The major goals of the workshop were to explore productive ways to investigate the relation between language universals and language acquisition, and to examine how predictions from cross-linguistic universals work out in acquisition. In particular, the focus was on major developmental stages and/or error types that might shed light on the relationship between acquisition stages and language universals, or suggest further formulations or revisions of universal predictions.

The first day of the workshop included presentations to the entire group by Hawkins ("Universal Hypotheses for Language Acquisition"); by Keenan ("Experimental Results on the Psychological Validity of the Accessibility Hierarchy"); by Slobin ("Universal Semantic Hierarchies and Acquisition"); and by Bowerman, ("Finding the Connections between Language Universals and Language Development: Some Things to Keep in Mind about Interpreting Acquisition Data").

The participants then formed five smaller working groups, each of which focussed on a specific area of investigation. The topics of the working groups were: (1) relative clauses and the accessibility hierarchy of Keenan and Comrie; (2) universal semantic hierarchies, particularly the relevance hierarchy proposed by Bybee; (3) primary meanings, particularly

the role of animacy; (4) lexical rules; and (5) phrasal and morphological order (and the notion of "head order").

On day 2-5, there were working group meetings in the morning and larger group sessions in the afternoon where working groups could pose problems for general discussion, and/or request particular information on the wide range of languages represented in the larger group.

In the final afternoon session, each group presented a summary report on the questions they had explored and the conclusions they had drawn. In addition, the organizers compiled a list of researchers working in cross-linguistic studies of acquisition and their areas of interest.

3. The CELEX project

During 1985 the Institute, in collaboration with several other Dutch institutions, prepared a proposal for the establishment of a Center for Lexical Information (CELEX). The purpose of this Center is to create a computerized, multifunctional database, containing lexical information for English, Dutch, and German. Included in the database should be phonological, morphological, syntactic and frequency of occurrence data for each lexical entry. In December the Dutch government granted the project funding for a three-year period and put the project under the wings of the University's Interfaculty Research Unit for Language and Speech, located in the new Max-Planck building. Also during the year, a one-year pilot project was begun at the Institute with the goal of setting up an initial working database for Dutch.

4. Activities of the Technical Group

The primary activity of the Technical Group in 1985 was planning and executing the transfer of the technical facilities to the new building. After making detailed calculations of the

load on the computer, the Technical Group decided to link users with PCs and terminals to the computers via terminal servers and Ethernet. The Technical Group has since established an Ethernet-based local area network in the new building. The Technical Group also linked the Institute to an international network EARN. It is hoped that the Institute will become a real EARN node early in 1986.

In the new building, the Technical Group has installed a second VAX which will serve in a new multi-user speechlab. For this purpose sophisticated graphic terminals have also been acquired. These should provide the user with advanced features such as multiwindowing. Finally, a new way of transmitting both digital and analog signals over longer distances has been designed and successfully tested so that speech work-stations can be located throughout the building.

Another main concern of the Technical Group was the testing of different relational data base management systems (DBMS). The selected DBMS package should be acquired early in 1986 to serve as a tool for use and/or investigation of lexical, eye movement, and administration databases. In this respect the Technical Group was active in planning the CELEX lexical data base project. In the field of eye movement analysis a new PDP together with a new processor for generating fast graphic and/or α -numeric stimuli has been made operable, giving greater capacity both for running experiments and analyzing data.

The program, DOCSYS, has been installed to establish an automatized library administration and access. This system can be used by individual scientists in the future. Huge amounts of data from the Child Language Exchange System (CHILDES) and the ESF Second Language Acquisition Project have been entered and stored on computers for automatic analysis and inspection.

The Technical Group also collaborated with two other institutions. Together with the Technische Hogeschool Eindhoven a study has been carried out to determine the feasibility of real-time word recognition on the basis of FB-coding. The necessary special purpose hardware is now being built. In a study together with the HT Groningen, an attempt was made to design a general purpose language for preparing and running real-time experiments.

