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PREFACE

In 1983 the Institute saw further development of its major long-term projects on production, comprehension, acquisition, and disorders of language. It also saw the start of a new shorter-term project on language universals. Although the former projects were marked by continuity, unexpected coalitions of interest arose between researchers in different projects. One such point of crystalization was the issue of "dealing with trouble in language", which was also the title of the Institute's 1983 workshop. How do speakers cope with situations in which what they say differs from what they intended? These situations arise quite frequently in the speech of normal adults, second language users, children, and aphasics. The speaker's reaction to trouble is often at least as important a determinant of overt performance as is the underlying trouble, and there is great systematicity in how speakers cope with errors or inability.

Another major link between different projects was the issue of lexical access. This was a central theme in much of the Institute's comprehension research in normal adults, children, and aphasic patients, and it was also studied in speech production tasks with both normals and aphasics. The special focus of attention was the real-time accessing of lexical items of different structural classes.

The new project on language universals, which is run jointly with the Netherlands Institute for Advanced Study, involves an interdisciplinary team of visitors and staff in search of explanatory principles for selected linguistic and processing universals.

Willem J.M. Levelt

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RESEARCH IN PROGRESS

1. LANGUAGE PRODUCTION

Research of the production group has concentrated in the past year, as in previous years, on the interaction of various components of the production system. In particular, studies have investigated aspects of the self-repair of speech errors, the relationship between focus and intonation, deictic reference, and the accessing of lexical items in speech production.

1.1 Speech Repairs

1.1.1 Repairs and Prosody

Levelt and Cutler completed their analyses of the prosody of self-repairs in spatial network descriptions (see Annual Report, 1982). The investigation concerned the speaker's prosodic marking of corrections, i.e., whether he makes the prosody of the repair noticeably different from that of the original utterance. Further, if the repair is prosodically marked, does the prosody indicate where the fault lies and how it is to be corrected? Prosodic marking turned out to show no relationship at all to the syntactic characteristics of the repair. For instance, it was not used to signal to the listener the point in the original interrupted utterance to which the repair was returning. Instead, marking was strictly associated with certain semantic factors: repairs were marked when the original utterance had been actually erroneous rather than simply less appropriate than the repair, and repairs were marked more often when the set of items encompassing the error and the repair was small than when it was large. These findings lend weight to the characterization of accent as essentially semantic in function.

In another study Levelt showed that one can "repair" repairs without loss of prosodic naturalness by splicing out the redundant part - for example, the segment between slashes in the following repair: "a black straight line upwards with /a purple ball or no sorry/ a gray ball". The production apparatus apparently keeps certain parameters of continuation in abeyance while the trouble is edited out.

Levelt is studying developmental aspects of self-repair with an experiment in which 47 children, ranging in age from 5 to 11 years, did the same spatial network description task that had been used for the study of adults' spontaneous self-repairs. A sample of more than 1000 tape-recorded repairs was obtained, and by the end of the year each repair had been computer-coded according to the system developed for the adult self-repairs. The corpus is now ready for analysis.

1.1.2 Repairs and Feedback

Redeker pursued her dissertation project on the effects of feedback (auditory vs. none) and familiarity of listener (friend vs. stranger) in descriptive discourse, investigating self-corrections, comments and the structure and use of referential expressions in her American English data.

1.2 Focus and Intonation

1.2.1 Focus in Elliptical Expressions

Klein continued his earlier work on the interrelation of ellipsis rules, focus structure, and intonation. Two interim results are reported here.

(1) Klein's previous studies had shown that the tensed element (FIN) of a sentence plays a crucial role in the formulation of ellipsis rules in German. Briefly, all contextually given elements in a sentence can be omitted if FIN drops. In contrast to all other ellipsis rules, this rule is mandatory; that is, if FIN is dropped, all other possibly elliptical elements must be dropped too. It appears that this is a consequence of a more general principle which may be stated as follows: If FIN drops, only focus constituents can be left behind. Hence it seems that in German, only the presence of FIN allows a topic-focus organization of sentence structure.

(2) In a study of the intonation and semantics of focus (see Annual Report, 1982) Klein and von Stechow (University of Constance) developed an account of focus structure roughly along the following lines. In a syntactic structure, any constituent may be marked as focal; all other constituents belong to the topic. This results in a focus structure (F-structure) that functions as input to a set of intonation rules. A given F-structure is only compatible with one given 'state of discussion', which it then elaborates. This account is unsatisfactory in at least one respect: there are utterances in which all information is new with respect to a given state of discussion and utterances in which nothing is new (echo-questions or echo-statements); however, analysis of the prosodic structure shows that these utterances also have focussed constituents. A partial solution is as follows. For a given F-structure, the state of discussion only fixes F*, where F* is an arbitrary constituent that dominates F. That is, the context only determines a "focus domain" within which the speaker may select a focus constituent. Since intonation operates on F, but ellipsis on F*, some asymmetries between prosodically non-prominent and omissable parts can be easily accounted for. This solution is incomplete, however, in that

it does not solve problems of focus in echo questions.

In the broader context of his studies on ellipsis in German, Klein also analyzed one of the oldest psycholinguistic conceptions of ellipsis: Bühler's treatment in his 'Sprachtheorie' (1934). In accordance with general Gestalt psychological principles, Bühler assumed that all utterances are embedded in various 'Umfelder' (environments). In the case of ellipsis - Bühler termed it 'so-called ellipsis' - the normal linguistic 'Umfeld' is replaced by what Bühler labeled 'syntaktisches Umfeld' (syntactic environment) and 'symphysisches Umfeld' (perceptual environment). It is shown that this treatment does not account for the syntactic and semantic constraints which govern the form of elliptical utterances in German, including Bühler's own examples. Still, Bühler was probably the first to recognize the problem and to advance a consistent, even though ultimately unsatisfactory, solution.

1.2.2   Intonation of Focussed Noun Phrases

Tropf did a pilot study based on the account of intonation and semantics of focus in German developed by Klein (see Annual Report 1982). The intonational realization of an NP - or part of an NP - was analysed when this NP was in focus. The location of the focus on a particular NP within a sentence can be predetermined by asking subjects a question about the person/object mentioned in the relevant NP. In the answer, focus and the questioned NP (or part of the NP) coincide automatically. In preconstructed question-answer sequences the following factors were varied: position of the focussed NP in the sentence (initial, central, final), syntactic function (subject, object, AdvP), complexity of NP ((Det)(Adj) N (Adv)), and segmental structure (number of syllables; voiced vs. unvoiced). It appeared that if the focus is in central or

final sentence position, then its center - i.e., the stressed syllable-coincides with the end of the last main fall of the whole contour. The remainder of the contour stays on an even low level. The contour before the main fall varies on grounds which are still to be determined. If the center of the focus forms the beginning of the answer, the contour starts on the highest level followed by the main fall.

1.3 Reference and Deixis

1.3.1 Gesture and Speech

Levelt, Richardson, and Lahey completed their study of how, in deictic expressions, the temporal interdependency of speech and pointing gesture is realized in the course of motor planning and execution. Two theoretical positions were compared. On the "interactive" view, the temporal parameters of speech and gesture are claimed to be the result of feedback between the two systems throughout the phases of motor planning and execution. The alternative "autonomy" view, in contrast, predicts that the two systems are independent during the phase of motor execution, with the temporal parameters having been pre-established in the planning phase. In four experiments subjects were requested to indicate which of an array of referent lights was momentarily illuminated by pointing to the light and/or by using a deictic expression ("this/that light"). The temporal and spatial course of the pointing movement was automatically registered by means of a Selspot opto-electric system. By analyzing the moments of gesture initiation and apex, and relating them to the moments of speech onset, it was possible to show that, for deictic expressions, the autonomy view is very nearly correct.

1.3.2 Language and Space

Perceptual and functional conditions for the use of "left/right", "in front of/behind", and "above/below" were analyzed in a theoretical study by Levelt. Deictic use of these terms, i.e., use relative to ego's perspective, turns out to have the properties of converseness (e.g., A is to the left of B if and only if B is to the right of A) and transitivity (e.g., if A is to the left of B, and B is to the left of C, then A is to the left of C). Neither of these properties hold for intrinsic use, where spatial terms are interpreted relative to the intrinsic orientation of the referent objects themselves. Local transitivity, for instance, is violated in the following situation, where A is on B's left, B is on C's left, but A is on C's right:
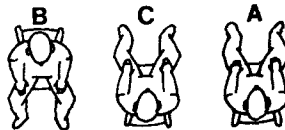
It was shown, moreover, that there are hitherto unrecognized perceptual restrictions on intrinsic use. The referent object in question has to be in 'canonical position' with respect to the dimension invoked by the preposition (e.g., front/back for the use of "in front of"). For example, something cannot be termed intrinsically 'in front of' a chair that is tumbled over backwards. Levelt terms this the "principle of canonical orientation".

1.3.3 Temporal Deixis

Ehrich started two new projects, both still in progress. One is on planning units in syntactic processing (together with Reis, University of Cologne) and the other is on temporal deixis. Data collection has been completed for the second project. Twenty German-speaking subjects were interviewed and

asked to give several kinds of temporal accounts (e.g., their biography; a description of the normal course of their day; a description of an accident). Data will be analyzed for interactions between tense, temporal adverbs, and conjunctions.

1.4 Lexicalization

1.4.1 Incremental Strategy of Object Naming

How does a subject access his mental lexicon and select a particular entry when he is asked to describe a picture? Pechmann's work centers around the notion of 'incremental strategy of object naming', according to which a speaker sometimes starts an object description before he has fully determined which nonlinguistic information has to be incorporated into the utterance. This nonlinguistic infor-mation is then fully decided on while the speaker already articulates the first parts of the utterance. Empirical support for such an incremental strategy comes from an experiment in which subjects' eye movements and speech production were both registered. Establishing unambiguous reference to a target object in the context of other potential referents requires that the speaker identify those features of the target that unequivocally distinguish it from all contextual alternatives. The data show that the subjects often started to produce their utterance before they had scanned the relevant domain of objects enough to be able to determine the distinguishing features. The visual scanning process took place concurrently with speech production.

If speakers use an incremental strategy of object naming, this might account for certain other empirical findings: (1) the fact that speakers often produce overspecified descriptions, i.e., object descriptions that include both distinguishing and nondistinguishing features of the target object; (2) The fact that distinguishing information is often

not stressed; (3) The fact that children's object descriptions are less often overspecified than those of adults, as has repeatedly been reported in the literature. In this connection, a second study showed that children scan all relevant objects significantly more often than adults before starting to produce their utterance. Assuming that an incremental strategy frequently leads to the production of overspecified utterances, children who are less likely to follow such a strategy should also be less likely to produce overspecified object descriptions.

1.4.2 Markedness in Speech Production

From various experimental paradigms in language comprehension research it is known that semantically unmarked comparatives (e.g., "bigger") are processed faster than their marked antonyms (e.g., "smaller"). In a series of experiments Schriefers investigated whether unmarked forms also have an advantage in language production. The typical picture-sentence verification task format was changed into a production task. Subjects were presented with pictures of two geometric figures which were either identical or different in overall size (experiment 1) or in height (experiment 2). Subjects had to say whether the figure marked by a star was "bigger" or "smaller" (or "taller" or "shorter") than the other figure. There were two presentation conditions: a POST-condition in which first the two figures appeared on the display and then after a delay of 1.5 seconds one of the two figures was marked by a star, and a PRE-condition in which the order of presentation was reversed. The RTs patterned in the same way in both experiments: responses using the unmarked comparatives were faster than responses using marked comparatives. Although this was true for both the PRE- and POST-conditions, RTs under the POST-condition were shorter than RTs under the PRE-condition, showing that subjects are able to profit from

perceptual preprocessing of the stimuli. Taken together, these results show that the advantage of unmarked over marked comparatives cannot be reduced to purely perceptual processes.

A control experiment showed that the results of experiments 1 and 2 cannot be explained in terms of differences in the articulatory difficulty of the comparative forms. Two further experiments, using the same paradigm but varying the size of the figures, showed further that the findings of the first two experiments cannot be explained as due to a congruency effect between the absolute size of the figures and the responses to be given. Rather, congruency and markedness appeared to be two independent (and additive) variables. If the experimental situation reduces the influence of congruency (as in the POST-condition), there remains a main effect of semantic markedness. In summary, this series of experiments shows that effects of semantic markedness show up in production. The most likely location of these effects in the course of sentence production is in the lexicalization process.

1.5 Other Research

Bock, in collaboration with Eling and Levelt, began an investigation of relationships among alternative forms of Dutch passive and dative sentences. Certain properties of Dutch passives, including their flexible constituent order and their explicit marking of the dynamic/stative contrast, permit tests of hypotheses about the roles of phrase structure elaboration and phrase ordering operations in sentence production. These hypotheses are being examined with a syntactic priming paradigm in which subjects produce sentences in particular syntactic forms before describing pictured events.

The final months of 1983 saw a substantial effort in the
development of ways to measure psychological processes at work
during the process of speaking. This work (by Levelt,
Richardson and others) is still in its pilot phase, and there
are as yet no noteworthy results to be reported.

