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EDITOR'S NOTE

The AILA Governing Board (Conseil d'Administration) and its International Committee decided from the very beginning when the REVUE DE L'AILA-AILA REVIEW was created, to have one of its issues devoted to PSYCHOLINGUISTICS. In 1984, at the 8th AILA World Congress, I was invited to be its editor, and the hope was expressed that it would appear as soon as the AILA budget would ensure a regular publication of each issue. Further on, I was asked to prepare it for 1987.

The task I received and accepted did not include any specification as to the general topic within "Psycholinguistics" to be dealt with in this issue. It seemed to me, however, that such a thematic issue of the Review had to contain papers connected with some practical problems and as such pertaining to the area of "Applied Psycholinguistics" (APL); it was also clear for me, as the editor of the issue, that it should not contain an article written by me.

The authors invited to submit articles for this issue work in various countries of the world, have an outstanding reputation in APL research, and are also well-known in AILA circles, as well as in other international associations, and/or are associated with university centers involved in the applied areas.

Professor Renzo Titone, professor of language and communication, head of the department of "Psychology of childhood and socialization" at the University "La Sapienza" in Rome, is currently president of the "International Society of Applied Psycholinguistics" (ISAPL) and also one of the two vice-convenors of the "AILA Commission of Psycholinguistics", author of a great number of works covering the field of APL. He has chosen to write an article on one of his preferred topics: bilingualism; he deals with an important aspect of bilingualism, the psycholinguistic approach of early reading in the two languages.

Professor Katharine Butler, of the University of Syracuse, director of the "Center of Research" at the "School of Education", currently treasurer of ISAPL, also officer of other important associations connected with practical aspects of speech improvement (president of the "International Association of Logopedics and Phoniatry", president of the New York State "Speech-Language-Hearing Association"), is a well-known name in the area of speech disturbances. Her article deals with problems she discussed in one of the main lectures at the ISAPL first Congress (Barcelona): *Speech and language disturbances*, presenting here a survey of recent studies in this area, mostly published in the United States.

Professor Hans Dechert, co-chairman of the department of Anglistics and Romanistics at the University of Kassel, is secretary-general of ISAPL, second co-convenor of the "AILA Commission of Psycholinguistics" and co-editor of the "AILA Commission of Psycholinguistics Newsletter". His contribution has its genesis in the paper he presented at the Round Table organized by G. Kasper and C. Færch at the ISAPL first Congress (Barcelona), which testified to the interest many younger researchers in applied linguistics have in "introspective procedures in research on foreign language learning". It was thought that the readers of this Review would like to be informed about the interests of the new generation in APL.

In this issue there is also a paper on "procedural knowledge" as a part of communicative competence in foreign language learners, written by professors Gabriele Kasper - from the Institute of Linguistics of the University

of Århus, Denmark - and Claus Færch - formerly at the Institute of Psychology of the University of Copenhagen, whose untimely death, in February 1987 (just after I received the article), profoundly saddened us.

When I received an abstract for the "Symposium of Psycholinguistics", which I had to organize for the AILA Sydney Congress 1987, from Dr. Deborah Keller Cohen (Director of the English Composition Board at the University of Michigan, Ann Arbor, and associate professor of linguistics), I thought it was useful to draw attention to a topic less studied in APL, and I invited the author to contribute an article for this issue on some practical aspects of the reading of "periodic bills" whose writing could be improved on the basis of applied psycholinguistic investigations.

The order in which the articles are presented in this Review (and in its Table of Contents) by no means indicates any "hierarchy"; neither was an order of "general vs particular" intended. The only intent of an order - a symbolic one - is the precedence offered to the article which was co-signed by the young researcher who passed away this year.

I think the topics and the articles dealing with them deserve the interest of those who work in the field of applied linguistics, and while thanking the authors for their contributions, I hope they will be read with interest by the readers of the REVUE DE L'AILA/AILA REVIEW.

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PROCEDURAL KNOWLEDGE AS A COMPONENT OF FOREIGN LANGUAGE LEARNERS' COMMUNICATIVE COMPETENCE*

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In this paper we would like to highlight one component of foreign language (FL) learners' communicative competence which has so far received little attention in descriptions of communicative competence: what we shall refer to as *procedural knowledge* (but cf. Widdowson 1979a,b, Breen/Candlin 1980, Canale/Swain 1980, Færch/Kasper 1980, 1983a, Knapp 1980, Sharwood Smith 1986). Both our description of the subcomponents of this type of communicative knowledge as well as its relationship to other components of communicative competence are highly tentative and open to discussion. We shall first sketch the outline of a model of communicative competence and characterize the component of procedural knowledge as an integral part of this. Following this, we consider some of the characteristic features of communication in a traditionally taught foreign language class of Danish learners of English with a special view to the function of procedural knowledge.

1. Communicative competence

The most significant difference between native language (NL) acquisition and foreign language learning is undoubtedly the fact that FL learners have a more or less well-developed basic communicative competence in their NL. The importance of acknowledging this and of utilizing it in the foreign language classroom has been argued e.g. by Breen/Candlin 1980 and House (in press). This basic communicative competence assumedly consists of communicative knowledge which the learner considers to be language neutral with respect to a specific FL, and communicative knowledge which he considers language specific.

Descriptions of 'language neutral' and 'language specific' aspects of communicative knowledge have typically concentrated on 'underlying' knowledge, e.g. lexical and idiomatic knowledge (see Kellerman 1978 for an exemplification of this). But in addition to this, communicative knowledge also comprises knowledge *how to use* linguistic rules and elements. Within the framework of cognitive science, these two types of knowledge are referred to as *declarative* ("knowing that") and *procedural knowledge* ("knowing how") (see e.g. Anderson 1976). In the following we adopt this

* A different version, in German (which was modified for the present article) appeared in Bolte/Herrlitz 1985, 169-200. The research reported on has been partly supported by a grant from the Danish Research Council for the Humanities to the project 'Procedural Knowledge'.

terminology, using 'procedural knowledge' in its literal sense and 'declarative knowledge' as a metaphorical label referring to the counterpart of procedural knowledge.

From the perspective of FL learning and communication, it would be relevant to investigate what parts of procedural knowledge are considered language neutral and what parts specific to the NL when assessed relative to a specific FL. This problem, unfortunately, can hardly be approached yet as there is a need for characterising procedural parts of communicative knowledge and for clarifying how these relate to (underlying) declarative knowledge. In section 2 of this paper we therefore give priority to a description of components of procedural knowledge, whereas the question of language neutrality/specificity will only be sporadically touched upon.

As a background to our description of procedural knowledge in 2, we now list some areas of declarative communicative knowledge. No attempt is made at providing an exhaustive list:

(a) *Paralinguistic* and *extralinguistic* means of communication (i.e. the function of gestures, mime, prosody, etc.).

(b) *Linguistic* means of communication (including knowledge about rules/items belonging to the levels of phonology/graphology, morphology, syntax, lexis).