5. Teaching

The institute's staff taught courses of varying duration at the following universities:

Institute of Foreign Languages of Peking and Xian (Hickmann), Inter-University Centre Dubrovnik (Bowerman), Katholieke Hogeschool Tilburg (Zwitsersloot), Medizinische Hochschule Lübeck (Levelt), University of Brussels (Deutsch, Friederici, Levelt), University of California (Dryer), University of Frankfurt (Klein), University of Hamburg (Berkele, Weissenborn), University of Helsinki (Dahl), University of München (Günther), University of Nijmegen (Vonk), University of Oxford (Romaine), University of Peking (Hickmann, Weissenborn)

6. Lectures and Colloquia

A number of colloquia were organized by the institute's Colloquium Committee (Hickmann and Zwitsersloot till July, Ehrich and Weeks):

G. Altmann, J. v.d. Auwera, A. Banfield, R. Cromer, M. Dryer, D.J. Foss, K.I. Forster, L. Frazier, J.E. Gombert, Y. Grodzinsky, J. Groenendijk, T. Hoekstra, P.N. Johnson-Laird, E. Keenan, B. Maassen, D. Massaro, A. Mills, K. Rayner, G. Senft, M. Stokhoff, M. Taft, A. Timberlake, P. Warren,
John J. Gumperz together with Jenny Cook-Gumperz

(University of California at Berkeley) gave the 1985 Nijmegen Lectures from May 20-24. The lectures covered various topics in sociolinguistics including:

- An introduction to interactional sociolinguistics
- Culture and inference
- Interethnic communication
- Literacy and classroom environment

Gumperz also participated in several discussions with members of Dutch and German universities and also with researchers involved in the ESF project. The 1985 Nijmegen Lectures were organized in cooperation with the Interfaculty Unit for Language and Speech of the Catholic University Nijmegen by Romaine, Münstermann and Weltens.

7. Conference and Workshop Papers Presented

G. Altmann, "The resolution of local syntactic ambiguity by the human sentence processing mechanism", Second Conference of the European Chapter of the Association for Computational Linguistics, Geneva, March.

- "Modularity and interaction in sentence processing", Workshop on Modularity in Knowledge Representation and Natural Language Processing, Amherst, June.
- "Syntactic ambiguity, reference, and ATNs", Workshop on Computational Models of Language Processing, Bielefeld, October.

G. Altmann and A. Johnstone, "Automated speech recognition: A framework for research", Second Conference of the European Chapter of the Association for Computational Linguistics, Geneva, March.

J. Bayer, "Adjazenz und Kettenbildung: Bemerkungen zur Syntax der deutschen Gradpartikeln", presented to the group "Generative Grammatik im Süden", Konstanz, October.

- "German particles in a modular grammar: Neurolinguistic evidence", Partikelsymposium, University of Groningen,

December.

- J. Bayer, R. de Bleser and C. Dronsek, "Zur Verarbeitung von Kasusmarkierungen bei Aphasie", 12th Annual Meeting of the "Arbeitsgemeinschaft für Aphasieforschung und -therapie", Rotterdam, November.
- R. de Bleser and J. Bayer, "Lexikalische Morphologie und Tiefendyslexie: eine Fallbesprechung", 12th Annual Meeting of the "Arbeitsgemeinschaft für Aphasieforschung und -therapie", Rotterdam, November.
- L. Blomert, "Verbale communicatieve vaardigheden van afasiepatiënten", ANELA-studiedag, Nijmegen, October.
- L. Blomert, Ch. Koster, H. v. Mier and M.-L. Kean, "De Alledaagse Taalvaardigheids Test", 12th Annual Meeting of the "Arbeitsgemeinschaft für Aphasieforschung und -therapie", Rotterdam, November.
- "De Alledaagse Taalvaardigheids Test", Congres Nederlandse Vereniging voor Neuropsychologie, Nijmegen, December.
- M. Bowerman, "The role of semantics in language acquisition", Workshop on Perspectivas Actuales en la Psicología Cognitiva, Madrid, March.
- Discussant paper, Symposium on Deriving Language from Speech, Society for Research in Child Development, Toronto, April.
 - Discussant paper, Symposium on Mechanisms of Language Acquisition (20th Annual Carnegie-Symposium on Cognition), Carnegie-Mellon University, Pittsburgh, May.
 - "Finding the connections between language universals and language development: Some things to keep in mind about interpreting acquisition data", Workshop on Language Universals and Language Acquisition, Max-Planck-Institut, Nijmegen, August.
 - "Conceptual structuring and children's spontaneous spatial errors: Links with Universal Grammar", Language Acquisition Research Seminar, University of Utrecht, September.
 - "The spatial metaphor: A universal principle of semantic