2. COMPREHENSION

A core concern of the comprehension group is how people process spoken or written language so as to derive meaning from it. Research of the past year has investigated how words are recognized, including how they are isolated from the speech wave and how their recognition is affected by the syntactic or semantic context in which they occur and by their part-of-speech membership; how prosody affects sentence comprehension; and how readers draw inferences from texts.

The second focus of the comprehension group is on theoretical accounts of language structure. This work includes efforts both to formulate optimal grammatical descriptions of given phenomena and to determine the processing consequences of structures with properties that are interesting on theoretical grounds.

The third major theme - which also has links to both production and acquisition research - has been language universals, as determined by the typological study of word order patterns and other properties in languages of the world. Work has centered on identifying universals, determining their causes (one important class of possibilities is processing factors involving either the speaker or the listener), and the relationship between language universals and language development.

2.1 Word Recognition

Many studies have been conducted on the lexical processes involved in word recognition. These can be grouped according to when and where the processes under investigation occur in the course of identifying words: (1) studies of the low-level

processes that take the speech wave as input and generate the representations that in turn are used in accessing the mental lexicon; (2) the psycholinguistic processes involved in lexical accessing itself; (3) the effects of aspects of the structure and organization of the lexicon on word recognition; (4) the interface in word recognition between the lexicon and higher order contextual constraints. Studies testing the "cohort model" fall under both (2) and (4), but are presented together for convenience as a separate group.

2.1.1 Processing the Speech Wave

Since joining the Max-Planck staff in February, Frauenfelder has pursued his interest in the temporal and informational characteristics of word recognition processes. By integrating phonetic and psycholinguistic appoaches to the study of these processes, he is working toward deriving a psychologically more unified picture of speech perception and word recognition. More specifically, research is directed at determining: (1) when decisions about the contents of the acoustic input are made (immediately or after a delay); (2) what kinds of decisions are made (categorical or continuous); and (3) what the relative contribution is to these decision processes of different information sources (phonotactic, lexical, syntactic, and semantic).

Hypotheses about the time course of decision processes in word recognition range from those postulating continuous and immediate decisions to those positing delayed decisions taken at intervals of a syllable or more. To investigate the size of the temporal window during which acoustic information is integrated, subjects were asked to decide as quickly as possible whether an auditory stimulus matched a previously presented visual word. Mismatch detection times for nonwords created by distorting the target words in 2 places (a 3

distinctive feature distortion followed 2 phonemes later by a second 2 d.f. distortion) were compared with reaction times to matched items having only the first distortion. Preliminary results show that the second distortion no longer affected the mismatch detections, which indicates that the analysis process proceeds rapidly from left-to-right. Further experiments which vary the amount of distortion and the distance separating the distortions are planned to investigate whether the window size depends upon how easily and clearly the decision can be made.

Frauenfelder is collaborating with McClelland (UCSD) on another set of experiments designed to explore the categorial character of the decision process. Some models, called categorical, assume a deterministic left-to-right phonemic analysis of the speech signal, while others, called continuous, allow multiple phonemic candidates to be activated simultaneously. One test of categorical versus continuous models involves measuring the semantic activation of mispronounced words (e.g., "rospital" for "hospital"). According to categorial models, the inappropriate phoneme of the mispronounced word (the r in "rospital") should immediately eliminate the intended word ("hospital") from the pool of active words candidates. Consequently, in contrast to the predictions of the continuous models, the meaning of the intended word would never be activated. These models were tested with a cross-modal naming task. Subjects were asked to name a visually presented word ("doctor") immediately after hearing a semantically related mispronounced word ("rospital"). If the subjects' naming times were faster than those for an unrelated auditory word, the non-categorial models would be supported.

Gee and Grosjean investigated the role of prosodic structure in processing the speech wave. They ran a series of pilot studies to test the hypothesis that the "phonological word" (a stressed content word together with its associated

unstressed function words) is central to the process of lexical access, in the sense that the processor first extracts phonological words from the speech stream, then decomposes them, and finally accesses the content word, while using various recognition procedures (perhaps partly based on phonetic "templates") to identify strings of function words (which may be phonologically reduced). In addition, the investigators wanted to test the idea that the stressed syllable is a "key" into the lexicon. The pilot studies indicated that prosodic patterns of strong and weak syllables influence the process of lexical access and that the phonotactics of strings of syllables may be used as a guide to the placement of phonological word boundaries, thus speeding up or slowing down the lexical access process.

2.1.2 Nature of the Lexical Accessing Process

In collaboration with Marcus (IPO, Eindhoven), Frauenfelder is developing a new methodology to determine the relative contribution to word recognition of different information sources and the interaction between them. The approach involves introducing a range of distortions (from subphonemic to phonemic) into the acoustic signal by means of resynthesis techniques. The perceptual cost of these distortions on decisions at a variety of levels (phonetic and lexical) will be measured as a function of the different informational constraints available. Research conducted thus far has investigated how lexical representations affect lower-level decisions - in particular, the effect of knowledge of the left to right lexical structure on phonetic decisions. Initial results indicate that timed phonetic decisions ([b] or [d]) on initial sounds (ranging along an 11-step continuum from a word like "dokter" to a nonword like "bokter") are facilitated by this lexical knowledge. In fact, phonetic decisions were made more quickly when the lexical information

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indicating which of the two choices ([b] in the above case) leads to a nonword becomes available early. These preliminary results from on-line procedures strengthen similar findings Frauenfelder obtained in off-line experiments conducted in collaboration with Elman (UCSD), Ganong (Kurzweil) and McClelland (UCSD).

Frauenfelder is also currently constructing a database of digitized words to be presented on-line by computer to subjects in a variety of tasks. The words were selected by means of an exhaustive search of a computerized Dutch dictionary to test a number of precise hypotheses about auditory word recognition. One hypothesis concerns the role of word frequency in auditory word recognition. While frequency is known to play an essential role in visual word recognition, it has not received much attention in the auditory modality. Two experiments in progress will establish whether a word frequency effect exists, and should provide an explanation for this effect in terms of differences in relative levels of activation of words of unequal frequencies.

Flores d'Arcais, together with Schreuder and Glazenborg (Leiden), has investigated the activation of two components of the semantic representation of words: perceptually based information (physical attributes such as form or color of the object referred to by the word) and conceptually based information (more abstract elements such as functional attributes). An earlier series of experiments had showed an independent contribution of these components to semantic priming (see Annual Report, 1982). The results also indicated possible differences in the temporal activation of the two components: the contribution of the perceptual component was stronger in a word naming task, while the contribution of the conceptual component was stronger in a lexical decision task, which requires more time than word naming. Flores d'Arcais and his colleagues have postulated that the perceptually based

component is activated earlier than the conceptually based one, and suggested that this differential availability could be related to differences between the two tasks. To test this hypothesis they ran further experiments in which they tried to slow down word naming (by use of visually degraded stimuli) and to speed up lexical decision (by training or by use of phonologically illegal strings as nonwords). If the hypothesis were correct, there should be a stronger effect of the perceptual component in lexical decision and a stronger effect of the conceptual component in word naming. The experiment with delayed word naming yielded very clear results in the predicted direction, while the results of the speeded-up lexical decision task were less clear-cut, although also significantly in the predicted direction.

Colombo has studied how priming with strings that rhyme with a target word affects performance on visual lexical decision tasks. In one study, Colombo found that recognition of target words preceded by a physically similar (rhyme) prime (word or nonword), like "fog-dog" and "rog-dog", is slower than recognition of the same word preceded by a control (neutral or unrelated) prime, e.g., "bet-dog". These findings contrast with findings by other authors, in which recognition of targets preceded by orthographically similar primes was facilitated. Colombo conducted a study comparing performance on target words vs. nonwords to test the hypothesis that the delay in recognizing target words with rhyming primes may stem from inhibition for physically similar lexical units produced when the prime word is accessed in the mental lexicon. The results supported the hypothesis: only target words were inhibited, while target nonwords were facilitated with respect to the control.

2.1.3 Structure and Organization of the Lexicon

Several researchers have explored possible differences between open and closed class words in word recognition tasks. Previous studies have suggested that open and closed class items may be retrieved from the mental lexicon differently, but results are not uniform. Friederici and Heeschen approached the problem by comparing accessing procedures for <u>inflected</u> open and closed class items. The German language allows these items to be compared directly since both are marked identically for number, case, and gender. The experiment used a lexical decision task in which stimuli were presented visually in either blocked or randomly mixed order. Different types of nonwords were included in order to explore retrieval processes in more detail. Results indicate that the hypothesized different access devices for open and closed class words cannot be described in terms of their sensitivity to frequency. Inflected open and closed class words behave similarly with respect to this factor in the recognition process. The findings suggest further that inflectional suffixes are recognized similarly regardless of whether they are attached to an open class, closed class, or nonword item. Recognition of the inflectional suffix does not seem to be affected by its frequency of occurrence. Open and closed class words are recognized equally fast when presented in mixed order. However, when they are presented in blocks, reaction times are faster for closed than for open class words. This suggests that if there are differences in accessing open and closed class elements, distinct retrieval mechanisms may only be activated when preceding information allows the subject to build up high expectations about the class membership of the incoming item. Under these conditions elements from the small set of the closed class may be recognized more quickly, since search procedures could be terminated faster in the closed than in the open class set.

In two lexical decision tasks related to those described above, Eling explored the recognition of morphologically complex words - i.e., those with derivational and inflectional affixes - in Dutch. The results suggest that decomposition does not play a role in the recognition of derivations, but it may with respect to inflections, especially those which can be considered 'regular'. In the next phase of this project Broca aphasics will be tested in order to investigate whether the problem these patients have with closed class items extends to different types of bound morphemes.

Flores d'Arcais has noted that the difference in availability of open and closed class items found in previous studies may be due less to grammatical class membership than to typical differences in meaningfulness: function words tend to be poorer in semantic content than content words. A series of experiments was conducted to test this hypothesis. One study used Dutch words from two grammatical classes - one open class (verbs) and one closed class (prepositions). The words selected had two distinct senses, one of which had been rated as "semantically rich" in a preliminary study and the other as "semantically poor". In a word naming task in which one of the two senses of the selected words was specified through sentence context, the rich sense of both open and closed class words was found to be accessed more easily. This indicates that meaningfulness is at least partially responsible for the differences previously found.

Deutsch, in cooperation with Wijnen (Utrecht), has started a new project on the representation and access of article-noun relations in Dutch. The theoretical starting point is a proposal by Maratsos and Chalkley (1980), who claimed that in some languages - German, for example - gender is not an inherent feature of a noun, but an abstraction that refers to a number of interrelated distributional patterns. Since neither the semantics nor the phonology of Dutch nouns predicts their

gender, it is assumed that the mental representation of noun
gender comprises associative networks in which groups of words
are linked to representations of distributional char-
acteristics. Within this framework, experiments have focussed
on two questions: How do native speakers of Dutch access the
correct forms of the definite article "de" or "het" under
different task conditions? What role in accessing is played by
the different frequency of "de" and "het"? In one task
('Article Assignment'), subjects listened to a set of common
monosyllabic nouns and indicated as rapidly as possible the
article belonging with each noun. In a second task ('Article
Recognition'), subjects judged whether auditorily presented
article-noun combinations showed gender agreement. RT was
measured. Results show reliable differences both between the
two tasks and between the two article forms. Article
assignment took at least 70 ms longer than article recognition.
This suggests that if the form of the article is not already
present in the stimulus, it is not automatically activated but
requires an extra processing step. The assignment and
recognition of the more frequent article form "de" was
remarkably faster than the assignment and recognition of "het".
This frequency effect was found even when the average frequency
of "de" and "het" nouns was balanced.

2.1.4   Interface between the Lexicon and Higher-Order
Contextual Constraints

When do the effects of semantic or syntactic context on
word recognition take place: before, during, or after the
process of recognition? According to a recent hypothesis, the
facilitation of lexical decision by semantic priming is due to
a post-lexical semantic integration process in which subjects
try to relate the meanings of context word and target word
after both have been recognized. It appears that the duration
of the response-selection stage in lexical decision can be

influenced by the outcome of the semantic integration process. However, it is not clear how semantic integration exerts its effect on response selection in this task. De Groot investigated the possibility that this effect reflects agreement or conflict between the outcome of semantic integration on the one hand and the required lexical-decision response on the other. The hypothesis tested was that when semantic relatedness between target and context is discovered, subjects are biased toward the correct 'yes' response; conversely, semantic unrelatedness biases toward an incorrect 'no' response. If these outcomes are available before the recognition of the target as a word has been translated into a correct 'yes' decision, they will speed up or slow down the decision, respectively. De Groot tested this hypothesis with an experiment designed to reverse conflict and agreement conditions by requiring 'no' responses for words and 'yes' responses for nonwords. The predicted reversal effects were not found, but the hypothesis cannot be rejected because subjects apparently were not translating recognition and nonrecognition into no/yes (or yes/no) responses after all. The results of a second experiment, designed to force this translation, have not yet been fully analyzed.