(c) *Pragmatic* and *discourse* knowledge (e.g. knowledge how to express speech acts by linguistic and paralinguistic means, knowledge about the structure of different discourse types, knowledge about cooccurrence restrictions on speech acts (possible adjacency pairs)).

(d) *Socio-interactional* knowledge (knowledge of general social rules for interaction in a given society/type of situation (e.g. "institutional knowledge" like knowledge about appropriate interactional behaviour in a school setting); knowledge of what contextual features of the communicative situation and what social roles between interlocutors to take into consideration when selecting speech acts; etc.).

2. Procedural knowledge

Procedural knowledge can be divided into the following subcomponents:

- (1) reception procedures
- (2) production procedures
- (3) conversational procedures
- (4) communication strategies
- (5) learning procedures.

Basic to the first 4 types of procedures is the language user's ability to continually (re-)assess the communicative situation in which he is involved in terms of its pragmatically relevant context features (cf. van Dijk's (1977b) distinction between situation and context). On the basis of this *contextual (re-)assessment*, participants interpret their interlocutors' speech activity and organize their own. In all kinds of communicative activity, both the objective features of the *task* to be performed, and its subjective perception by the language user constitute major factors in contextual (re-)assessment (see e.g. Goldman-Eisler 1961 for task-specific speech production processes, and Tannen 1979 for different discursal procedures adopted by Greek and American subjects narrating the same film). In interactional (= + immediate

interlocutor feedback) situations, the interlocutor's conversational behaviour is obviously a particularly relevant 'context factor'; this has been captured in the notion of *negotiation* of meanings and functions in discourse (see Edmondson 1979, 1981b, Widdowson 1979a, Breen/Candlin 1980, Tarone 1981), which might be viewed as the behavioural correlate of contextual (re)assessment.

A comprehensive account of procedural knowledge would have to include procedures operating in using and learning both spoken and written language. However, as the second part of this article analyses an example of classroom discourse in which reading and writing procedures are not relevant, we shall concentrate on procedures for oral language use.

2.1 Reception procedures

Reception can be subclassified into perception, referring to the processing of speech sounds, and comprehension, referring to the assignment of meaning to incoming linguistic information. We shall restrict our remarks to the latter type of reception.

A heuristically useful way of modelling comprehension in speech reception seems to be the *schema* or *frame theory* approach as developed within cognitive science (see e.g. the overview in Tannen 1979). Schemata or frames are metaphors for the organization of knowledge units in a hierarchical system. Such units contain, according to van Dijk (1977b), "the essential, the typical and the possible" information about concepts, and are to some degree conventionalized in a given society. Within a frame hierarchy, the highest frames contain the most general and abstract, the lowest frames the most specific and concrete knowledge. In processing incoming data, a recipient may either start from the data itself and match it against lower-level frames, which then activate increasingly more comprehensive higher-level frames. This data-driven process is referred to as *bottom-up processing*. Alternatively the recipient starts by activating a higher-order frame which then searches for the appropriate data to match it. This frame-driven process is called *top-down processing*.

If incoming data cannot be directly matched by a relevant frame - for instance, in cases where the recipient does not know a lexical item in an incoming utterance - more general frames and context information are used in order to assign meaning to this data. Such a procedure has been referred to as *inferencing* (see e.g. Warren/Nicholas/Trabasso 1979). As for FL comprehension, Carton (1971) specifies three types of information which may be used for probabilistic guesses about unfamiliar FL material: intralingual (=IL), interlingual (=NL) and extralingual (=contextual) information (see also Bialystok/ Fröhlich 1977, Bialystok 1978, 1983, Færch 1981, Hastrup 1985, Kasper 1984).

Furthermore, some types of incoming linguistic data have been found to be processable by the recipient's directly assigning one particular meaning to it, whereas in the processing of other types of data the recipient has to establish one or more preliminary meanings first which he then matches against co- and contextual cues in order to determine the relevant meaning. The first type of procedure has been referred to as *one-meaning processing*, which is applied in the comprehension of, for instance, direct and conventionalized indirect speech acts, routine formulae, and idiomatic expressions; the second has been termed *multiple-meaning processing* and is used in

understanding, for example, non-conventionalized indirect speech acts, living metaphors and polysemous words (see for the comprehension of indirect speech acts in NL e.g. Clark/Lucy 1975, Clark/Schunk 1980; of indirect speech acts in FL Kasper 1984; of lexical items in FL Færch 1981 and Haastrup 1985).

For comprehension at the lower linguistic levels, Clark/Clark (1977) provide an overview of receptive procedures which focus on syntactic and semantic properties of incoming data, e.g. the use of affixes in order to decide on a word class, or focussing on content words alone in order to build propositions. To the extent that comprehension procedures rely on structural properties of a particular language, the procedures themselves become language-specific and can therefore not be transferred from general procedural knowledge (as is for instance the case in predicting subsequent items from items which have already occurred).

2.2 Production procedures

Production procedures are responsible for the planning and execution of speech at all linguistic levels from articulation to discourse. Discussions of general principles of speech production can be found in Fry 1973, Laver 1973, Clark/Clark 1977 and Dalton/Hardcastle 1977.

More specific planning and execution procedures have been established, based on studies of temporal variables (see e.g. Goldman-Eisler 1968, Dechert/Raupach 1980a,b) and of speech slips (see e.g. Fromkin 1973). Of particular interest from the perspective of FL speech production is the hypothesis forwarded by Baars 1980 that speech slips indicate "competing plans", i.e. simultaneously occurring planning procedures, each of which might have led to a correct result but which when operating together lead to slips.

More specifically for FL learners, Seliger (1980) has proposed a distinction between 'planners' and 'correctors'. 'Planners' adopt the procedure of delaying the execution of a stretch of speech until planning has been completed. This results in performance marked by many pauses at constituent boundaries and few self-corrections. 'Correctors', on the other hand, initiate execution without having foreseen problems and therefore have to self-correct. Related to Seliger's suggestion is the proposal forwarded by Dechert 1983 (based on Lesser/Erman 1977, 749f) that learners may use 'islands of reliability' (i.e. readily accessible linguistic expressions) to gain time for the planning of problematic parts of the discourse (see also the contributions in Dechert/Möhle/Raupach 1984).

A procedure of a rather different kind in speech production is that of monitoring the production procedures themselves ('pre-execution monitoring') and of matching the speech product against originally formulated goals ('post-execution monitoring'). Speech slips indicate failure in pre-execution monitoring in that competing plans have not been detected. Cutting across the distinction between pre- and post-execution monitoring, a distinction is usually made between monitoring based on more implicit types of declarative knowledge (monitoring based on explicit (or 'representational') knowledge (cf. Widdowson's 'reference rules' (1978b) and Krashen's 'monitor', containing 'learned' knowledge (1981)).