- structuring? Clues from children's speech errors", Colloquium, Medical Research Council Cognitive Development Unit, London, September.
- "The role of semantics in language acquisition", Colloquium, Oxford University, September.
 - "The spatial metaphor: A universal principle of semantic structuring? Clues from children's speech errors", Colloquium, University of Manchester, September.
 - "The role of semantics in language acquisition," Keynote address, British Psychological Society Developmental Psychology Section Annual Conference, Belfast, September.
 - "The role of semantics in language acquisition", Themadag 'Taalontwikkeling' (Theme day 'Language Acquisition'), Katholieke Hogeschool, Tilburg, October.
- O. Dahl, "The interpretation of bound pronouns", Scandinavian Conference of Computational Linguistics, Helsinki, December.
- W. Deutsch, "Besitz im Spiegel des Spracherwerbs", Kolloquium an der Technischen Universität Braunschweig, February.
- "From gesture to word and gesture", ZIF-Kolloquium, Bielefeld April.
 - "Representation and access of linguistic gender in Dutch", ZIF-Workshop on word recognition, Bielefeld, May.
 - "Zeigen und Sprechen in der Entwicklung des Kindes", Kolloquium des Psychologischen Institutes der Universität Osnabrück, June.
 - "It is useful to say more than necessary", Conference on "Common Processes in Speaking, Listening, Reading, and Writing", Zentrum für interdisziplinäre Forschung, Universität Bielefeld, July.
 - "Besitz im Spiegel des Spracherwerbs", 7. Tagung der Fachgruppe Entwicklungspsychologie, Trier, September.
- C. Dronsek, R. de Bleser and J. Bayer, "Grammatische versus semantische Störungen beim Zusammensetzen einfacher Sätze: eine Replikation und Revision von v. Stockert und Bader (1976)", 12th Annual Meeting of the "Arbeitsgemeinschaft für

- Aphasieforschung und -therapie", Rotterdam, November.
- M.S. Dryer, "Universals of negative position", Symposium in Milwaukee, USA, April.
- "The branching direction theory of word order correlations", Max-Planck-Institut, Nijmegen, June.
 - "Principles governing noun-modifier order", Max-Planck-Institut, Nijmegen, July.
 - "Object-verb order and adjective-noun order: Dispelling a myth", Linguistic Society of America Annual Meeting, Seattle, USA, December.
- J. Edwards, "Two applications of computers to second language research", Second Language Research Forum, Los Angeles, February.
- V. Ehrich, "The semantics and pragmatics of temporal anaphora", International Conference on Pragmatics, Viareggio, Italy, September.
- "Hypothesen zur Entwicklung der Temporalbegriffe und Tempusformen in der Kindersprache", 7. Tagung der Fachgruppe Entwicklungspsychologie, Trier, September.
- P. Eling, "Lateraaliteit: een nieuwe interpretatie van links-rechts verschillen", Symposium "Neurologische Aspecten van Leerstoornissen", Nijmegen, March.
- "The production of morphologically complex words", Conference on Grammatical Processing in Aphasia: Cross-linguistic Studies, Royaumont, March.
 - "Ontwikkeling van lateraaliteit", Symposium "Ontwikkeling Hersenen en Cognitieve Functies", Utrecht, May.
 - Recognition of Derivations in Broca's Aphasics. Eighth European INS Conference, Copenhagen, June.
 - "Herkenning van morfologisch complexe woorden", Symposium "Psycholinguïstiek en Taalstoornissen", Nijmegen, November.
- P. Eling and H. Kremlin, "Visual analysis in word recognition; effects of side of lesion", Workshop Laterality effects in Acquired Reading and Writing Disorders, St. Ode(B), June.
- G.B. Flores d'Arcais, "Language comprehension", Workshop on