2.1.5 The Cohort Model

The cohort model of word recognition developed by Marslen-Wilson and Tyler claims that the recognition of a word in isolation is mediated by the parallel activation at the onset of the word of all the words the listener knows beginning with the same sound sequence. The word can be recognized as soon as it becomes uniquely distinguishable from the other words beginning with the same initial segment. Semantic and syntactic context plays a role in reducing the amount of sensory information needed for recognition beyond the initial activation, but it does not affect the cohort of words that is

initially activated.

Tyler has worked further in testing these claims about how
sensory and contextual constraints interact in the process of
recognizing spoken words. In one study she explored the
relative contribution of semantic vs. syntactic constraints in
reducing the amount of sensory input needed for recognition.
Using the 'gating' task procedure (see Annual Report, 1982),
she found that although obligatory syntactic constraints on
form-class only marginally reduced the amount of sensory input
needed for correct recognition of a word, a minimal
interpretative context facilitated word recognition
substantially. The results also supported the cohort model
with respect to the predictions it makes for the exact point in
a word at which the word should be recognized. An analysis was
also carried out on the words produced by subjects at each
gate, under the assumption that they constituted a subset of
the words currently active in the cohort. The word frequency,
syllable structure, and syntactic and semantic appropriateness
of words produced at each gate were analyzed to determine the
characteristics of the initial set of word candidates and the
ways in which they change over time as a function of contextual
constraints. A timed version of this experiment was also run.
In this task, subjects produced their word choices as rapidly
as possible and latencies were recorded. The results obtained
in this task were essentially the same as those obtained in the
non-timed task, indicating that the non-timed gating task is
sensitive to the properties of the on-line analysis of the
sensory input.

Marslen-Wilson, Tyler, and Brown completed analysis of the
"gating" data from their contextual anomaly experiment (see
Annual Report, 1982). The purpose of this aspect of the
experiment was to test directly the claim that words are
recognized in context before sufficient acoustic-phonetic
information has accumulated to allow them to be recognized on

that basis alone. The monitoring aspect of the experiment provided an estimate of on-line recognition time. The gating experiment provides estimates of the amount of purely sensory information needed for correct recognition, using as stimuli the same words as were used as targets in the monitoring task. The results confirm the original hypothesis: words are indeed responded to in context significantly faster than they could be responded to on the basis of sensory information alone.

Marslen-Wilson and Brown completed a series of experiments that tested the claim that many different word candidates are activated early in the process of hearing a word. Pairs of words were used that only deviated from each other relatively late in the word - for example, the pair "kapitein" and "kapitaal". Each subject heard one member of each pair, while simultaneously seeing a visual probe word that was semantically related to one or the other member of the pair. The prediction is that probes related to both members of the pair will be activated, irrespective of what the word will eventually become, so long as the visual probe is presented at a point in the word before it uniquely separates. For the pair given above, this should apply to probes placed on the /t/ or earlier. Results from a cross-modal lexical decision task, and from a novel task involving speeded relatedness judgments, confirmed this prediction. The picture is complicated, however, by the strong effects of word frequency. The visual probe that was most strongly primed at probe positions before the separation point was the probe associated with the more frequent member of the pair of spoken words, regardless of which of the two the word would eventually become.

Zwitserlood continued her dissertation research, which tests the claim of the cohort model that at early stages of the word recognition process word candidates are activated on the basis of the sensory input only and cannot be guided by contextual constraints. A series of on-line experiments

measured the activation of two word candidates: the target
word (the word actually presented) and a competitor (a word
belonging to the same initial cohort). The materials used in
the experiments were the same as those used in an earlier
gating study (see above and Annual Report, 1982). Two
fragments of each target word were presented auditorily in 3
context conditions: isolation, short context (short single
sentences), and long context (sentence pairs). The length of
the fragments was determined on the basis of the results from
the gating study. The sensory information contained in the
short fragment was insufficient for identification of the
target word, whereas in the long context only the target word
was still compatible with the sensory input. The experiments
used a cross-modal lexical decision task. Subjects listened to
the isolated fragments or to the sentences including the
fragments and had to make a lexical decision on a word that was
presented visually at the offset of the fragment. The word was
either related to the target word or to the competitor. The
relative frequency of the target word and the competitor was
varied. Results show that word frequency plays a role in the
amount of activation of word candidates at early stages of the
word recognition process: the higher frequency word candidate
is facilitated relative to the less frequent candidate in the
'short fragment' condition, where both candidates are
compatible with the sensory input. This effect holds for both
the short context condition, where both target and competitor
are contextually appropriate, and for the long context
condition, where only the target word meets contextual
requirements. These results indicate that, just as the cohort
model predicts, context does not serve to preselect only those
word candidates that meet syntactic and semantic constraints.
When enough of the sensory input is heard to exclude all word
candidates except the target word, it is always the target word
that is facilitated, independent of its relative frequency.

2.2 Prosody and Sentence Comprehension.

Wales analyzed data from an experiment on the interaction of prosody and modal verbs (such as "must" and "might") in the comprehension of English. Subjects listened to a variety of spoken sentences in which intonation and stress were systematically varied (e.g., with or without sentence-final rise or stress on the modal or main verb). Results showed that judgments of certainty, obligation and question/statement varied systematically both as a function of the modal verb and of the prosody. These judgments were then related to acoustic properties of the utterances (measures of pitch, intensity, and duration). It was found that the different acoustic signs contributed in different ways to judgments: "certainty" used information from the modal, main verb, and sentence-final intonation contour, and "ask/tell" predominantly from sentence-final intonation contour.

2.3 Text Comprehension

In collaboration with members of the Interfaculty Research Unit for Language and Speech at the University of Nijmegen (Noordman and Kempff), Vonk continued work on inference in text comprehension. An experiment was conducted in which an inference could be considered as an activation of available knowledge. That readers make this kind of inference was demonstrated by presenting subjects with a target sentence describing an action of a person, preceded in one condition but not the other by a sentence describing the role or profession of that person. The reading time for the target sentence was decreased significantly by the previous mention of the role of the actor. This difference in reading time was significantly greater in a condition in which the context preceding the role-specifying sentence (or its absence) could suggest more than one possible role for the actor than in a condition where

where this context was neutral. These results contrast with previous research by these researchers on causal inferences. The question in the earlier project was whether readers interpret the conjunction "because" as a signal to check whether the fact mentioned in the subordinate clause is or can be the cause of what is mentioned in the main clause. It appeared that this kind of inference is rarely made in normal, careful reading of popular scientific texts, although it increases when readers are instructed to read with a particular purpose (e.g., to check for inconsistency). The difference in results leads to the present hypothesis of the researchers that whether or not inferences are made in normal reading depends on the availability of knowledge.

Another project initiated by Vonk, together with the Interfaculty Research Unit and the Institute for Dutch Language and Literature at the University of Nijmegen (Noordman, Jaspers, and Spooren), studies the expression and function of oppositions and contrasts in written discourse. The aim is to give a linguistic analysis of the text characteristics and to investigate effects on the reader. A pilot experiment revealed that the order in which pro and con arguments are mentioned in a text affects the way in which the reader interprets the opinion of the writer. This effect is greater when the contrast is marked by linguistic means.

A further set of studies by Vonk investigated the impact of the goal of the reader on the encoding of text. Three stories were written containing sentences that had been considered by independent judges as relevant to a decision that readers would have to make right after reading the text. The texts contained paragraphs with three kinds of information: information relevant to a decision on a first topic, to a second topic, and neutral information. The stories themselves (e.g., about buying a birthday present for a friend) had no relation to the topics to be decided on (e.g., whether to apply

for information regarding a particular place to spend holidays). In one experiment subjects were instructed to read the story carefully in order to be able to make a decision on a specified topic and to make that decision immediately after reading each text. In a free recall task, administered twenty minutes after reading the text, subjects were instructed to reproduce the story as completely as possible. Which information was recalled depended significantly on the particular topic on which the reader had had to make a decision. In a subsequent experiment it appeared that reading times were significantly longer for sentences that were relevant to the topic on which the reader would have to make a decision than for those that were not. Consequently, the purpose of the reader affects both the encoding and the recall of the texts. Experiments are in progress to investigate which mechanisms are responsible for the longer encoding, and whether the better recall is (at least partly) due to that longer encoding.

A third set of experiments dealt with the on-line resolution of pronouns in sentences such as "Mary (Pete) lied to Ann because she (he) smelled trouble". Although it has been reported in the literature that the referent of the pronoun is identified faster when the sentence contains a gender cue (a male and a female person mentioned in the main clause) than when no gender cue is available (two persons of the same gender in the main clause), eye movement registration indicated that the duration of fixation on the pronoun was significantly longer when there was a gender cue than when there was not. On the other hand, the total duration of fixation on the remaining part of the second clause showed the reverse pattern. The results were interpreted in terms of a rational selection of information strategy and a qualified version of the immediacy claim.

2.4 Theoretical Work

Szabolsci worked on relating the results of two theoretical frameworks, Montague Grammar (MG) and the Government-Binding Theory (GB). She examined three specific issues: (1) the sentence-like syntax and semantics of the possessive construction in Hungarian; (2) an MG-type account of the mono- versus biclausal properties of infinitival structures, compared to a GB analysis relating Control and thematic role absorption; and (3) the motivation of the Empty Category Principle of GB in terms of function-argument structure, with specific reference to subject extraction and parasitic gaps.

Holmback completed a study of the so-called 'definiteness effect' in English in 'existential' there sentences, such as "There is a unicorn in the garden". In these sentences, indefinite descriptions can occur in the post-verbal noun phrase position without restriction, but definite descriptions have a quite limited distribution. For example, "There is the unicorn in the garden" on an 'existential' interpretation is unacceptable, as are most examples with definite descriptions. But some do occur, such as "There is the most beautiful unicorn I've ever seen in the garden". Holmback showed that no special syntactic or semantic rule or filter needs to be posited to account for the distribution of definite and indefinite descriptions in this sentence type. Rather, the distribution can be accounted for more simply and adequately by reference to independently-needed semantic properties of definites and indefinites combined with the semantic properties and discourse-based inferences that are associated with existential sentences. Holmback also proposed a solution that gives a unified linguistic representation of 'existential' there sentences and 'listing' there sentences, with the differences between them predicted by their discourse environments.

Theoretical syntacticians have recently been interested in the crossed serial dependencies found in complex sentences in Dutch. Marslen-Wilson, Brown, and Bach have begun research comparing the processing consequences of crossed serial dependencies vs. the more common pattern of nested serial dependencies as shown, e.g., by German. The first pair of experiments, still in progress, uses acceptability judgments to measure the relative difficulty that speakers of Dutch and German experience with increasingly long sequences of such dependencies.

2.5 Language Universals Project

1983 saw the beginning of a project entitled 'Explanation in Universal Grammar', devised originally by Hawkins and Dunlea (see Annual Report, 1982) and currently coordinated by Hawkins and Holmback. The project is run jointly with the Netherlands Institute for Advanced Study in the Humanities and Social Sciences (NIAS) at Wassenaar, and involves collaboration between invited fellows at NIAS and both guests and regular staff at the Institute. The project's goals are to search for explanations for the increasing body of language universals discovered by cross-language comparison, and to consider the predictions made by universals for language acquisition. Precise explanatory principles are being developed of different types (semantic, pragmatic, syntactic, and processing) and for specified grammatical areas. It is hoped that by involving researchers from these different areas of linguistics and psycholinguistics in the pursuit of common goals, the project can do justice to the richness of the causes that underlie the constraints on cross-language similarity and variation.

An initial meeting was held in August at the Institute for the 1983-84 participants in the project. It was attended by the NIAS fellows: Bybee (SUNY Buffalo), Hoekstra (Leiden),

König (Hannover), Kooij (Leiden), McKenzie (FU Amsterdam), Stassen (Nijmegen); by the MPI guests: Andersen (USC), E. Clark (Stanford), H. Clark (Stanford), Comrie (USC), Grosu (Tel Aviv), Slobin (Berkeley); by the MPI Universals Committee: Bowerman, Frauenfelder, Hawkins, Holmback, Levelt; and by other interested parties. Meetings since the initial one have included regular discussions by the NIAS fellows of their ongoing research, meetings of a Processing Group, which is investigating processing explanations for language universals, and of an Acquisition Group, which is exploring the predictions that can be made by language universals for errors and for the relative timing of acquisition of various linguistic subsystems in typologically diverse languages.

Hawkins' book Word Order Universals was published in 1983. This work draws on a sample of 350 languages, defines various types of universals of word order, and proposes some explanatory principles underlying them (see Annual Report, 1982). Hawkins has now used this language sample to compare the predictions made by two competing general models of phrase structure for word order: the categorial grammar model, in which constituents contract 'function-argument' relations, and models such as Chomsky's X-bar theory, which invoke the 'modifier-head' relation. It is argued that the latter approach lends itself more readily to an explanation of cross-language word order patterns.