2.3 Conversational procedures

Procedural knowledge at the conversational level involves (at least) the following components:

(i) How to express speech acts in socially appropriate ways, observing general principles of face-saving (Goffman 1967, Brown/Levinson 1978, Leech 1977, Edmondson 1981a). This includes knowledge how to realize speech acts in terms of directness/indirectness, how to use upgrading/ downgrading devices, and how to supplement speech acts by supporting moves like e.g. 'grounders' or 'steers' (House/Kasper 1981, Edmondson/ House 1981, Edmondson 1981b).

(ii) How to connect sentences into "text" by means of cohesive devices (lexical or grammatical, Halliday/Hasan 1976, in IL discourse: Stemmer 1981) and by observing principles of coherence (van Dijk 1977a, Widdowson 1978a).

(iii) How to perform discourse regulatory functions. This can be done both para- and nonlinguistically (by intonation, gesture and gaze), or by explicit statements such as "I'd like to say something". Moreover, discourse regulation can be performed by a special class of lexicalised and non-lexicalised elements, known *as gambits* (see e.g. Edmondson/House 1981, Færch/ Kasper 1984). For instance, **uptaking** (or giving back-channel information, Duncan 1974) can be realised by a receipt (*hm, I see*); *turn-taking* by a starter (*well*); *turn-keeping* by hesitators (*erm*, repetitions) and cajolers (*you know, you see*); *turn-giving* by appealers (question tags); and discourse boundaries can be indicated by means of markers (*okay, good*).

(iv) How to remove communication blocks by means of 'repairs', i.e. corrections, reformulations or clarifications provided either by the speaker who is responsible for a problem (the 'self') or by the interlocutor (the 'other'). In studies on repair work, the problem is usually referred to as "the repairable" or "the trouble source", and a distinction is observed between the initiation and the completion of repair (see e.g. Schegloff/Jefferson/Sacks 1977). This results in four structurally different types of repairs:

(a) self-initiated, self-completed repair ("I talked to Peter I mean the boy I told you about yesterday")

(b) self-initiated, other-completed repair ("I talked to Peter er what's his name?" - You mean Peter Johnson")

(c) other-initiated, self-completed repair ("I talked to Peter" - "To whom?" -"To the boy I told you about yesterday")

(d) other-initiated, other-completed repair ("I Just talked to Peter" - "You mean the boy you told me about yesterday?").

Of these, (b) is similar to an 'appeal', (c) involves the 'other' in performing a 'repair request'.

In studies of native speaker - native speaker interaction (e.g. Schegloff/Jefferson/Sacks 1977), a clear preference for self-repair has been found (reflected in the order in which we have arranged the four repair types). In studies of FL communication, the situation is complicated by the fact that in such situations there is often an unequal distribution of (linguistic) knowledge (e.g. communication between a learner and a native speaker or between teacher and pupils). This implies that the four repair types have to be further differentiated according to whether the producer of the trouble source is a/the learner or the native speaker/teacher. Furthermore, interactional principles like that of face-saving may be overruled by other

principles in asymmetric communicative situations between learners and native speakers and in classroom communication, resulting in different preferences. Some results of analyses of dyadic learner-native speaker interactions are reported in Gaskill 1980, Færch/Kasper 1982; results from analyses of repairs in FL classrooms are reported in e.g. Rehbein 1984, Kasper 1985.

In using these conversational procedures, the language user activates both general and language-specific pragmatic knowledge. For instance, he knows that performing an inherently face-threatening speech act calls for the use of indirectness and for downgrading modality markers. Adequate downgrading in German presupposes knowledge of e.g. modal particles and their pragmatic functions. Or when approaching a stranger, the language user activates the interactional norm holding for such situations, which is to signal 'territory invasion'. The linguistic realization of this opening move in British English requires a routine formula ("excuse me"), whose pragmatic specification (which distinguishes it from routine formulae like e.g. "pardon" or "sorry") is part of a competent participant's language-specific knowledge.

2.4 Communication strategies

When communicating in NL or FL, individuals inevitably have to solve problems in the planning/execution as well as in the comprehension of speech, although the frequency of such problems may be considerably higher in FL than in NL communication. A part of individuals' procedural knowledge is specifically geared towards developing solutions to such problems. Following Canale/ Swain, we shall refer to this part of procedural knowledge as the individual's "strategic competence" (1980), defining communication strategies as "potentially conscious plans for solving what to an individual presents itself as a problem in reaching a communicative goal" (Færch/Kasper 1980, 1983c).

Of particular relevance for FL learning and communication are the questions whether FL users have specific strategy preferences and whether different types of strategies have different learning effects. The question of strategy preferences and the related question of the communicative efficiency of different types of strategies have been investigated in a number of studies (Bialystok/ Fröhlich 1980, Haastrup/Phillipson 1983). Of possible relevance for 'communicative efficiency' is the distinction between 'overt' and 'covert' strategies, discussed in Færch/Kasper 1983b. 'Overt' strategies are described as strategies which manifest themselves in performance in the way that the language user's reception or production problem surfaces (e.g. as a series of pauses, filled and unfilled or as a direct appeal). Overt strategies lead to loops in the discourse which, from the point of view of a smoothly flowing discourse, might be considered inefficient. Overt strategies reflect Seliger's corrector-type of production, whereas 'covert' strategies are related to a preference for planning-behaviour: a 'covert' strategy is a preplanned strategy which leaves no trace of uncertainty in the immediate context of the strategy. Covert strategies are therefore more efficient in the sense that they do not interfere with the gradual development of the ongoing discourse. Furthermore, covert strategies are inherently face-saving and might therefore be preferred by linguistically ambitious FL users who find it socially difficult to 'admit ignorance'. Yet, apparently efficient covert strategies are only truly successful in cases where they convey or

reconstruct the intended meaning sufficiently precisely. If this is not the case, covert strategies may lead to serious misunderstanding as the interlocutor, who is not warned by strategy markers, will take the 'strategic' element at face-value. Moreover, the learning effect of covertly used strategies is probably lower, as they do not allow for (direct) feedback.

2.5 Learning procedures

In language learning, two basic processes can be distinguished: the establishment of IL knowledge (i.e. of the rules and items constituting the IL system at its different developmental stages), and its automatisisation. From a cognitive point of view, the establishment of IL knowledge can be considered as involving the processes of *hypothesis formation* and *hypothesis testing* (see Færch/Kasper 1980, Knapp-Potthoff/Knapp 1982, Færch/Haastrup/Phillipson 1984 for detailed accounts). Hypotheses about FL rules and items can be formed by the learner's making use of prior linguistic knowledge (NL knowledge, knowledge about other FLs or about the FL in question), by inducing them from FL data, or a combination of both. The procedures relating to these knowledge and data sources are referred to as interlingual transfer, (intra)lingual generalisation, and inferencing. - In order to find out whether the established hypotheses are correct, the learner can test them in various ways (see Knapp-Potthoff/Knapp 1982:138ff): (a) receptively, by comparing his hypotheses to FL input; (b) productively, by producing utterances containing the relevant hypothesis and assessing its correctness in terms of received feedback; (c) metalingually, by consulting a native speaker, teacher, grammar book or dictionary; (d) by eliciting uptake and repair in ongoing discourse ("diskursive Vergewisserungsstrategien").