- Psycholinguistics, University of Padova, January.
- "Language perception" and "Language comprehension", University of Pavia, March.
 - "Language comprehension models", University of Bergamo, May.
 - "Semantic activation in word and object recognition", 4. Congress of the Experimental Psychology Division of the Italian Psychological Association, Ravello, October.
 - "Semantic activation during object naming", First Congress of the European Society for Cognitive Psychology, Nijmegen, September.
- U.H. Frauenfelder, "The role of linguistic structure in word recognition", Deutsche Gesellschaft für Sprachwissenschaft, Hamburg, February.
- "Word frequency effects in lexical access", 27. Tagung experimentell arbeitender Psychologen, Wuppertal, March-April.
 - "Access to- and the structure of- the mental lexicon", ZIF-workshop on Word Recognition, Bielefeld, May.
- L. Frazier, "Modularity in sentence processing", University of Amsterdam, April.
- "On parsing explanations of language universals", Max-Planck-Institut, Nijmegen, March.
 - "LF: A psycholinguistic perspective", Conference on LF and Mental Representation, Great Windsor Park, April.
 - "Syntactic processing--evidence from Dutch", Max-Planck-Institut, Nijmegen, May.
- A.D. Friederici, "Processes and strategies in syntactic parsing: Cross-linguistic studies are a double bind", Conference on Grammatical Processing in Aphasia: Cross-linguistic Studies, Royaumont, March.
- "Perzeption und Repräsentation: Über die Entwicklung der mentalen Darstellungen von Sprache und Raum", 7. Tagung der Fachgruppe Entwicklungspsychologie, Trier, September.
 - "Sprachliche und kognitive Faktoren im Verstehensprozeß: Entwicklung und Gebrauch", Wissenschaftliches Kolloquium des

Fachbereiches Psychologie, Universität Gießen, December.

- H. Günther, "Was the alphabet discovered or invented? On the alleged common processes in speech and writing", International conference "Graphematics and Orthography", Siegen, August.
- P. Hagoort and C. Heeschen, "Zum Kongruenzeffekt im Sprachverstehen und in der Sprachproduktion von Agrammatikern", 12th Annual Meeting of the "Arbeitsgemeinschaft für Aphasieforschung und -therapie", Rotterdam, November.
- J.A. Hawkins, "On explaining language universals", Conference on Language Universals, NIAS, Wassenaar, January.
- "On explaining some left-right asymmetries in syntactic and morphological universals", Keynote address, Milwaukee-Wisconsin Symposium on Language Typology and Universals, Milwaukee, March.
 - "Universal predictions for (first and second) language acquisition", Workshop on Language Universals and Language Acquisition, Max-Planck-Institut, Nijmegen, August.
 - "Language universals in relation to acquisition and change: a tribute to Roman Jakobson", First International Roman Jakobson Conference, New York University, October.
 - "Some left-right asymmetries in language universals and their causes", Department of Linguistics, University of California at Los Angeles, November.
- C. Heeschen, "A comparison between agrammatism and paragrammatism", Contribution as formal discussant for the session on paragrammatism at the Third European Workshop on Cognitive Neuropsychology, Bressanone, January.
- "The notion of "conventionality" of an expression in cross-linguistic research on aphasia", Conference on Grammatical Processing in Aphasia: Cross-Linguistic Studies, Royaumont, March.
 - "Ontdekken van grammaticale stoornissen bij afasiepatiënten", Congres Nederlandse Vereniging voor