Hawkins also continued an ongoing study of syntactic and morphological variation in the Germanic language family, with particular reference to English and German. The purpose of this comparison of what are probably the two best described languages in the world is to better understand the parameters of variation on all languages. The contrasts between English and German are claimed to be of interest for three reasons. First, they are very precise. There are exact, or nearly exact, proper subset relations between the structures of the

two languages in the many areas of grammar under investigation. Second, despite the relatively short time depth that separates English and German from their common West Germanic ancestor, there have been profound readjustments throughout the grammar: morphology, word order, grammatical relations, raising rules, extractions and deletions have all been affected in important ways, especially in the history of English. Third, it is argued that there are interesting semantic generalizations uniting the contrasts: English surface forms regularly exhibit less correspondence with their semantic representations in specifiable ways, given fairly standard assumptions about the nature of these two levels. It is suggested, further, that the loss of case inflections was responsible for many more of the syntactic and semantic changes in the history of English than is currently realized. Suggestive inferences and predictions are drawn from the English/German case study for hitherto unsuspected correlations between numerous properties in other languages.

Within the framework of the Universals Project Comrie investigated the interaction of grammatical factors and real-world knowledge in establishing referential networks within texts. Two main types of systems for encoding referential relationships are distinguished: syntactic and nonsyntactic. The syntactic system has strict syntactic rules delimiting possible coreferences, as seen in the English sentence "the man saw the woman and ran away", where a syntactic restriction on conjunction reduction requires that the subject of the second clause be interpreted as "the man". The nonsyntactic system has no such restriction, so that such sentences are in principle ambiguous (either the man or the woman ran away), as in Kalaw Lagaw Ya (Western Torres Strait, Australia). In languages that lack such a restriction, other aspects of the grammar (e.g., verb agreement) or real-world knowledge may in fact exclude one of the potentially available

interpretations. Comrie also worked on the universals of tense
systems.

Comrie and Holmback collaborated on a study of the future
subjunctive in Portugese. This form appears in certain types
of restrictive relative clauses and temporal clauses;   no
generalization unifying the two types of uses had heretofore
been suggested. Comrie and   Holmback   proposed   such   a
generalization, stated as a semantic property of the future
subjunctive. The future subjunctive shares the mood properties
of the present subjunctive, but it contrasts with the present
subjunctive not with respect to futurity but with respect to
greater definiteness or identifiability of event, situation,
reference, etc., predictable by the type of subordinate clause
in which it occurs.

Grosu continued his earlier work on the position of
sentence   complements   across   languages.   These   'heavy'
constituents frequently occupy different positions   in   a
sentence than do noncomplement NPs; in particular, they prefer
clause-final position. Processing theories provide suggestive,
although not unproblematic, explanations for this fact, which
Grosu is investigating. Grosu also worked on coordination,
exploring the properties of coordinations with heterofunctional
conjuncts,   their   possible   relationship   to   so-called
"nonconstituent coordinations", and parametric variation in
their properties across languages.   In   addition,   he
investigated cross-linguistic variation in the distribution of
pleonastic pronouns, and their possible   relationship   to
resumptive pronouns.

As a preliminary to a comparative survey of determiner
systems   across   languages, Holmback outlined the set of
referential functions that may be represented in languages   in
some morphological and syntactic form.   Absolute and im-
plicational universals concerning the expression of referential

properties   in   language are being investigated on the basis of
the distribution of these functions in different languages.

3 LANGUAGE ACQUISITION

Research of the language acquisition group is directed toward both first and second language development. Investigators studying first language acquisition have continued with work initiated previously, such as the development of discourse cohesion, the ability to express information about spatial and possessive relationships, the causes and implications of children's "late" speech errors, and the developmental relationship between cognitive and linguistic abilities. A number of new projects has also been initiated or brought to the Institute, including cross-linguistic work on the acquisition of specific linguistic subsystems, the "no negative evidence" problem, and the relationship of language acquisition to language change and to universals of language (on this last, see 2.5).

Research on second language acquisition has continued to focus on untutored learning by adults, with special attention in the past year to the influence of semantic distinctions marked by L1 on acquiring L2 structures which do not mark these distinctions; the pragmatic strategies used by learners to communicate when their linguistic means are still severely limited; phonological learning; the language input to learners; and the methodological and theoretical problems of trying to infer knowledge of a second language through the analysis of speech produced in communicative settings.

Although the specific projects on first and second language acquisition have been distinct, a number of shared interests unite members of the two subgroups: e.g., the role of the learner's own conceptual system (whether prelinguistic or as represented in L1) as it interacts with that of the language being learned (Bowerman, Deutsch, von Stutterheim),

the distinction between underlying knowledge and use of that knowledge (Klein, von Stutterheim, Weissenborn), and how learners modify their incorrect rules, especially in the absence of negative feedback (Bowerman, Klein).

3.1 First Language Acquisition

Research on first language acquisition is grouped under four topics: 'The development of discourse skills', 'The expression of spatial information', 'The acquisition of linguistic subsystems', and 'Language acquisition in a wider perspective: Links to cognitive development, linguistic theory, and language change'.

3.1.1 The Development of Discourse Skills

Hickmann (with Schneider, Northwestern University) continued her research on the development of discourse cohesion. She extended to 4-year-old children an earlier study in which she had compared English-speaking 7- and 10-year-olds' performance in different tasks involving stories that contained "disruptions" in linguistic cohesion (see Annual Report, 1982). Children heard narratives containing disruptions of various degrees in the sequences of coreferential expressions and were asked to retell these narratives to a naive listener, to judge them, or to repeat sentences in them. Preliminary analyses show that at all ages children repaired some disruptions when retelling stories - for example, introducing referents effectively when retelling stories which contained ineffective referent-introductions. However, the 4-year-olds made such repairs less often than the 7- and 10-year-olds during this task. In addition, with some stories the 7- and 10-year-olds were less accurate than the 4-year-olds during the repetition task because they repaired some ineffective cohesive devices more often, even though they

had been asked to repeat sentences verbatim. Only the 10-year-olds were able to give explicit metalinguistic statements about disruptions. The 7-year-olds rarely gave such judgments, although they could sometimes spot the disruptions and say how they should be repaired. The 4-year-olds, in contrast, did not detect the disruptions. These results suggest that some automatized ability to repair discourse cohesion is present and used in at least certain situations before the metalinguistic ability to talk about disruptions explicitly is fully developed. However, the further development of the ability to repair cohesion across tasks and materials may depend on the development of metalinguistic skills. Hickmann and Schneider piloted some continuations of this study which will compare children's performance with different types of disruptions in narrative cohesion.

Tyler's research focussed on how children integrate utterances with the preceding verbal context in on-line comprehension. In particular, she examined what kinds of information constrain children's interpretations. Children aged 5, 7 and 10 years heard short stories each with two major protagonists. Every story ended in a fragment with an anaphoric full NP or pronoun in subject position followed by a verb (e.g., "The fireman saved .../He saved ..."). The children's task was to continue the fragment. There were three sources of constraint on their interpretation of the fragment: the discourse, the verb meaning, and the form of the anaphor. All three either converged on a consistent interpretation or conflicted. There were four major findings: (1) When the discourse structure, the verb, and the anaphor were consistent with the same interpretation, children of all ages interpreted the fragment correctly. (2) When the subject pronoun was inconsistent with the discourse and the verb, 5- and 7-year-olds ignored the pronoun and gave a continuation consistent with the discourse and the verb, but inconsistent

with the pronoun. When the anaphor was a full NP, however, it was not overridden by any other source of information at any age. (3) When the verb was neutral and the discourse bias conflicted with the pronoun, the pronoun guided children's interpretations at all ages. (4) When discourse and verb were pitted against each other so that the subject anaphor was consistent with only one of them, children based their interpretations upon whatever two sources of information were consistent, with a tendency for the verb to be dominant. These results highlight the importance of verbs in the interpretation of utterances. Their syntactically and semantically defined argument frames provide the basis both for a structural analysis of the utterance and for pragmatic inferences that link it to the preceding discourse. The study shows that children as young as five are sensitive to these complex properties of verbs in their on-line comprehension of an utterance. The results also suggest that Karmiloff-Smith's 'thematic subject constraint' (see Annual Report, 1981) needs to be modified to allow a greater role for the verb in the interpretation of utterance-initial anaphoric pronouns.

Karmiloff-Smith continued her work on the development of discourse cohesion, initiating a new project involving two case studies of the language of children with rather severe handicaps in fields other than language. The language output of these children appeared to their teachers to be normal, but Karmiloff-Smith noted many problems in the use of cohesive devices in extended discourse.

Hoppe-Graff and Schöler, in cooperation with Deutsch and Weissenborn, continued their work on the development of story comprehension and story memory in preschool and elementary school children. Special emphasis was placed on (1) the construction of a model for the reproduction of simple stories and (2) the construction of a category system for rating the reproduction accuracy of simple stories.

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3.1.2 The Expression of Spatial Information

Two projects focussed on children's developing ability to encode spatial relations. In his ongoing project on route descriptions (see Annual Report, 1982), Weissenborn explored the relationship between the structure of verbal descriptions of macrospace (giving route directions) and the structure of the underlying spatial knowledge. He concluded that it is necessary to make a distinction between the knowledge itself and the ability to access it under various task conditions. This means that behaviors that Piaget and others have interpreted in terms of developmental changes in the (macro)spatial representations of children may instead reflect changes in modes of externalizing these representations. Comparative studies of the ontogenesis of different modes of representation (verbal, pictorial, constructional) will be necessary to clarify this issue.

Wales investigated the acquisition of deixis. In particular, he was concerned with the processes that take place between the early productive use of demonstratives with concomitant gestures and the much later ability to establish spatial contrasts without gestural support. He also explored the possibility that children attend not only to the spatial contrasts indexed by demonstratives but also to whether or not the referent is animate.

3.1.3 The Acquisition of Linguistic Subsystems

Weissenborn and Friederici (in cooperation with Kail, Paris) studied the role of input factors in the acquisition of the pronoun system. In a cross-linguistic investigation that compared French, English, and German, the following factors were varied systematically: (a) the phonological status of the pronoun (clitic/non-clitic); (b) semantic and morpho-syntactic factors (number, gender, and case); (c) syntactic factors

(pre-/postverbal position; prepositional/non-prepositional phrase); and (d) the total number of pronominalized object noun phrases. It was predicted that (1) across languages sentences with one pronominalized noun phrase are easier than those with two; (2) non-clitic pronouns are acquired earlier than clitic pronouns; (3) pronouns which mark their syntactic function by a prepositional phrase are mastered earlier than those which do not; (4) direct object pronouns are acquired before indirect object pronouns, if both forms have the same phonological status (i.e., clitic in French and non-clitic in German); (5) the French pronoun system, which is more complex than English and German with respect to these factors, presents the most difficulties during development. Results from a sentence-picture-matching task with 4-to-6-years-olds confirmed these expectations. A preliminary analysis of incorrect responses with respect to the morphological factors suggested that children made more errors when the distractor only deviated in number than when it deviated either in gender or in both number and gender. Thus it appears that the assumed factors indeed play a critical role in sentence comprehension. However, their exact role in the construction of the underlying linguistic knowledge in the child is still open to investigation.

Deutsch, in cooperation with Budwig (Berkeley), continued his project on 'Possessives in development'. Previous analyses (see Annual Report, 1982) showed that two children (Brown's Adam and Eve) constructed a form-function relationship that does not exist in the target language they were acquiring: they initially used their own names to refer to themselves as possessors in utterances functioning indicatively (to show or remark) and pronominal forms in utterances functioning volitionally (to request or retain a possessum). More recent work has focussed on adult speech to the children in the same transcripts used in the original study, to determine whether

there was a model in the input for such a system. An analysis
of the distribution of nominal and pronominal forms used to
refer to the child as possessor revealed that the adult input
to both children was similar, but that there were remarkable
differences between the children and the adults. The adults
consistently showed a clear preference for the pronominal form
and rarely used the nominal form. This means that the
developmental pattern of the children cannot be explained by
reference to the adult input. The discrepancies between
children and adults were not restricted to the form of
possessive constructions but also extended to their meaning and
function. While the children mainly used their own name to
mark alienable relationships, the adults consistently referred
to inalienable objects with the pronominal form; this was the
form that the children first used for alienable objects in the
volitional context. Furthermore, when an adult attempted to
correct the child's uninflected use of a name (e.g., "Adam
hat") by repeating the utterance with an inflection ("Adam's
hat"), the child would again repeat the uninflected form. The
children began to inflect names when they were used alone but
not when they were used with possessums. This could suggest
that children initially do not view possession in a unified
way, but rather make a distinction between the meanings or
functions of expressions like "Adam hat" and "That's Adam's".
These findings support the view that developmental changes in
the use of possessive constructions are child- rather than
adult-initiated.