One of the characteristics of FL learning through institutionalised teaching is that the processes of hypothesis formation and testing are guided in various ways: by selecting and grading the FL input, by highlighting FL aspects which can serve as cues for establishing hypotheses, etc. To which extent these processes can efficiently be shortened (or even dispensed with) by giving the learners explicit metalingual rule formulations before they have developed their own hypotheses is a matter of debate. It touches upon issues of inductive versus deductive learning/teaching, the psycholinguistic function of pedagogical rules, and, more generally, the cognitive status of different types of linguistic knowledge and its role in FL use. For different positions as to the function of different types of linguistic rules and knowledge see e.g. Bialystok 1978, Krashen 1981, Seliger 1979, Færch/Haastrup/Phillipson 1984, and the discussion in Knapp-Potthoff/Knapp 1982:179ff.

In addition to language learning through the formation and testing of hypotheses, some FL material lends itself to learning through imitation, i.e. copying of a model (teacher, native speaker). Imitation learning requires that the FL material can be stored en bloc in short-term memory before its transmission to long-term memory, and that it is not analysed into underlying rules and components. These conditions put severe limitations on the linguistic material which can be learned by imitation, such as prosody and prefabricated patterns.

In order for FL knowledge to become available for (spontaneous) use, it has to be automatisised. Automatisisation can be brought about by practising the FL productively and receptively in a variety of situations, and in various

tasks. Broadly speaking, one can distinguish formal and functional practice, depending on whether a formal aspect or communicative purposes are in focus (Bialystok 1978).

It has recently been suggested that in order to enable FL learners to consciously further develop their FL proficiency in non-educational settings, making them aware of their learning procedures should be part of FL teaching ("Weiterlernen", Knapp 1980, Knapp-Pothoff/Knapp 1982:168ff). This provides an additional perspective for research into the aspects of procedural knowledge which are activated in language learning.

2.6 Accessibility

In addition to the types of procedural knowledge just discussed we would like to mention *accessibility* as an additional component of communicative competence. By this we refer to the degree of availability of various communicative resources. Even within the native language, some aspects of the linguistic system (e.g. routine formulae and gambits) are more highly automatized than others (e.g. words belonging to specialized semantic areas which we do not use every day), and in the interlanguage this difference is even more marked. The accessibility of linguistic knowledge may be more relevant for productive than for receptive purposes as well as more relevant for interactional speech than for writing. In interactional situations one could hypothesize that the higher the accessibility of relevant linguistic items, the less the speaker's need for focussing his attention on his own speech production, which may increase his 'situational empathy', i.e. his ability to focus on how his interlocutor responds to his speech.

3. Communicative competence in the classroom

As demonstrated by the growing body of research into foreign and second language classrooms (e.g. Bolte/Herrlitz 1985, Lörcher 1983, Seliger/Long 1983, Wagner/Petersen 1983, Ellis 1985, Færch/Kasper 1985, Mitchell 1985, Sharwood Smith 1985, Kasper 1986), the communication patterns inside the educational setting vary radically from those outside school. While this holds for any type of instruction, the crucial difference between subject matter and language teaching is that in the former, the knowledge to be conveyed to students is of primary importance while the ways in which this is achieved is subordinate (though by no means irrelevant) to this goal. In language teaching, however, the knowledge transmitted to the learner is both the vehicle and object of instruction: to a large extent, the medium is the message.

Classroom interaction thus leads to a type of communicative competence that, at least in part, reflects the communicative norms holding in formal settings (cf. Kasper 1981, 1982 who provides evidence for learners' classroom specific pragmatic and discursal knowledge). An essential question is therefore to what extent learners can achieve communicative goals outside school by means of their classroom-based and in many respects restricted IL competence. What is the overlap between the communicative competence needed in and outside the classroom? How deep are the gaps, and how capable is the learner of bridging them?

Basically, there are two solutions how best to cope with the perceived

difference between communicative competence within the educational setting and the various types of communicative competence needed in communicative situations outside school:

(1) Taking the future communicative needs of learners into consideration and selecting the teaching content accordingly. This is the solution represented by the Threshold level approach (e.g. van Ek 1975, Conseil de l'Europe 1976, Europarat 1980, cf. also Wilkins 1976, Piepho 1974). This 'static' solution has been criticized for a number of reasons, cf. Widdowson 1979, Knapp 1980.

(2) Accepting that some gaps are inevitable as the classroom cannot prepare for all conceivable types of communicative situations and focussing on means of bridging these gaps (cf. Færch/Kasper 1980, 1973a, Breen/ Candlin 1980, Knapp 1980). In our description of procedural knowledge above we indicated some 'dynamic' aspects of communicative competence which might help learners achieve their communicative goals.

The approach we consider most promising for general-purpose, foreign language teaching in schools is the latter: increasing the pupils' ability to bridge gaps between known and unknown communicative situations by increasing their procedural knowledge. This can be achieved by changing the interactional structure of the classroom (e.g. so that the teacher does not perform all the initiating moves, see below); by increasing the pupils' meta-communicative awareness of procedural components of communicative competence (e.g. by making them aware of the function of communication strategies (Færch/Kasper 1986), of gambits and modality markers (Wildner-Bassett 1984); and by practising types of communication which resemble non-educational discourse (for some suggestions of this, cf. Candlin 1981, Edmondson 1982).

4. Analysis of a teacher-centred English lesson with respect to procedural knowledge

In the following we analyse parts of a 'traditionally' taught Danish English lesson, in which the teacher conducts a 'discussion' of a literary text (*The Graduate*) which the learners have prepared at home. The teacher, who is in her thirties and who has several years of teaching experience, seems to be on good terms with the 25 learners in the class (grade 10, science line, sixth and last year of English). The atmosphere is generally relaxed, and in spite of its 'teacher-centredness' there is nothing authoritarian about the way the teacher conducts the lesson. We have chosen it not because it exhibits 'bad' teaching (which it does not) but because it serves as a good illustration of how restricted this type of classroom communication is with respect to enabling the learners to develop their procedural knowledge in the FL. Our analysis of the lesson will therefore be selective in that we highlight some of the aspects of procedural knowledge discussed in section 2.

4.1 Contextual (re)assessment

In dyadic interaction, a speaker can assess the effect of his speech either by means of the verbal as well as non-verbal uptaking signals produced by the recipient and interspersed with the speaker's turn, or by assessing the degree of coherence between the speaker's own move(s) and the

recipient's subsequent moves. In teacher-centred classroom communication, teachers typically nominate next speaker only after they have completed their own moves, which means that they can rely on no one pupil to provide *verbal* uptaking information while they speak: the primary source of feedback information for the teacher is how the nominated pupil responds. This makes it difficult for teachers to assess whether they have made use of linguistic means which are understood by their pupils as intended. Consequently, teachers often express their communicative intention in alternative ways, as illustrated by example (1).