- Neuropsychologie, Nijmegen, December.
- C. Heeschen, B.P.M. Schulte, A. Keyser and H. Kolk, "Agrammatism in aphasia as a protective mechanism", XIIIth World Congress of Neurology, Hamburg, September.
- M. Hickmann, "The development of discourse cohesion: a cross-linguistic perspective. 8th Biennial Meeting of the International Society for the Study of Behavioral Development, Tours, France, July.
- "L'ontogénèse de la cohésion référentielle du discours dans une perspective fonctionnelle. Workshop on "L'Emploi des Marques Temporelles et Aspectuelles", Laboratoire de Psychologie, Université de Dijon, France, November.
- L.G.M. Hustinx and W. Vonk, "Selectieve verwerking van informatie uit tekst". Achtste Minisymposium over Lezen, K.U. Nijmegen, April.
- G. Kempen and W.J.M. Levelt, "Mens en computer als taalgebruiker", Symposium on Informatica: Instrument bij het Onderzoek, The Hague, May.
- W. Klein, "The unity of a vernacular", Workshop "Methods of Sociolinguistic Description and explanation", FU, Berlin, April.
- "Second language acquisition in social context", University of Pavia, April.
 - "Thematic Structure of Utterances", University of Pavia, April.
 - "Ellipse and thematischer Stand", Universität Bielefeld, June.
 - "Thesen zur Sprachlehrforschung", Kolloquium "Sprachlehrforschung und Zweitspracherwerb", Universität Bochum, November.
- W. Klein and C. Perdue, "The learner's problem of arranging words I and II", University of Southern California, Los Angeles, February.
- H. Kolk and C. Heeschen, "Agrammatism vs. paragrammatism: a shift of behavioral control", Annual meeting of the Academy of Aphasia, Pittsburgh, October.

- W.J.M. Levelt, "Issues of lexical access in language production", Workshop on Language Processing, CSLI, Stanford, June.
- D.G. MacKay, "Sequencing and timing in skilled behavior", Psychology Department, Marburg University, June.
- "Sequencing and timing in the perception and production of speech", Psychology Department, Saarbrücken University, May.
 - "Sequencing and timing in the perception and production of speech", Conference on Common Processes in Reading, Writing, Listening, and Speaking, Bielefeld, July.
 - "Self-inhibition and the disruptive effects of feedback on skilled behavior", 26. Annual Meeting of the Psychonomic Society, Boston, Mass., November.
- W.D. Marslen-Wilson, "The concept of "on-line" and the normal model", Conference on Grammatical Processing in Aphasia: Cross-linguistic Studies, Royaumont, March.
- "Issues in spoken word-recognition", ZIF-Workshop on word recognition, Bielefeld, May.
 - "Processes in spoken word-recognition", Workshop on Language Processing, CSLI, Stanford, June.
 - "Information and decision in the perception of spoken language", Second Annual Conference of the British Psychological Society, Cognitive Section, Oxford, September.
 - "Aspects of human speech understanding", SERC-CREST course on Computer Speech Processing, Cambridge, September.
 - "Psycholinguistic evidence for massively parallel processing in spoken word-recognition", Workshop on Computational Models of Language Processing, Bielefeld, October.
- W.D. Marslen-Wilson and L.-K. Tyler, "Against modularity", Workshop on Modularity in Knowledge Representation and Natural Language Processing, Amherst, June.
- W.D. Marslen-Wilson, C. Brown and E. Bach, "Clause-final verb-clusters in German and Dutch: A psycholinguistic study", 27. Tagung experimentell arbeitender Psychologen, Wuppertal, March-April.