Bowerman carried out a cross-linguistic study of the
acquisition of conditionals (if-then constructions and their
equivalents in other languages). The basic question asked was
why conditionals emerge late in children's spontaneous speech,
relative to other structurally similar complex sentence types.
The lateness of conditionals has often been attributed to
relative cognitive complexity. However, careful analysis of

the spontaneous speech of children who did not yet produce conditionals indicated that the conceptual notions needed for conditionals of a variety of types (e.g., uncertainty, hypotheticalness) are in place well before conditionals appear. Pragmatic explanations for lateness - e.g., conditionals are not "needed" at first because the functions they will fulfill are already being carried out by other construction types - were also not supported. These negative findings indicate that factors more subtle than those usually invoked must influence the timing of acquisition; their nature is not yet clear, however. An analysis of the semantics of children's early conditionals showed striking uniformity across languages (English, Turkish, Polish, Italian): the utterances were exclusively or predominantly future predictives (making reference to two future events, the consequent contingent on an uncertain but likely antecedent). The centrality of this meaning for children is echoed in the structure of natural languages: Comrie has argued that the expression of low hypotheticality with future reference is one of the most basic types of conditionals (e.g., most likely to receive formal marking across languages). The semantic analysis also revealed that a semantic system which, like that of English, draws a distinction on formal grounds between certain and uncertain antecedents in future predictives ("when" vs. "if" clauses, respectively) poses no problems for young learners. The three English-speaking subjects of the study were essentially perfect from the beginning in their ability to select the conjunction required on semantic grounds. These results suggest that young children approach the domain of conditionals with both a universal conceptual bias toward the expression of certain meanings and a remarkable sensitivity to the particular semantic contrasts drawn by the language being acquired.

Clark's research centered on the development of word-formation abilities. Children coin words - novel nouns, verbs, and adjectives - from an early age. Like adults they do this to fill gaps in their vocabulary. But, just as with syntax or phonology, children take time to discover what options are available for forming new words and how to use them appropriately. For the last three years Clark has been collecting and analyzing both spontaneous and elicited coinages in order to uncover some of the acquisitional principles children rely on as they build up a repertoire of word-formation devices. She has now started writing a monograph to present these findings and consider their implications for theories of acquisition and of word-formation.

3.1.4 Language Acquisition in a Wider Perspective: Links to
       Cognitive Development, Linguistic Theory, and
       Language Change

Karmiloff-Smith continued her work on the comparison of linguistic and nonlinguistic cognitive development. In previous years the comparison was made between linguistic and other symbolic systems, and last year between the production of narratives and principles in physics. This year the work was extended to the area of spatial cognition. This culminated in a chapter in which Karmiloff-Smith pulled into a single framework all her experiments in language, physics, and space.

Bowerman has extended her work on children's late errors (see Annual Report, 1982) to explore the "no negative evidence" problem, a logical puzzle which has recently been invoked by a number of linguists who favor postulating strict innate constraints on the kind of grammars children can construct - and hence on the grammatical models linguists should entertain. It is widely agreed that children receive little information about what is not a possible sentence of their language. But

negative evidence would appear to be necessary to prevent
learners from formulating overly general grammatical rules -
i.e., rules that generate all the relevant acceptable sentences
of the language and err only in that they also generate
ill-formed sentences. This problem has motivated many
linguists to propose that children are in fact constrained in
such a way that they do not hypothesize overly general rules
that could not be corrected on the basis of positive evidence
alone. A variety of hypotheses about the nature of these
constraints, and about the models of grammar that best capture
them, have been put forward. Bowerman found that many of the
generalizations that such constraints are designed to block are
in fact made by children, as is evidenced by the types of late
errors they produce (e.g., shifted datives, passives, and
lexical causatives with verbs that do not allow these
constructions). Bowerman considered some possible scenarios
for how children could cut back on their incorrect
generalizations in the absence of negative feedback. She
concluded that although no proposal is at present fully
satisfactory, the fact that children do make the errors and
somehow eventually stop making them means that the no negative
evidence problem cannot be invoked to justify the postulation
of innate constraints.

Since joining the Institute staff in September, Romaine
has continued her anthropological linguistic work, which fo-
cusses on how the study of language acquisition, language
contact, language mixing, and the restructuring, emergence and
collapse of linguistic systems can contribute to a more general
theory of language development and change. One ongoing
project, based in Birmingham, England and funded by the Social
Science Research Council, is "Language Loss and Maintenance in
a Multi-ethnic Community". This is a sociolinguistic case
study of the language skills of Panjabi-speaking Sikh and
Muslim families in India and in England. The aims of the

project are to determine (1) the present range of language skills and patterns of language use; (2) to what extent certain languages are used in particular situations for specific purposes; (3) whether there is a shift taking place in language choice patterns, especially amongst the younger generation; and (4) what the attitudes of the community are to changing patterns of language use and maintenance. Romaine has also initiated a sociolinguistic project to study first language acquisition, creolization, and language change in Tok Pisin, spoken in Papua New Guinea. Both of these projects look at the spread and adaptation of languages to their social and cultural environment in order to identify general sociolinguistic processes of change, particularly in relation to the effects of urbanization on patterns of language use and acquisition. Further work by Romaine is directed toward integrating the fields of sociolinguistics and historical linguistics. In this area she has, among other projects, been developing a socio-historical approach to the study of word formation and morphology.

3.2   Second Language Acquisition

3.2.1   ESF Project

The Institute provides the central coordination for the research project "Second Language Acquisition by Adult Immigrants". This project is funded by the European Science Foundation, headed by Klein and Allwood (University of Göteborg) and coordinated by Perdue. Its purpose is to describe the process of spontaneous second language acquisition by forty adult immigrants in five countries (England, Federal Republic of Germany, France, Netherlands, Sweden), and to isolate the various factors that determine the structural properties and tempo of this process. The study is cross-linguistic, with ten different source language(SL)/target

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

Data collection for the longitudinal study was at about the half-way point at the end of 1983. It is organized into three nine-month cycles, such that (1) similar topics and activities are initiated with informants of all the SL-TL pairs at roughly the same time; and (2) each of these topics and activities is repeated three times during the longitudinal study for each informant. Complete longitudinal data should be available for an already selected "core" group of four informants per SL-TL pair at the end of the field work in early 1985.

Progress has been made this year through the efforts of Edwards, in collaboration with Perdue and Klein, in preparing the data for analysis. In particular, Edwards has (1) revised data entry procedures to make them faster; (2) identified and begun implementation of the three main computer algorithms needed for the data analysis phase of the project; and (3) addressed team-specific needs, including linkage to local main-frame computers, identification of appropriate local software, and the coding of data for specific theoretical concerns. Exhaustive analysis of the data is scheduled for 1985-86. However, cross-linguistic pilot analyses involving computer-stored data from some informants have been set up for the following research topics: misunderstanding and repair in interactions between learners and native speakers; learners' organization of utterances in selected tasks; spatial reference; and strategies for conveying lexical meaning. These analyses, whose primary aim is to define categories for

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subsequent coding in the full analysis, will be completed in 1984.

3.2.2 Acquisition of German by Guest Workers

Research by several investigators centered on guest workers learning German as a second language. Von Stutterheim continued her dissertation study on the expression of temporal reference in German by Turkish workers. She completed a detailed analysis of ten learner languages using the theoretical framework of the 'conceptual approach'. Acquisition and use of L2 were studied separately. Two examples will serve to illustrate the role of conceptual organization as represented in L1 in the process of acquiring L2; in both cases, learners productively adapt and combine elements from L2 to express conceptual distinctions that are obligatory in L1 but not marked in L2.

1. The first opposition in the verbal system of the Turkish learners is of an aspectual nature: a marked form is used for durative/habitual meanings and an unmarked form for all others. The opposition is expressed by the two forms 'aux + inf' and 'inf', e.g.:

    "ich bin machen Töpfe" (habitual event)

    "ich Unfall machen" (singular event)

2. The Turkish tense system distinguishes between two categories of past reference: past and remote past. These conceptual categories can be found in the learner language systematically expressed by adverbial means:

    "früher" or "vorher" (before)

    "ganz früher" or "ganz vorher" (long before)

Von Stutterheim's analyses of temporal organization in language use gave insights into the interplay among lexical, syntactic, and pragmatic expressive means. Two examples are given to illustrate how restricted learner languages establish

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temporal cohesion by pragmatic means when the necessary lexical or syntactic means have not yet been acquired:

1. In learner languages with neither tense forms nor temporal conjunctions, temporal cohesion in discourse has to be inferred from the specific aspectual properties of the verb or verb phrase. The distinction of main importance is between utterances that include a temporal 'boundary' and utterances that are open with respect to temporal evaluation. The former carries the reference point on to the next utterance (sequence of events) whereas the latter maintains the reference point or frame for the following utterance (temporal embedding or simultaneousness).
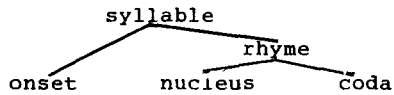
2. The deletion of the subject or the temporal component (or both) in an utterance indicates a specific type of referential coherence between two or more utterances. The elliptical utterance maintains the temporal reference established in the preceding non-elliptical utterance. This strategy leads to a pattern which subdivides discourse into 'referential blocks'. The utterances within a 'referential block' share the major referential constituents: person, time, and in most cases also place. Shift of the referential domain can be indicated by all three of the components mentioned above.

Tropf finished his dissertation on variation in the phonology of untutored learners of German as a second language. The data base of this study consists of narrow phonetic transcriptions of interviews with Spanish guest workers. To analyze the data, Tropf wrote a general-purpose computer program for comparative phonological investigations which is based on the concept of binary phonological features. With this program all realizations in the interlanguage corpora that correspond to phonological patterns of the target language can be found. Tropf studied the relation between the variation in the phonological output and the structure of the corresponding internal representation. The patterns of variation showed that

the syllable is the most important phonological unit in the acquisition of a second phonological system. The degree of difficulty in acquiring consonants and consonant clusters strongly correlates with the following idealized (nearly) universal syllable structure:

Linear structure: Plosive-Fricative-Nasal-Liquid-Glide-Vowel-
Glide-Liquid-Nasal-Fricative-Plosive.

Hierarchical structure:

```
                        syllable
                      /        \
                              rhyme
                             /     \
        onset       nucleus        coda
```

In general, vowels are acquired fairly easily. Single consonants are acquired more easily if they correspond to a position near the nucleus of the universal syllable structure. Similarly, a consonant cluster is acquired relatively easily if it coincides with the universal syllable structure. This clear relevance of the syllable as a phonological domain was the basis for some proposals on how the syllable should be integrated in a psychologically plausible model of the phonological component of a generative grammar. A further finding of the study was that age and degree of contact with native speakers correlate strongly with phonological development, but duration of stay does not.

Roche continued his work on features of "foreigner talk" in German – that is, the way in which native speakers of German speak to non-native speakers. 130 conversations between native speakers of German and either Italian or Turkish guest workers were recorded in naturalistic settings. The recordings include data from eight German speakers in conversation with five to seven different addressees each (including a German control person), which allows comparison of addressee-specific speech adjustments. Tentative results indicate the co-existence of a wide range of different adjustment strategies (e.g., structural

reductions, lexical simplifications, slowed speech rate). Their realization depends on the speaker's own preferences, the addressee's linguistic level, and - apparently - also the addressee's extralinguistic characteristics. The most striking finding, however, is the overall tendency of every German speaker not to stay in a special foreigner register. Only temporary adjustments are made, after which the speaker tries to switch back to normal colloquial speech or dialect. An important issue still to be investigated is what impact foreigner talk may have on the acquisition of German as a second language.

3.2.3 Rule Learning versus Communication

Klein's research has been concerned with the relationship between rule acquisition and communication in second language learning. Most serious and ecologically valid studies of second language acquisition are based on the analysis of language in use, that is, of learner varieties when applied for communicative purposes. Although this has indeed been a fruitful approach, it also may have some drawbacks. In a methodological paper, Klein discusses this problem, and makes the following three proposals: (1) In studying language acquisition, we should distinguish between learning processes and the rules that govern them, on the one hand, and communication processes and the rules that govern them, on the other. (2) The rules a learner entertains at a given time may have different degrees of subjective confirmation. He may base his language processing at that time on rules which for him are only weakly confirmed or even false, and he may not apply rules which he considers to be correct or at least good candidates for the rules to be learned. (3) All more-or-less confirmed rules must be checked, or else learning stops. But this is not done for all rules simultaneously; rather, at any given moment only a subset of the learner's hypothetical rules are <u>critical</u>,

that is, sensitive to checking and revision. It is argued that these hypotheses, if true, allow for a straightforward solution to the logical puzzle of how learners correct their grammars in the absence of negative evidence.

4 LANGUAGE DISORDERS

In 1982 the ZWO project 'Aphasia in Adults' on psycholinguistic aspects of language processing in aphasics got underway. In the first phase of the project a considerable amount of time and effort had to be devoted to contacting and testing new patients in order to set up a suitable pool of subjects for running experiments. In 1983, the project's second year, attention was mainly directed to the experiments as they are described in the ZWO proposal. The central aim of the project is to use well-attested psycholinguistic paradigms to investigate a number of central issues in the area of aphasic disorders. One such issue concerns the demarcation of the classes of content and function words and the nature of the difficulty certain types of aphasic patients have with function words. A second topic is whether pragmatic abilities are pre-served in aphasics. A third area of investigation is how aphasics process syntactic structure. A common thread running throughout research in these areas is to determine more precisely the nature of the differences among different types of aphasia.