- (1) *Teacher*: is there any new er- no look at the way the two fathers behave to their hildren - Mr Robinson to Elaine and Mr Bradley to er Benjamin [clears her throat] is there any er er do the different ways of behaving have anything in common do you understand my question - do you see some parallels between the way the two fathers treat their children here - Jette

Occasionally, the teacher changes her focus in self-repairing, apparently in an attempt to ask a question which is easier from a content point of view. This, however, may make it more difficult for the pupils to respond appropriately as they may have started planning what to say according to the teacher's first formulation but are then forced to revise their plans in the light of the teacher's now different question; compare example (2):

- (2) *Teacher*: what would that mean to most of the people present in the church the fact that he actually takes a cross using it - that's only a dead thing does it matter so much

4.2 Speech planning

The teacher is in complete control of turn-assignment, she claims or re-assigns the turn as soon as a pupil has provided a minimally adequate reply, without waiting for possible follow-up moves. One consequence of this is that the pupils hardly ever get a chance to plan their contribution carefully and over long stretches of speech. Furthermore, the pupils have little possibility for dealing with problems in their speech planning, as is illustrated by the following example in which the pupil's problem-indicating hesitation leads to a loss of turn:

- (3) *Learner*: he doesn't think what other thinks about him when he shouts
and er
Teacher: in the church yes...

4.3 Gambits

The pupils rarely use gambits as discourse-regulating devices, which is probably caused by the fact that these would be redundant in this type of classroom discourse. As the teacher assigns the next turn at speech, often to a pupil who has bid for it, there is no need for the pupil to indicate by a starter (e.g. *well*) that he is going to say something. Furthermore, because of the teacher's acceptance of minimal replies, combined with the pupil's

acceptance of the teacher's control function, the pupils rarely try to self-repair or keep their turn by using turn-keeping devices. Interestingly enough, the few cases that do occur in the data of pupils' self-repairs often contain a *Danish* self-repair initiator (the conjunction *eller* ('or')), sometimes used with a turnkeeping function:

"it's about Benjamin and Elaine (2) his father - - eller - her father..."

Finally, whereas there is little room for verbal uptaking on the part of the pupils, as has already been pointed out, the teacher herself uptakes a lot by means of various types of gambits which have both a discourse regulating and an instructional function:

- (4) *Learner*: she told him that Elaine was leaving and er
Teacher: yes that she had left yes
Learner: and there was a letter to him
Teacher: mm - yes - [...] Erik
Learner: er he talks to er Elaine's roommate
Teacher: yes
Learner: and then he finds out that the roommate had to send the clothes to Elaine's home
Teacher: mm
Learner: and then he figures out what Elaine had to do in the house of Robinsons
Teacher: aha...

4.4 Repair and communication strategies

The most frequent repair type in this data is the teacher's self-initiated and self-completed repair of a trouble source produced by herself. If one disregards self-repairs due to problems in speech planning and considers self-repairs only which seem to be pedagogically motivated, two types of trouble-sources remain: original elicitations which the teacher re-assesses as inadequate (see 4.1 above), and lexical trouble sources. Lexical trouble sources are repaired by substituting the original word in various ways, e.g. by the substitution of a more specific by a more general word:

- (5) *Teacher*: now Kim found out that something has happened a partnership has been dissolved has been stopped

or by the substitution of a FL word by its NL equivalent without (6) or with subsequent FL paraphrase (7):

- (6) *Teacher*: and you remember we talked erm about the values of pa the values of the parent generation - foraeldregenerationen
(7) *Teacher*: certainly she's very considerate hensynsfuld to other people always thinking of problems of other people

From the teacher's point of view, these self-repairs serve to ensure understanding of lexical items which the pupils might not know, and function as a way of vocabulary teaching. But although they are no doubt efficient

procedures for achieving immediate comprehension, a consequence of their frequent application is that the learners do not get much of a chance to employ ("psycholinguistic") receptive strategies such as inferencing, or to use interactional strategies such as receptive appeals, i.e. to initiate other-repair, From the point of view of the learners' communicative needs in non-educational settings, the teacher's preference for self-repair is therefore disadvantageous. For a more detailed analysis of repair in this lesson, see Kasper1985.

The learners' opportunity for using productive communication strategies is equally rare, for reasons given above (4.2). When it occurs, the learners' preferred strategies are direct appeals, realised in either IL or ML (8), or paraphrases, which function as indirect appeals (9).

(8) *Learner:* eer I think she is very - - hvordan siger man populaer - ['pju:pule]

Teacher: popular

Learner: popular - because er...

["hvordan siger man populaer" = 'how do you say popular']

(9) *Learner:* and then he asked her - the girl who - - is very near to her

Teacher: yes do you know what it's called the one with whom you share your room you call that a - roommate - -

Although many instances of transfer from Danish can be found in the learners' utterances, there is little indication for them being the result of a transfer *strategy*: rather, they seem to be due to automatic NL transfer. In the rare cases where the learners employ the NL for preplanned problem-solving, they show awareness of this possibly leading to deviant utterances, as in manifested in the metalingual statement in (10):

(10) *Learner:* I think he behave himself like that if you can say so

[Danish: "han opfører sig sådan"]

4.5 Choice and realization of speech acts

We have already commented on the very restricted and hence predictable inventory of speech acts found in the data. The teacher typically comments on an aspect of the novel under 'discussion'; these comments provide the context for a question to the pupils. The questions relate to factual information, interpretation, giving reasons or value judgements on the basis of the text. In the given institutional context, the teacher's first pair parts exert a specifically strong conditional relevance on the second pair parts: the pupils are expected to provide the elicited factual information, interpretation, reason or value judgement, but they are not encouraged to expand their replies so as to include unelicited comments, reasons or alternative interpretations - i.e. they are not encouraged to employ argumentative procedures.

With respect to *speech act realization*, the pupils use basically 2 types: they either express the propositional content without any modification (which holds true for most of the pupil replies found in the data), or they tone down the assertive force of their contribution by subjectivizing it ("I would say", "I think") or by 'hedging' ("then they have to be mad or something").

6. Conclusion

Throughout this article, we have worked from two basic assumptions: the distinction between declarative and procedural knowledge, and the context-sensitivity of procedures activated in FL learning and use. These assumptions need a few more specifying remarks, which at the same time indicate some directions for future research.

(1) For the sake of clarity, we have drawn a hard and fast distinction between 'declarative' and 'procedural' aspects of communicative knowledge. However, there is good reason to assume that this distinction is not as clear-cut as our description leads one to believe, at least not in those areas of communicative knowledge in which a sequential aspect is essentially involved, e.g. in syntax, pragmatics and discourse. The controversy in cognitive psychology between the 'declarativists' and the 'proceduralists' (cf. Anderson 1976 for a discussion of this) suggests that the distinction is perhaps not objectively required but established as adequate relative to a given goal. Further studies into declarative/ procedural aspects of communicative competence will therefore have to formulate non-arbitrary psychological, communicative and/or pedagogical criteria for drawing the distinction.