- Th. Pechmann, "Incremental speech production: Do we begin speaking before knowing what we are going to say?", Instituut voor Experimentele Psychologie, Rijksuniversiteit Groningen, February.
- C. Perdue, "Progress in the ESF project on second language acquisition by adult immigrants", TESOL France, Paris, March.
- G. Redeker, "Perspektive und Strukturierung in Filmbeschreibungen", 27. Tagung experimentell arbeitender Psychologen, Wuppertal, March-April.
- "References to story characters in interactive and non-interactive narration", International Conference on Pragmatics, Viareggio, Italy, September.
- J. Roche, "Native speakers' accommodation strategies towards L2 learners in naturalistic settings", Modern Language Centre Colloquium, The Ontario Institute for Studies in Education, Toronto, November.
- S. Romaine, "Children's acquisition of communicative competence". Colloquium, Universität Giessen, February.
- "Syntactic variation and children's acquisition of relative clauses", Third Scandinavian Symposium on Syntactic Variation, University of Stockholm, May.
 - "The syntax and semantics of the code-mixed compound verb in Panjabi/English bilingual discourse", Linguistics Society of America Summer Meeting, Georgetown University, Washington D.C., July.
 - "Code-switching in Panjabi/English bilingual discourse", Australian Linguistics Society Annual Meeting, University of Queensland, Brisbane, August.
- P. Schneider and M. Gearhart, "Interaction studies of parents and mentally retarded children: Is mothers' behavior adaptive or maladaptive?", Sixth Symposium on Research in Child Language Disorders, University of Wisconsin-Madison, June.
- D. Slobin, "The use of crosslinguistic data as a research tool

- in developmental psycholinguistics", Keynote address, Conference on Grammatical Processing in Aphasia: Cross-linguistic Studies, Royaumont, March.
- "Universal semantic hierarchies and acquisition", MPI Workshop on Language Universals and Language Acquisition, Max-Planck-Institut, Nijmegen, August.
 - "Developmental paths between form and meaning: crosslinguistic and diachronic perspectives", Keynote address, Tenth Annual Boston University Conference on Child Language, October.
- A. Timberlake, "Metalanguage (Categorial Grammar and Typology)", Conference on Typology, Moscow, December.
- W. Vonk, "Het effect van het lezersperspectief: een encoding phenomeen?", University of Groningen, November.
- "Selectieve verwerking van relevante informatie uit tekst", Onderwijs Research Dagen 1985, T.H. Twente, May.
- W. Vonk and L.G.M. Noordman, "Het leesproces vanuit psycholinguïstisch perspectief", Symposium "Speerpunt: lezen", K.H. Tilburg, December.
- L.A. Weeks, "Children and the formal features of television: A new perspective", 27. Tagung experimentell arbeitender Psychologen, Wuppertal, March-April.
- "Studying children's learning about the representational system of television: Problems and potentials. 8th Biennial Meeting of the International Society for the Study of Behavioral Development, Tours, France, July.
- J. Weissenborn, "Two problems in language acquisition: The absence of negative evidence and late errors", Chulalongkorn University, Bangkok, June.
- P. Wittenburg, "Überlegungen und Tests zum Einsatz von DBMS in lexikalen Datenbanken", Meeting of the Computer-Specialists of the Max-Planck-Gesellschaft, Frankfurt, November.
- P. Zwitserlood "Satzkontexteffekte beim Prozess der auditiven Worterkennung", 27. Tagung experimentell arbeitender Psychologen, Wuppertal, March-April.

- "Activation of word candidates during spoken word recognition", IPO Colloquium Serie, Eindhoven, May.
- "The recognition of spoken words in sentence contexts", ZIF-Workshop on Word Recognition, Bielefeld, May.
- "Activatie van woordcandidaten tijdens het woordherkenningsproces", Taalkunde colloquium, K.U. Nijmegen, November.
- "Activation of word-candidates during spoken-word recognition", 26. Annual Meeting of the Psychonomic Society, Boston, Mass., November.
- "The recognition of spoken words", Cognitive Psychology/Linguistics Colloquium, University of Amherst at Massachusetts, November.

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- Deutsch, W. and F. Wijnen: The article's noun and the noun's article: explorations into the representation and access of linguistic gender in Dutch. Linguistics 23(5), 793-810 (1985).
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- Dryer, M.S.: Tlingit: An object-initial language? Canadian Journal of Linguistics 30, 1-14 (1985).
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