4.1 Open and Closed Class Elements

4.1.1 Comprehension of Pronouns

Patients with Broca's aphasia, in particular thos with agrammatism, are said to have trouble processing function words or closed class elements. Previous studies have suggested that not all closed class items cause processing problems; rather, items that carry lexical-semantic information in addition to structural information are still partly processed by agrammatics on the basis of the former information. To explore

this possibility further, Friederici and Weissenborn (in collaboration with Kail, Paris) investigated the comprehension of personal pronouns in a sentence-picture-matching task that varied number, gender, and case as well as the total number of pronominalized elements (see also Weissenborn, Friederici and Kail, 3.1.3). The experiment, which has not yet been completed, also includes a cross-linguistic (German/French) comparison. Preliminary results from German-speaking Broca's and Wernicke's aphasics allow the following tentative conclusions: although both groups of patients processed pronouns relatively well (70% correct for Broca's and 63% correct for Wernicke's), Broca patients had far more difficulty than Wernicke patients in comprehending these elements when the number of pronominalized elements per sentence increased. Gender - here semantic gender - was controlled much better than number information by Broca's aphasics. Wernicke patients did not show a clear difference between the two types of information. Broca patients demonstrated a particular problem with case-ambiguous pronominal forms (i.e., forms with more than one syntactic function), even though the pictures which were presented together with the sentences always disambiguated the pronominal form.

The findings so far seem to support the hypothesis that Broca's aphasics process the structural and the lexical-semantic information carried by closed class items differently. Ongoing cross-linguistic comparative work is designed to determine whether other factors - for example, the phonological status of the closed class element - play an additional role in agrammatics' difficulties in exploiting all the information carried by pronouns.

4.1.2 Open and Closed Class Elements: Two Basic Categories?

It has become increasingly clear through work of Friederici and Heeschen that the boundary between open and closed class items cannot be set simply by intuitive appeal to the distinction between 'content' and 'function' but rather requires consideration of 'function' word semantics and syllabicity. In order to further delimit the boundary between these classes in general, and to be able to explore their differential breakdown in aphasia in particular, Kean set up an experiment to study the processing of specific 'open' and 'closed' class categories in restricted syntactic configurations. The experiment compares exemplars from each class in minimal pairs of sentences using a word monitoring paradigm. The results of an English pilot study suggest that these two basic categories are of no processing significance in sentence understanding. Specifically: (1) cases were found in which there was no significant difference in processing latencies across categories from the two classes (nouns were not significantly different from prepositions and quantifiers were not significantly different from verbs); and (2) there were significant differences within each class (verbs were different from nouns and adjectives and determiners were different from prepositions and quantifiers). These data suggest that there is no aphasiological deficit that can be described in terms of one a loss of 'closed' class items (as is typically argued for Broca's aphasia) or a selective retention of control of the 'closed' class (as has occasionally been suggested for Wernicke's aphasia).

4.2 Pragmatic Processing

The second core theme of the project is whether pragmatic abilities are preserved in aphasics. In particular, investigations have focussed on whether the distribution of

"given" and "new" information or "topic" and "comment" is
normal in aphasic speech despite potentially severe formal
deficiencies. Extensive pilot work by Heeschen and Hagoort
showed that tasks of a "question-answering" type were
particularly sensitive to this type of variable. Subjects were
presented with a picture in which somebody (X) does something
to somebody else (Y). The Dutch subjects were asked either of
the following three questions:
(a) Wat doet X? (What is X doing?)
(b) Wat gebeurt er met Y? (What is happening to Y?)
(c) Wat wordt er met Y gedaan? (what is being done to Y?)
Answers of normal subjects to the "doet"-questions were almost
100% canonical actives (e.g., "the boy kisses the girl").
Answers to the "gebeurt"-questions were 40% passives ("the girl
is kissed by the boy") and 40% so-called lexical passives ("the
girl gets a kiss"), with the remaining 20% consisting of
various construction types. The "wordt gedaan"-questions,
which explicitly model the passive construction, elicited
almost 100% passives in normal subjects. Agrammatic (n = 9)
and paragrammatic patients (n = 7) reacted differentially to
the different questions, but not with an increase of passives,
as in normals, but rather with a decrease of actives.

Inspection of the answers showed that the agrammatics
produced approximately 50% formally complete and completely
correct answers regardless of the construction type they used
and irrespective of whether the construction of the answer was
appropriate to the question. This indicates that they could
not be 'tricked' into using constructions that they were less
well able to produce than canonical active sentences. The
agrammatics produced another type of answer that testified
dramatically to the tendency to sacrifice pragmatic adequacy of
constructional type for grammatical correctness: sheer
confabulations with respect to the main features of the picture
and with respect to the question asked (e.g., "the girl is

nice"). 21 of the 24 confabulations were grammatically complete and completely correct.

The paragrammatics also responded differentially to the different types of questions. However, they produced more passives than the agrammatics in the "wordt gedaan"-condition. The pattern of grammatical errors also differed from that of the agrammatics: the likelihood of producing a completely correct answer increased with the pragmatic adequacy of the answer (thus, only 17% of the lexical passives as [inadequate] answers to the "wordt gedaan"-question were correct, while 60% of the lexical passives as [adequate] answers to "gebeurt"-questions were correct). While the results from the agrammatics lend themselves to interpretation within the framework of some sort of adaptation theory, the paragrammatics' behaviour cannot be unambiguously interpreted for the time being.

4.3 Syntactic Processing

4.3.1 Comma Placement

One current theory of agrammatism holds that agrammatics are unable to make use of functional elements (grammatical words, case endings, etc.) in order to construct the syntactic frame of a sentence. To test this hypothesis Heeschen conducted an experiment in which German-speaking patients were presented with complex sentences consisting of a subordinate clause and a main clause. Their task was to insert commas at the appropriate places. (Comma placement is regulated on a strictly syntactic basis in German). In the crucial condition, 'Jabberwocky', all lexical elements were replaced by nonwords while grammatical elements (including endings) were retained, e.g.:

1. als die punte den utz gefratzelt hatte burte der mies mit

dem rutlich.

2. die latzin gurrte in den minder weil den jaden der brich
   pitte.

   Both agrammatics (n = 8) and paragrammatics (n = 7) made
an enormous number of errors. There was no significant
difference between the groups. However, their errors were
highly systematic. In items like (1) the comma was
predominantly placed after the potential main verb form, here
"gefratzelt". In items like (2) the comma was predominantly
inserted immediately before the potential grammatical subject,
here "den Jaden". Both strategies serve to isolate the
canonical German main clause, which can be represented as
follows: Subject - finite verb - X - (non-finite verb). These
results are remarkable for two reasons: (1) Isolation of a
potential main clause requires much more grammatical knowledge
than the correct placement of the commas would have required.
Thus, the supposed 'agrammatics' performed in an
'over-grammatic' fashion! (2) Isolation of the main clause is
more than might be expected from agrammatics, but less than
might be expected from paragrammatics, given current theories
which hold that agrammatism is a syntactic disturbance whereas
paragrammatism is a purely lexical disturbance. Both groups
appeared to have a substantial syntactic deficit, and,
conversely, a substantial amount of grammar left intact.

4.3.2 Word Order in Passives

   Friederici and Graetz followed up an earlier investigation
of agrammatics' ability to process structural information (see
Annual Report, 1982, Friederici and Kolk). The previous study
had shown that agrammatic and paragrammatic patients perform
very similarly in an off-line, time-unrestricted comprehension
task. The data were interpreted as reflecting the use of
similar strategies rather than as evidence for a shared

underlying deficit. Results from this study led the investigators to hypothesize that although there are a number of similar strategies used in the two aphasic groups, differences can also be found, especially in the processing of passive sentences. While paragrammatic patients tended to follow an agent-first strategy, agrammatic patients seemed to use an additional strategy which took some surface form cues into account: "In a passive sentence assign the noun after the preposition 'by' the role of agent". In order to test the different strategies used for comprehension in the two aphasic groups, an experiment was designed that focussed on the understanding of passive sentences. Dutch allows relatively free word order, which means that semantically reversible passive sentences could be presented in seven different word orders (three agent-first and four patient-first sentence types). In all seven word order types, order of the elements in the prepositional 'by' phrase was held constant. Eight agrammatic and eight paragrammatic patients were tested in a sentence-picture-matching task. The two aphasic groups clearly followed different patterns of performance, which supports the assumptions outlined above. The findings indicate that the agrammatics, who seem to have lost the ability to automatically process closed class elements, nevertheless recognize that these elements mark some structure; they are, however, unable to use the information for correct structural assignment. In contrast, paragrammatics, who seem to have retained the capacity for automatic syntactic processing, revert to some very general strategies when automatic processes alone do not allow successful comprehension.

4.3.3 Grammaticality Judgments

Traditional grammaticality judgment tasks only require subjects to give a judgment of well-formedness. However, it is important to know not only whether a subject thinks a particular sentence is correct, but also whether he has interpreted it correctly. For this purpose Kean has developed a probe/judgment task in which subjects are asked both to give a grammaticality judgment and to paraphrase the sentence. Pilot studies with English materials showed that different groups of subjects make very similar judgments but do show systematic variation when asked to paraphrase the sentences. This work may be extended to aphasics in the future.

4.4 Other Research

4.4.1 On-line Comprehension

Tyler has been developing a processing profile for aphasic patients. A picture of each patient's language processing system is built up by testing with various on-line and off-line tasks. So far, experimental tests have been devised to probe patients' performance in some of the principle categories of on-line language comprehension, including lexical, syntactic and semantic processing. Data from the individual experiments making up the processing profile are combined for groups of patients falling into the major syndrome categories. This classification is done on the basis of the Boston Aphasia Exam or the Aachen Test and (wherever possible) neurological data. This approach both allows individual patients to be studied in depth and performance to be compared between and within groups. In addition, it allows evaluation of the extent to which patients falling into one of the various diagnostic categories perform similarly on a variety of comprehension tests.

Preliminary work to test the feasibility of probing the on-line language processing system of aphasics shows that on-line tasks developed for use with normals can be successfully adapted for use with patients. Over 35 patients (English and Dutch) have been tested on a variety of tasks that require the patient to make fast responses to specific target items. All but the most severe Wernicke patients had no trouble performing reliably. Reaction-times were usually in the normal range, but occasionally a little longer (the importance of absolute differences in RT can be reduced by building into a study the appropriate experimental contrasts). The data obtained so far indicate the advantages of developing a processing profile for each patient, and suggest that patients clustering together on the basis of aphasia test batteries perform consistently on some tests of on-line language processing.

4.4.2 Cooperation with the Max-Planck-Institute for Neuro-logical Research, Cologne (Prof. W.-D. Heiss) has led to a new research project. Blomert will perform neuropsychological and neurolinguistic studies on patients that are investigated in Cologne with the PET-scan. Due to technical limitations this work is still in a preliminary phase.

4.4.3 Possibilities for performing cross-linguistic studies of aphasia were discussed during a visit by Bates to the Institute. The proposed work includes experiments in sentence comprehension and production under various contextual conditions, as well as collections of free speech, for three types of aphasic patients (agrammatic Broca's, paragrammatic Wernicke's, and anomic aphasics). Speakers of several different languages would be studied, including English (a strong word order language), Italian (a weak word order language), Hungarian (a strong case-inflected language), and

Serbo-Croatian (a weak case-inflected language). A group of
Spanish-English bilingual aphasics in the Southern California
area would also be included.

OTHER ACTIVITIES 1983

5.1 Activities of the Technical Group

As in previous years the Institute's technical group was mainly concerned with assisting in the running of experiments and preparing special set-ups, and with developing the appropriate electronic modules and software. A major focus of the group was the Vax system. The Vax system now receives intensive use in the Institute. As a consequence certain bottlenecks came up and further extensions for different purposes have been required. The system has been expanded by the addition of a fast line printer and a high-quality printer that allows the printing of letters and scientific papers.

Several new software packages were adapted and installed. Among these are GPGS, a general purpose package for generating plots on a graphic display and on the Versatec plotter; SPSS, a well-known statistical package; and TEMPUS, a package for dealing with time-series information such as eye-movement data.

In the field of automatic speech handling a real-time hardware synthesizer has been connected to the PDP 11/55. Both the special interface and the driver and control software have been successfully tested so that the synthesizer can be integrated into the speech laboratory. Some additional work has been started: (1) a new interactive software package for analysing, manipulating and resynthesizing intonation contours; (2) an up-date of the speech editor; new special purpose functions will be integrated; (3) development of a concept for a 'word-spotter'.

For the ESF project on second language acquisition (see 3.2) a set of personal computers was bought. They have been prepared in such a way that the ESF team members can use them easily for their coding purposes. A training course in how to use them was supplied.

5.2 Annual Conference

The Production Group organised the workshop 'Dealing with Trouble in Language', which was held September 4-7 in Nijmegen. In addition to members of the Institute, the following participants attended the meeting: J. Bruner, B. Butterworth, D. Caplan, E. Clark, H. Clark, A. Cohen, A. Cutler, G. Dell, R. Dietrich, V. Fromkin, L. Gleitman, W. Huber, A. Karmiloff-Smith, G. Kempen, H. Kolk, W. Marslen-Wilson, S. Nooteboom, E. Schegloff, and R. Wiese.