(2) We have assumed that there is an intimate relationship between pragmatic and discursal characteristics of communicative situations and the types of procedural knowledge that learners develop in these situations. We furthermore assume that learners who have learned a FL primarily under classroom conditions will transfer classroom-specific preferences of procedural knowledge to communication in non-educational settings. Further research will have to contrast learners' activation of procedural knowledge in different varieties of FL learning and communication situations in and outside the classroom in order to determine to what extent these assumptions can be substantiated.

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EARLY BILINGUAL READING: PSYCHOLINGUISTIC THEORY AND RESEARCH

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Introduction

The problem of the feasibility and advisability of teaching reading in two languages simultaneously at preschool age has recently become an important and fascinating issue for psychologists and educators. Studying the aspects and factors underlying the process of early bilingual education, has attracted the interest of students of child bilingualism and bilingual education, developmental psychologists and psycholinguists, educators of bilingual children and of migrant workers' children. A growing conviction regards the possible positive effects of early reading and early bilingual literacy upon intellectual growth and general education.

It is more and more commonly believed that the benefits found to be present in a score of cases recorded by a few attentive authors can be generalized to larger populations of bilingual children at pre-school and elementary school age. However, anecdotal experience needs boosting by well-grounded experimental research.

It is the purpose of this writing to outline both bygone experiences and ongoing research in order to define prospects and perspectives.

1. Theoretical perspective: Early Bilingual Reading (EBR) and the child's psychological development

Bilingual reading is related on one side to intellectual growth and on the other side to basic education. It is therefore necessary to define some basic concepts connected with the three areas of primary concern, namely the mutual relationship between language and intelligence from a developmental point of view, the interdependence between bilingualism and reading, and the relationship between bilingual reading and basic education.

1.1 Early bilingualism and Intelligence

Bilingualism is not a monolithic state of mind and behaviour, but a kind of linguistic competence having varying degrees. Usually one language is dominant, at least in one area or level of communication. True bilingualism, or fully fluent or balanced bilingualism implies a functionally sufficient command of two language systems with regard to phonological, grammatical, lexical, and pragmatic abilities. Only with respect to balanced

bilinguals is it possible to consider the effects of bilingualism on cognitive growth.

Contrary to earlier indications more recent findings confirm that bilingual children appear to have a mental flexibility, a superiority in concept formation, and a more diversified set of mental abilities (Peal and Lambert 1962, Bain and Yu 1978, and other researchers).

More particularly it has been claimed that "metalinguistic awareness is the primary variable mediating the positive effects of bilingualism on academic achievement. The argument, in summary form, is that fully fluent bilingualism results in increased metacognitive/metalinguistic abilities which, in turn facilitate reading acquisition which, in turn, leads to higher levels of academic achievement" (Tunmer and Myhill 1984, 176). Metacognitive abilities imply the habitual capacity to reflect upon and manipulate thought processes, while metalinguistic consciousness implies the ability to reflect upon and manipulate language concepts and functions. The suggestion is that the process of conceptually separating two languages into functionally independent systems results both in an increase of metacognitive ability and in the strengthening of metalinguistic awareness. In support of this suggestion are several recent studies which seem to indicate that bilinguals do, in fact, enjoy superior metalinguistic, as well as metacognitive, functioning (e.g. studies by Ben-Zeev 1977, Inco-Worrall 1972, Cummins 1978, Feldman and Shen 1971, quoted in Tunmer and Myhill 1984, 177).

1.2 Early bilingualism and reading

There is sufficient evidence that reading acquisition depends to a very large extent on the development of both metacognitive and metalinguistic abilities. In other terms, the development of conscious control of perception and cognition on one hand and of the formal aspects of language on the other play a central role in learning to read. More specifically, it can be stated that efficient learning to read requires good phonological awareness (recognition and distinction of sounds or phonemes), distinct word awareness, sufficient form awareness (i.e. conscious control of grammatical forms and functions), and pragmatic awareness (or ability to use and appropriately select communication rules in pertinent situations).

Furthermore, "the view that metalinguistic awareness is a prerequisite skill is not inconsistent with the possibility that reading instruction increases metalinguistic awareness, which would explain the sharp increases in metalinguistic abilities often observed among beginning readers" (Tunmer and Bowey 1984, 167).

On the other hand, it remains true that balanced bilingualism enhances, in turn, metacognitive and metalinguistic development in very young children (4-8 years of age). The argument then could be phrased as follows: both bilingualism and reading are stimulated and fostered by the gradual acquisition of metacognitive and metalinguistic competence and cognitive development to a very high degree and at a very precocious age level. A great many findings support the conclusion that learning to read as early as from the age of three results in greater intellectual flexibility, conscious cognitive control, richer linguistic competence as compared with illiterate peers (see Doman 1964/1975, Cohen 1977). It is therefore safe to infer that early bilingual reading ability should have a strong impact upon the child's

cognitive and linguistic growth.

1.3 Early bilingual growth: an objective of basic education

"It is more and more widely granted today that interethnic communication and world-mindedness are basic needs of the cosmopolitan citizen of the future. A defence of this statement will be superfluous. The progress of human civilization depends on producing a generation of peace-makers, peace-lovers, and peace-bearers. It is also unquestionable that democracy is built upon education for personal as well as international understanding and cooperation ... But it is essential, also that the "New Man" of civilized society will have to be a creative learner, endowed with an ability to decode cultural and moral messages from all the experiences of humankind. Now these axioms imply a rejection of monoculturalism and of its allied state, monolingualism, taken in its narrowest sense. They also demand that we take a new look at basic education. Education, understood as the formation of the human personality in its fundamental dimensions, will have to step beyond the mere teaching of the "three R's"; it will have to reflect concern for the socialization of the human infant, and his ethical orientation in the world of values. It will demand a basic capacity for communication and will seek to promote a sensitivity to the diversity of cultures and languages" ... "I believe that ... bilingual education must seek to ensure personality formation and mental health, broad-mindedness in solving human problems, flexibility in strengthening intellectual powers, and metalinguistic awareness" (Titone 1984, 7-8).

Now reading is considered most rightly to be central in the instrumental system leading to general education. Therefore, no doubt bilingual reading can become the main source for all-round personality formation, intellectually, emotionally, and socially.

Among other authors, it is encouraging to find in Donaldson's book *Children's Minds* (1978) the suggestion that a better induction into formal activities such as reading will aid the child in grasping the formal or disembedded character of thinking which schooling demands. In Donaldson's view, reading in particular will contribute to language awareness. Much more so with bilingual reading, which, if carried out since very early childhood, will certainly lay the foundation of open-minded education at an age when prejudices are still unknown.

2 Retrospects: case studies of Early Bilingual Readers

Theodore Andersson, in his captivating booklet *The preschool years* (1981) on family reading in two languages, starts off by quoting Burton White who expressed with emphasis his belief "that the educational developments that take place in the year or so that begins when a child is about eight months old are the most important and most in need of attention of any that occur in human life" (1975: 129-130).

It is particularly up to the point what Benjamin Bloom reports after extensive research, namely that "Put in terms of intelligence measured at age 17, from conception to age 4 the individual develops 50% of his mature intelligence ... This would suggest the very rapid growth of intelligence in the early years and the possible great influence of the early environment on

this development" (1964: 68). All this amounts to underscoring the unique importance of early reading carried on while the child's brain shows a high degree of plasticity and undifferentiation.

2.1 The case for early reading

The movement in favour of early learning to read is becoming impressive and covering many different countries. The starting point was signaled by the marvellous experience initiated by Glenn Doman with his book *How to teach your baby to read: The gentle revolution* (1964), which recounted convincing principles and fascinating cases. According to Doman,

1. Tiny children want to learn to read.
2. Tiny children can learn to read.
3. Tiny children are learning to read.
4. Tiny children should learn to read (1964: 9).

Facts proving the truth of Doman's assumptions are numberless. Doman acquired valuable experience with early readers, which he set forth persuasively in his popular book, addressed to mothers. In it he declares: "Children can read words when they are one year old, sentences when they are two, and whole books when they are three - and they love it" (1964:1).

Following Doman many educators since the early Sixties have tried out his method or similar ones and have reached wonderful results. Andersson (1981: ch.II) quotes twenty-three instances of which at least five are not mere case studies but experimental investigations. Beside Doman's name, the names of Söderbergh, Jane Torrey, Goodman, Fries, Durkin, Terman, Cohan, Fowler, Hughes, Lado, Callaway, Steinberg, Emery, Witte, Ledson, Smethurst, Perlish, Taft Watson, etc., have become widely known as marking significant milestones in the history of the movement.

Beside these cases related to home influence, some investigations can be quoted, like the one conducted by the Denver Public Schools (1961-62) and another reported on by Harvey Neil Perlish (1968) on the effectiveness of television reading programmes, or the CRAFT Project (Harris et al. 1968) on a comparison of academic achievement of early readers and non-early readers, or especially Durkin's first study (1966) on the achievement of early readers from first grade to the end of grade six. The main conclusion was that "over the years, the early readers in this research continued to show higher achievement in reading than the non-early-readers with whom they were matched" (p. 110).

Andersson's accounts of early reading are far from exhaustive. In Europe the movement has found followers. A rather detailed account by Schmalohr (1973) reviews several home case studies (Kratzmeier 1967, Walter 1967) and also institutional investigations carried on in kindergartens. Of particular interest is the experiment organized by Luckert (1967, 1968) with the cooperation of 240 families on two-year old children. Specific studies (by Schmalohr 1969, Schuttler-Janikulla 1969, Brem-Graeser 1969, Rudiger 1970, Wilke-Denig 1972) aimed at examining young children in school settings so as to ascertain the effects of early reading on intelligence, language development, socio-emotional growth, long-range reading ability. Results were by and large positive. (See reviews in Schmalohr 1973).

But one of the best experiments was carried out by Rachel Cohen in France (1977) and reported on in her book *L'apprentissage précoce de la lecture*. The children tested were 161 and their age range between 3;8 en 4;11. The use of a multiple test battery evidenced that young children of preschool age can learn to read, and secondly that reading can help them to develop their ability to grasp and formulate basic concepts.

Finally, it can be added that since 1976 the Chair of Educational Psycholinguistics, University of Rome, Italy, headed by R. Titone, has assigned five experimental doctoral dissertations (partly published) dealing with early reading projects carried out in different kindergartens throughout Italy. Two conclusions have been defined as a result of such investigations: (a) children can learn to read from the age of three; (b) their intellectual improvement can be seen as a result of proper reading instruction (in comparison with control groups of non-readers); (c) reading can be taught in kindergarten settings by well-trained teachers (Annessi 1979).

2.2 The case for early reading in two languages or Early Bilingual Literacy (EBL)

What kind of relationship can there be between preschool reading and the bilingual child? Andersson, on opening chapter II of his book (1981:31), rightly comments:

"If a monolingual child can get a headstart by learning to read before going to school, why can't a bilingual child get a double headstart by learning to read two languages before entering school? No one would deny the educational importance of skill in reading; nor would many deny the advantage of a knowledge of two spoken languages. The theoretical advantage of knowing how to read and write in two languages would seem to be self-evident, and yet biliteracy is rarely emphasized as an objective in our schools".

In order to examine more closely the psychological aspects and the educational outcomes of early bilingual reading, Andersson (1981: 32-45) presents three cases of preschool biliteracy.

Mariana and Elena Past have learnt to read in both English and Spanish, the former beginning at age 1;5, the latter at about the same age. Word games with word cards were used following approximately what Doman suggests in his method. During her third and fourth month of reading Mariana was already skilled in reading sentences, and she was frequently reading independently. At age 3;8 she was reading English at the level of the average first grader in the second half of first grade. The same was revealed with regard to Spanish. At age 4;11 here entering a bilingual kindergarten did the rest.

Raquel and Aurelio Christian also learnt to read English and Spanish very early. At 8 months Raquel had already asked her parents the names of the letters as they bought her an alphabet book in Spanish Aurelio took no interest in the alphabet until much later, but absorbed words by mere association. Neither child had such interest in reading books of any length until about five. Reading Spanish at home transferred to reading English when they entered school. Later progress in grade school was excellent for both children.

Yuha and Chinha Ok Ro Lee are Korean/English bilinguals and biliterates. Since Yuha's development in Korean was far in advance of her development in English, her father decided, in order to prepare her for kindergarten, to initiate her into reading in English, her weaker language. Yuha liked to watch TV, especially "Sesame Street", and learned all of the letters of the English alphabet. Then her parents taught her reading systematically. She learnt how to read first in English, while the language of instruction and explanation was Korean. But later on, in one month, thanks to a special programme, Yuha learnt to read and write Korean just before she became a first grader. Lee observes that at the end one-month instruction Yuha's skills in reading and writing of the Korean language were better than her corresponding English skills. Biliteracy is more than just knowledge of two languages; it implies behaving properly in two cultures. In fact, Lee writes about his daughter: "She speaks and behaves like Korean among Koreans. Early bilingual reading seems to have aided her for her bilingual and bicultural adjustment in the United States" (Lee,1977: 143-144).

Andersson submits the following correct conclusions:

"The experience of the children in the three bilingual families ... suggests that, far from being a double burden, learning to read in two languages is a double joy, leading to a positive self-image.

The term "early" in the expressions "early reading" or "early reader" is seen to vary all the way from age six months, as with Kimio Steinberg, to nearly five years, as in the case of Yuha Lee, suggesting that this concept is, or at least can be, quite flexible.