The following four core issues were discussed: (1) The communication setting. Apparent troubles and repairs may not always be the result of a temporary breakdown in the speech production process. For instance, hesitations and circumlocutionary speech may sometimes be an attempt by the speaker to find a formulation that would be acceptable or understandable to the listener. (2) Becoming aware of trouble. One can discriminate between sources of trouble and ways of becoming aware of trouble. At what moment in the process of formulating an utterance can a speaker become aware that a specific problem has arisen? There is an important issue here of accessibility versus opacity of different levels and units of representation. A further question is whether speakers have a special monitoring device for detecting errors. (3) Ways of dealing with trouble: strategies and mechanisms. How does a speaker go about repairing the detected trouble? If an aphasic speaker or a not-yet-fluent second language user runs into trouble, what options does he have? To what extent can he

avoid certain structures or adapt his messages so as to deal with the difficulties in a reasonable way? (4) Developmental issues. How does trouble lead to change or halting in development? What do we know about the maturation of monitoring and interception strategies in the course of first and second language acquisition?

5.3 The ZWO/Max-Planck Project on Descriptive Language

The year 1982 saw the completion of this project, which began in 1978, involving cooperation between the Interfacultary Unit for Language and Speech and the Institute for Perception Research, Eindhoven. It was capped off by the "Minicongress on Descriptive Language" in December in Nijmegen.

5.4 Teaching

The Institute's staff taught courses of varying duration at the following universities: Free University of Berlin (Stutterheim), Technical University of Berlin (Heeschen), University of California Irvine (Kean), University of Cologne (Ehrich, Friederici, Weissenborn), University of Düsseldorf (Friederici, Heeschen, Kean), University of Frankfurt (Klein), University of Mannheim (Deutsch), University of Nijmegen (Vonk), University of Strasbourg (Wenk).

5.5 Lectures and Colloquia

The Institute organized a number of colloquia. Papers were presented by the following scholars:
C. Adjemian, E. Bach, E. Bates, M. Bierwisch, S. Brice Heath,
B. Butterworth, G. Carlson, B. Comrie, C. Ferguson,
H. G. Geissler, G. Gergeley, U. Glowalla, F. Grosjean,
L. Hall, L. Hellan, P. Hudson, A. Keyser, D. Lebeaux, W. Mohr,
J. Moravcsik, R. Nieuwenhuis, H. Petrie, R. Rommetveit,

M. Silverstein, J. Wertsch, B. Wenk, A. Zimmer.

In addition, in cooperation with the Interfacultary Unit for Language and Speech of the Catholic University of Nijmegen, two seminars were organized in the newly started series 'The Nijmegen Lectures':

In May, Barbara Hall Partee of the University of Massachusetts gave a week-long series on formal semantics. The following four public presentations were included:
- Montague grammar and compositionality
- Lambdas, surface interpretation, and lexical rules
- Nominal and temporal anaphora and discourse representations
- Lexical semantics and "constructional" semantics:
  where conceptual structure comes in
Additional sessions included seminars on "Meaning postulates, lexical rules, and decomposition", and "Anaphora, deixis, and context-dependence", as well as informal discussion groups.

In September, Albert M. Galaburda of Harvard Medical School gave a week-long series on the anatomy of brain structures necessary to the support of the human linguistic capacity, including the following four public lectures:
- Cortical architecture and connectional specificity
- Structural asymmetries in animal and man
- Developmental dyslexia: pathology of asymmetry
- Left-handedness: biological associations
Galaburda also participated in several discussions and meetings with members of the Aphasia group and other members of the Institute. Assistance in preparing for his visit was given by the Institute of Neurology and Neuroanatomy section of the Institute of Embryology and Neuroanatomy of the Catholic University.

5.6 Editorship

In 1983 W. Klein became Editor-in-Chief of the journal Linguistics. He will be helped by Assistent Editor B. Wenk.

5.7 New Building

During 1983 the plans for designing a new building for the Institute were finalized. The constructional work will be started in the spring of 1984 and it is hoped that the new Institute will be ready by autumn 1985.

5.8 Conference and Workshop Papers Presented.

K. Bock, "Coordinating words and syntax in language production", Miniconference on Descriptive Language, Nijmegen, December.

M. Bowerman, "How do children avoid constructing an overly general grammar in the absence of feedback about what is not a sentence?", 14th Annual Child Language Research Forum, Stanford University, March.

- "How do children avoid constructing an overly general grammar in the absence of feedback about what is not a sentence?", Language Acquisition Research Symposium, University of Utrecht, September.

- "First steps in acquiring conditionals: Some cognitive, semantic, formal, and pragmatic considerations", Conference on Conditionals, Stanford University, December.

- "Actions, events, and other nonobjects in the child's establishment of reference", Miniconference on Descriptive Language, Nijmegen, December.

D.S. Bree, "On the semantics of unless", Meaning and the Lexicon, 2nd International Colloquium on the

Interdisciplinary Study of the Semantics of Natural Language, Kleve, August-September.

B. Butterworth, "Jargon aphasia: processes and strategies", Dyphasia Conference, Middlesex Hospital Medical School, London, January.

L. Colombo, "Types of semantic relations in lexical priming", Meaning and the Lexicon, 2nd International Colloquium on the Interdisciplinary Study of the Semantics of Natural Language, Kleve, August-September.

B. Comrie, "Coreferential noun phrase deletion", Symposium on Grammars of Analysis and Synthesis, Institute of Language and Literature of the Estonian Academy of Sciences, Tallinn, U.S.S.R., November.

A. Cutler, "Performance measures of lexical complexity", Meaning and the Lexicon, 2nd International Colloquium on the Interdisciplinary Study of the Semantics of Natural Language, Kleve, August-September.

W. Deutsch, "Possessives in development", Meeting of the Society for Research in Child Development, Detroit, April.

- "Besitz und Eigentum im Spiegel des Spracherwerbs", Symposium Kind und Besitz, University of Essen, April.

- "Kinder als Wortfinder", 6. Tagung Entwicklungspsychologie, University of Regensburg, October.

- "Repräsentation und Abruf von Artikel-Nomen Beziehungen", Arbeitstagung Menschliche Informationsverarbeitung, University of Darmstadt, October.

- "Developmental aspects of reference", Miniconference on Descriptive Language, Nijmegen, December.

- "Language and cognition in early social interaction", British Psychological Society Conference, London, December.

W. Deutsch and N. Budwig, "Form and function in the development of possessives", 14th Annual Child Language Research Forum, Stanford University, March.

V. Ehrich, "The psycholinguistics of secondary spatial deixis", Meaning and the Lexicon, 2nd International Colloquium on the

Interdisciplinary Study of the Semantics of Natural Language, Kleve, August-September.

- "Die Wechselwirkung kognitiver und sprachlicher Komponenten in Raumbeschreibungen", Sommerschule der Deutschen Gesellschaft für Sprachwissenschaft, Konstanz, September.

G. B. Flores d'Arcais, "Automatic and controlled processes: Evidence from psycholinguistics for cognitive neuropsychology", 1st European Conference on Cognitive Neuropsychology, Bressanone, January.

- "Lexical access of function words and meaningfulness", 2nd Congress of the Experimental Psychology Section of the Italian Psychological Society, Bologna, September.

- "The perception of intention in the breaking of an object", Conference on Perception, Trieste, October.

- "Automatic and controlled processing of linguistic information", Academy of Aphasia, Minneapolis, October.

A. D. Friederici, "Agrammatics' aproach to syntax: Dealing with a particular trouble in language comprehension", Conference on Dealing with Trouble in Language, Nijmegen, September.

- "Syntactic processes in sentence comprehension: Some developmental aspects", 18. Linguistisches Kolloquium, Linz, September.

- "Defizite und Strategien im Sprachverständnis: Broca- und Wernickeaphasie im Vergleich, 10. Jahrestagung der Arbeitsgemeinschaft für Aphasieforschung und -Therapie, Zürich, November.

A. D. Friederici and C. Heeschen, "Lexical decision of inflected open class items and inflected closed class words", 21st Annual Meeting of the Academy of Aphasia, Minneapolis, October.

A. D. Friederici and H. H. J. Kolk, "Sensitivity to word order and case marking in agrammatics", 1st European Workshop on Cognitive Neuropsychology: An Interdisciplinary Approach, Bressanone, January.

J. P. Gee and J. A. Kegel, "ASL structure: Towards the foundation of a theory of case", 8th Annual Conference on Language Development, University of Boston, October.

F. Grosjean, "How long is the sentence? Prediction and prosody in the on-line processing of language", Symposium on Prosody: Normal and Abnormal, University of Zurüch, April.

J. Hawkins, "English and German syntax in contact: some general features of contrast and influence", Conference on Foreign Influences on German: Past and Present, University of York, March.

- "Diachronic changes in relation to synchronic universals and typologies in the system of conditionals", Conference on Conditionals, Stanford University, December.

C. Heeschen, "Syntactic disturbances in aphasia", Jahrestreffen des Zentralverbands der Logopäden, Bad Segeberg, May.

- "How agrammatics deal with syntactic trouble", Conference on Dealing with Trouble in Language, Nijmegen, September.

- "Agrammatismus und Paragrammatismus - Kehrseiten ein- und derselben Medaille?", 10. Jahrestagung der Arbeitsgemeinschaft für Aphasieforschung und -therapie, Zürich, November.

M. Hickmann, "Developmental metapragmatics: a proposal", Workshop on Metapragmatics, Center for Psychosocial Studies, Chicago, April.

- "Aspects métapragmatiques du langage et de son développement", Romanistentag, Berlin, October.

S. Hoppe-Graf, "Prinzipien und Strategien bei der Bearbeitung komplexer Rekognitionsaufgaben. Ein Modellentwurf auf der Grundlage verbaler Berichte", 25. Tagung experimentell arbeitender Psychologen, Hamburg, March.

A. Karmiloff-Smith, "Language development as a problem-solving process", 14th Annual Child Language Research Forum, Stanford University, March.

- "Major and minor causes of linguistic and non-linguistic cognitive change", Annual Meeting of the British Psychology

Society, University of Oxford, September.

- "Structure, concept and process in comparing linguistic and cognitive development", Annual Workshop on Human Development: Stage and Structure, University of Tel Aviv, October.

A. Karmiloff-Smith and J. Morton, "Modelling developmental change", Meeting on Modelling Developmental Change, European Association for Psycholinguistics, Paris, September.

M.-L. Kean, "The question of linguistic anomaly in developmental dyslexia", 34th Annual Meeting of the Orton Dyslexia Society, San Diego, November.

W. Klein, "Theorie der Argumentation", Kolloquiumm Argumentation und Rhetorik, Kronenburg bei Aachen, February.

- "Zweitspracherwerbsforschung und linguistische Theorie", 5. Jahrestagung der Deutschen Gesellschaft für Sprachwissenschaft, Passau, March.

- "Intonation and semantics of focus", Symposium on Prosody: Normal and Abnormal,University of Zürich, April.

- "Kritische Regeln", österreichische Linguistentagung, Salzburg, October.

W.J.M. Levelt, "Spontaneous self-repairs in speech: Processes and representations", 10th International Congress of Phonetic Sciences, Utrecht, August.

- "Geesteswetenschappelijke theorie als kompas voor de gangbare mening", Symposium Wetenschap ten goede en ten kwade, Koninklijke Nederlandse Akademie van Wetenschappen, Utrecht, December.

W. Marslen-Wilson, "Perceiving speech and perceiving words", 10th International Congress of Phonetic Sciences, Utrecht, August.

- "Avoiding (and detecting) trouble: How many mechanisms", Conference on Dealing with Trouble in Language, Nijmegen, September.

- "Comments on Elman and McClelland", Symposium on Invariance and Variability of Speech Processes, Massachusetts Institute

of Technology, Cambridge, October.

W. Marslen-Wilson and L.K. Tyler, "Pronoun resolution and utterance resolution", Miniconference on Descriptive Language, Nijmegen, December.

L. Noordman and W. Vonk, "Does the reader make causal inferences in text comprehension?", 25. Tagung experimentell arbeitender Psychologen, Hamburg, March.

C. Perdue, "Second language acquisition by adult immigrants: the European Science Foundation project. Description and preliminary findings", Second Language Research Forum, University of Southern California, Los Angeles, November.

- "Une 'simple' incompréhension: questions méthodologiques à propos d'un travail d'A. Becker et de C. Perdue", Journées d'Etudes CNRS sur la Communication Inter-ethnique, Maison des Sciences de l'Homme, Paris, November.

H. Petrie and B. Butterworth, "The reality of linguistic structures as planning units in speech production", 10th International Congress of Phonetic Sciences, Utrecht, August.

S. Romaine, "The sociolinguistic history of t/d deletion", 3rd International Conference on English Historical Linguistics, Sheffield, March.

- "Style, productivity and morphological change in the history of English: Or, why delicateness hath very properly given way to delicacy and perfectness hath not prevailed", Philological Society, Oxford, June.

- "Variability in patterns of word formation and morphological change in the history of English", 6th International Conference on Historical Linguistics, Poznan, August.

S. Romaine and E.C. Traugott, "Some questions for the definition of style in socio-historical linguistics", 6th International Conference on Historical Linguistics, Poznan, August.

H. Schriefers, "Produktion einfacher Beschreibungen von Bildern: Umkehrung der Effekte von Satz - Bild -

Verifikationsexperimenten?", 25. Tagung experimentell arbeitender Psychologen, Hamburg, March.

J.H. Schumann, "Utterance structure in the basilang", TESOL Conference, Toronto, March.

- "The expression of temporality in basilang speech", Second Language Research Forum, Los Angeles, November.

A. Szabolsci, "Infinitival structures: evidence from object agreement", International Conference on Sentential Complementation, UFSAL, Brussels, June.

L. Tyler, "Real-time processes in Broca's aphasics", CNRS Conference on Cognitive Neuropsychology of Language, Venice, September.

W. Vonk and L. Noordman, "On the relation between inference processes and the reading task", 25. Tagung experimentell arbeitender Psychologen, Hamburg, March.

W. Vonk, L. Noordman and H. Kempff, "On the understanding of because sentences", Meaning and the Lexicon, 2nd International Colloquium on the Interdisciplinary Study of the Semantics of Natural Language, Kleve, August-September.

W. Vonk and P. Wittenburg, "Eye movements during the comprehension of pronouns in text", 2nd European Conference on Eye Movements, Nottingham, September.

J. Weissenborn, "The understanding of misunderstandings: An ontogenetic study", Colloquium on Intercultural Misunderstandings, Deutsche Gesellschaft für Semiotik, Essen, April.

- "Stragegies in children's spatial descriptions: The role of context in discourse development", 7th Biennial Meeting of the International Society for the Study of Behavioural Development, München, July-August.

- "Le role de l'expérience dans l'acquisition du langage", Romanistentag, Berlin, October.

B. Wenk, "Cross-linguistic influence in second language acquisition: The rhythmic dimension", 10th International Congress of Phonetic Sciences, Utrecht, August.

P. Wittenburg, "Eye movement analysis in natural language

research", DECUS Europe Conference, Zürich, September.

P. Wittenburg and P. Eling, "Planning of intonation in Wernicke's aphasia", Symposium on Prosody: Normal and Abnormal, University of Zürich, April.

PUBLICATIONS

Bock, J.K. and J.R. Mazzela: Intonational marking of given and new information: Some consequences for comprehension. Memory and Cognition 11, 64-76 (1983).

Böhme, K.: Children's Understanding and Awareness of German Possessive Pronouns. University of Nijmegen 1983 (doctoral dissertation).

Bowerman, M.: Hidden meanings: The role of covert conceptual structures in children's development of language. In: The Acquisition of Symbolic Skills, Eds. D.R. Rogers, J.A. Sloboda. Plenum Press, New York 1983, 445-470.

Bowerman, M.: How do children avoid constructing an overly general grammar in the absence of feedback about what is not a sentence? Papers and Reports on Child Language Development, Stanford 22, 23-25 (1983).

Bradley, D.C.: Computational Distinctions of Vocabulary Type. Indiana University Linguistics Club release, Bloomington 1983.

Bradley, D.C. and M.F. Garrett: Hemisphere differences in the recognition of closed and open class words. Neuropsychologia 21, 155-159 (1983).

Brée, D.S.: Beslissingstheorie. Encyclopedie van Bedrijfseconomie. Kluwer, Deventer.

Bruner, J. and M. Hickmann: La parole, la conscience et "la zone proximale": Réflexions sur la théorie de Vygotsky. In: Le Développement de L'enfant: Savoir Faire et Savoir Dire, Ed. M. Deleau. Presses Universitaires, Paris 1983, 281-292.

Butterworth, B.: Language Production, Volume 2: Development, Writing and Other Language Processes.

Academic Press, London 1983.

Colombo, L.: Semantic and pragmatic factors in the
representation of "near" and "far". Journal of
Psycholinguistic Research 12, 75-92 (1983).

Clark, E.V.: Convention and contrast in acquiring the
lexicon. In: Concept Development and the Development
of Word Meaning, Eds. Th.B. Seiler, W. Wannemacher.
Springer Verlag, Berlin and New York 1983, 67-89.

Clark, E.V.: Meanings and concepts. In: Handbook of Child
Psychology (4th ed.), Vol. 3: Cognitive Development,
Ed. P.H. Mussen. John Wiley & Sons, New York 1983,
787-840.

Clark, E.V. and B.F. Hecht: Comprehension, production, and
language acquisition. Annual Review of Psychology 34,
325-349 (1983).

Cutler, A. and D.R. Ladd (Eds.): Prosody: Models and
Measurements. Springer Verlag, Heidelberg 1983.

Deutsch, W.: Theorien des Spracherwerbs. In: Berichte über
den 33. Kongreß der Deutschen Gesellschaft für
Psychologie, Ed. G. Lüuer. Hogrefe, Göttingen 1983,
290-297.

Deutsch, W. and N. Budwig: Form and function in the
development of possessives. Papers and Reports on Child
Language Development, Stanford 22, 36-42 (1983).

Edwards, J.: Eyeblink Rate as a Measure of Cognitive
Processing Effort. University of California, Berkeley
1983 (doctoral dissertation).

Ehrich, V.: Da im System der lokalen Demonstrativadverbien
des Deutschen. Zeitschrift für Sprachwissenschaft 2,
197-219 (1983).

Ehrich, V. and C. Koster: Discourse organization and
sentence form. The structure of room descriptions in
Dutch. Discourse Processes 6, 169-195 (1983).

Eling. P.: Consistency of ear advantage: An improvement due
to increase in presentation rate. Neuropsychologia 21,

419-423 (1983).

Eling, P.: Comparing different measures of laterality: Do they relate to a single mechanism? Journal of Clinical Neuropsychology 5, 135-147 (1983).

Eling, P.: Neurolinguistiek: hoe en waarom? Gramma 7, 100-113 (1983).

Eling, P.: Studies on Laterality. Controversial Issues in the Approach to Hemisphere Specialization. University of Nijmegen 1983 (doctoral dissertation).

Flores d'Arcais, G.B. and R.J. Jarvella (Eds.): The Process of Language Understanding. Wiley, Chichester 1983.

Flores d'Arcais, G.B. and R. Schreuder: The process of language understanding: A few issues in contemporary psycholinguistics. In: The Process of Language Understanding, Eds. G.B. Flores d'Arcais, R.J. Jarvella. Wiley, Chichester 1983,1-46.

Friederici, A.D.: Repräsentation und Verarbeitung von lexikalischer und syntaktischer Information: Psycholinguistische Evidenz. Linguistische Berichte 85, 49-63 (1983).

Friederici, A.D.: Aphasics' perception of words in sentential context: Some real-time processing evidence. Neuropsychologia 21, 351-358 (1983).

Gee, J.P.: Anyone's any: A view of language and poetry. Language and Style 16, 123-127 (1983).

Gee, J.P. and F. Grosjean: Performance structures: A psycholinguistic and linguistic appraisal. Cognitive Psychology 15, 411-458 (1983).

Grosjean, F. and J.Y. Dommergues: Les structures de performance en psycholinguistique. Année Psychologique 83, 513-536. (1983).

Grosu, A.: Topicality versus dominance: Reply to Eerteschik-Shir and Lappin. Theoretical Linguistics 10, 97-113 (1983).

Grosu, A.: Markedness, analogy, and noun classes.

Theoretical Linguistics 10, 115-124 (1983).

Hawkins, J.A.: Word Order Universals. Academic Press, New York 1983.

Karmiloff-Smith, A.: A note on the concept of metaprocedural processes in linguistic and non-linguistic cognitive development. Archives de Psychologie 51, 35-40 (1983).

Karmiloff-Smith, A.: A new abstract code or the new possibility of multiple codes? The Behavioral and Brain Sciences 6, 149-150 (1983).

Karmiloff-Smith, A.: Language acquisition as a problem-solving process. Papers and Reports on Child Language Development, Stanford 22, 1-22 (1983).

Klein, W.(Ed.): Intonation. Zeitschrift für Literatur-wissenschaft und Linguistik 49, Vandenhoeck und Ruprecht, Göttingen 1983.

Klein, W.: Spatial orientation in route directions. In: Spatial Orientation Theory, Research, and Application, Eds. H. Pick, L. Acredolo. Plenum Press, New York 1983, 283-311.

Klein, W.: Der Ausdruck der Temporalität im ungesteuerten Spracherwerb. In: Essays on Deixis, Ed. G. Rauh. Narr, Tübingen 1983, 149-168.

Klein, W.: Vom Glück des Mißverstehens und der Trostlosigkeit der idealen Kommunikationsgemeinschaft. Zeitschrift für Literaturwissenschaft und Linguistik,50, 128-140, (1983).

Ladd, D.R. and A. Cutler: Models and measurements in the study of prosody. In: Prosody: Models and Measurements, Eds. A. Cutler, D.R. Ladd. Springer Verlag, Heidelberg 1983, 1-10.

Lee, B. and M. Hickmann: Language, thought and self in Vygotsky's development theory. In: Developmental Approaches to the Self, Eds. B. Lee, G. Noam. Plenum Press, New York 1983, 343-378.

Levelt, W.J.M.: The speaker's organization of discourse.

In: Proceedings of the XIIIth International Congress of Linguists, 1983.

Levelt, W.J.M.: Spontaneous self-repairs in speech: Structures and processes. In: Abstracts of the Tenth International Congress of Phonetic Sciences, Eds. A. Cohen, M.P.R. v.d. Broecke. Foris, Dordrecht 1983, 43-48.

Levelt, W.J.M.: Monitoring and self-repair in speech. Cognition 14, 41-104 (1983).

Levelt, W.J.M.: Science policy : three recent idols, and a goddess. IPO Annual Progress Report 17, 32-35 (1983). Appeared also as: Wetenschapsbeleid: drie actuele idolen en een godin. Grafiet 4, 178-184 (1983).

Levelt, W.J.M. and A. Cutler: Prosodic marking in speech repair. Journal of Semantics 2, 205-217 (1983).

Marslen-Wilson, W.D.: Perceiving speech and perceiving words. In: Abstracts of the Tenth International Congress of Phonetic Sciences, Eds. A. Cohen, M.P.R. v.d. Broecke. Foris, Dordrecht 1983, 39-42.

Marslen-Wilson, W.D. and L.K. Tyler: A reply to Cowart. Cognition 15, 227-235 (1983).

Romaine, S.: Towards a typology of relative clause formation strategies in Germanic. In: Historical Syntax, Ed. J. Fisiak. Mouton, The Hague 1983.

Romaine, S.: Syntactic change as category change by reanalysis and diffusion: some evidence from the history of English. In: Proceedings of the Second International Conference on English Historical Linguistics, Eds. M. Davenport, E. Hansen, H.-F. Nielsen. Odense University Press, Odensee 1983, 9-27.

Romaine, S.: Some social and historical dimensions of syntactic change in Middle Scots relative clauses. In: Proceedings of the First International Conference on English Historical Linguistics, Ed. N. Blake. Avebury

Press 1983.

Romaine, S.: Historical linguistics: Progress or decay? Language in Society 12, 223-237 (1983).

Romaine, S.: On the productivity of word formation rules and the limits of variability in the lexicon. Australian Journal of Linguistics 3, 176-200 (1983).

Romaine, S.: Collection and interpreting self-reported data on the language use of linguistic minorities by means of 'language diaries'. Midlands Association for Linguistic Studies Journal 8, 3-31 (1983).

Schreuder, R., G.B. Flores d'Arcais and G. Glazenborg: Effects of perceptual and conceptual similiarity in semantic priming. Psychological Research 45, 465-483 (1983).

Szabolcsi, A.: Focussing properties, or the trap of first order. Theoretical Linguistics 1, 125-145 (1983).

Tropf, H.: Variation in der Phonologie des ungesteuerten Spracherwerbs, University of Heidelberg 1983 (doctoral dissertation).

Tyler, L.K.: The development of discourse mapping processes: The on-line interpretation of anaphoric expressions. Cognition 13, 309-341 (1983).

Tyler, L.K. and J. Wessels: Quantifying contextual contributions to word recognition processes. Perception and Psychophysics 34, 409-420 (1983).

Wales, R., M. Coleman and P. Pattison: How a thing is called - a study of mothers' and children's naming. Journal of Experimental Child Psychology 36, 1-17 (1983).

Wales, R. and P. Pattison: A study of children's tense and aspect. Melbourne Working Papers in Linguistics 12, 1-13 (1983).

Wenk, B.: Articulatory setting and the acquisition of second language phonology. Revue de Phonétique Appliquéee 65, 61-65 (1983).

Wenk, B. and F. Wioland: Prenez le temps. Le Français dans

le Monde <u>176</u>, 79-83 (1983).