One notes significant uniformities among the parent-teachers involved in the cases I have cited. They exert no pressure on the child; rather they try to sense what will interest the child. The parent-teacher's task seems to consist in reading the child's wishes and in inventing games to stimulate this interest. Successful parents seem to include their young child in their conversations and activities.

Above all, early reading appears, as in the case of Yuha Lee, to be related to establishing a sense of personal and social values. Parents who read, study, and discuss interesting or important subjects in the presence of their children and who answer their children's questions create a close relationship with their children, a relationship which older children are quick to adopt with their younger siblings" (1981: 44-45).

Experiences and investigations on early bilingual reading are taking impetus now as is documented by research reports and the launching of the new IPRA (International Preschool Reading Association) Newsletter Among more recent reports it is worth considering what Els Oksaar, University of Hamburg, has tried to check with her investigation on a group of bilingual children (1984). Of the 20 bilingual children (from middle and working classes) who grew up hearing and speaking German and Swedish, or German and English, or Swedish and Estonian, 13 (65%) could read and write both languages more or less fluently by the age of four to five years. In the control group of six monolingual German or Swedish speaking children, four (67%) demonstrated this ability.

She adds that of the 13 children in her project who learned to read two languages before they were 5 years old 10 children were not exposed to

any one particular method, but rather a sort of methodological pluralism, in which the interaction between the child and mother or other reference person played a dominant role. The children were read aloud in both languages very early, following the well known rule "one language - one person"; they knew much of this by heart and, finally, wanted to read themselves.

Furthermore she notes that in bilingual marriages the children usually learn to read first in the language of the mother or in the family language. The fact that in learning to read the second language, they had no difficulties, and progressed even more quickly than in the first language, would seem to support the generally accepted statement that children actually only have to learn to read once, and that this skill can be transferred from one language to another.

The transfer effect from one language to the other is also confirmed by Hélène Businger (1984) when she writes about her bilingual child that "his ability to visualize and memorize words was transferred to the second language and he succeeded in reading with (her) a short book in English entitled *Teddy Bears 1 to 10*. So the experiment has had a very positive effect on his bilingualism. It has also encouraged him to become biliterate" (p. 8).

With regard to method it is worth recalling what Nguyen Ngoc Bich (1984) writes in concluding her report on the progress in reading of her Vietnamese-speaking child, Victor Quang.

"The element of play - she remarks - is an integral part of the learning process of young children; one needs to start with vocabulary that is not only simple from the linguistic point of view but also is immediately recognized in the child's environment; comprehension and miscue analysis are all very important parts of teaching as one tries to structure the child's learning environment. And, of course, it is of primary importance that the child be allowed to test and use his creative power to develop new sentences and gain a sense of power, of ownership. Thus, far from being a passive process of decoding and understanding only what is there, the reading process should be seen and allowed to be the creative process it has always been" (p. 8).

Now the question is: can bilingual reading be taught in pre-elementary schools by teachers? And why not use early bilingual reading instruction as a means to aid disadvantaged children like migrants' children? The answer to such questions can be given only by institutional experiments to be carried on with larger samples of young subjects. It is this perspective that will now be illustrated.

3. Prospects: a research project on early bilingual literacy

I will try to summarize the main lines of a research project designed by the writer aimed at developing the experimental conditions for teaching early bilingual reading in institutional settings. The essential traits of this project have already been outlined in a previous essay (Titone 1983).

3.0 The Early Bilingual Reading experimental project

Stepping from mere experience to scientific experimentation means defining more accurately objectives, materials, instruments, and evaluation measures.

It is advisable: (a) to clarify the basic issues connected with early bilingual reading (during the preschool years), its psycho-educational aspects, its advantages and possible draw-backs; (b) to prepare a transition from mere occasional experience in family circles to true scientific experimentation in kindergarten and/or nursery schools; (c) to design and build appropriate teaching materials linked with child motivation and language abilities.

The present author has built special materials (a reading kit and guide book for parents and teachers) for teaching playfully to read in two languages simultaneously (viz. Italian/English; Italian/French; Italian/German; Italian/Spanish is being prepared; Castilian-Spanish/Basque is being tried out). Discussion of the experimental paradigm follows.

3.1 Aims of the research

This research intends to check: (a) the possibility and effectiveness of simultaneous learning to read in two languages from the age of 4 years (in any case before 6); (b) the correlation between early literacy and bilingual development; (c) the correlation between early biliteracy and cognitive development; (d) the correlation between early bilingual literacy and the overcoming of cognitive and linguistic disadvantages of lower-class or immigrants' children.

3.2 Research methodology

The experimental control of the above variables will consist of the following procedures:

- (a) pre-testing verbal intelligence and ascertaining the non-existence of reading ability at the start;
- (b) the systematic use of appropriate readings materials prepared by R. Titone, viz. the "Early Bilingual Reading Kit" (Titone 1977): the materials should be applied for at least one school year;
- (c) post-testing bilingual reading competence on the basis of the above material.

Special scoring scales are being produced in order to compare individual results. Subjects will be assessed with respect to age, sex, socio-economic level, learning motivation, IQ, rate of oral language development. Raw scores will be processed by Titone's research team. Teaching can be carried on also by parents if competent; but as a rule kindergarten teachers will do the teaching under supervision.¹

3.4 Evaluation instruments

The following data and measures will be collected:

- (1) Intelligence pre-test: the Wechsler Intelligence Scale for Children at preschool age or another equivalent verbal intelligence test can be used.

To be administered before starting the experiment.

(2) Bilingualism pro-test: for checking linguistic competence in L1 and L2 on the basis of visual or motor stimuli (picture test). Verbal responses in terms of short narratives will be evaluated as to:

- (a) phonological correctness;
- (b) grammatical correctness and completeness;
- (c) lexical richness (quantity and appropriate use of words);
- (d) verbal fluency.

Practically, one should check for:

- (a) number of pronunciation errors on the total of words;
- (b) number of errors on the total of sentences;
- (c) number of words and number of errors of meaning on the total of words;
- (d) rhythm (fast, middle, slow) of utterances.

(3) Pre-reading test: reading of one's own first and last names printed on the blackboard or on cardboard (in capital letters).

(4) Reading post-test: based on the reading material of the last booklet presented in the kit: check speed, correctness, comprehension (total number of errors).

(5) Bilingualism post-test: the same initial picture test: check number of words, sentences, descriptive details with comparison with initial results (pre-test).

(6) Intelligence post-test: by means of the same initial test in an alternate form.

(7) Questionnaire: to be submitted to both parents and teachers (see below).

3.5 Questionnaire on early bilingual reading experience

The questionnaire can be administered orally or in writing.

1. At what age did your child begin to speak?
2. When did he/she begin to find amusement in scribbling?
3. When did s/he show interest in writing or in written things, like: neon signs? advertising in TV? posters? comics? words connected with pictures? ... (Please indicate age in general, if remembered, for each type of objects).
4. At what age the first reading took place: in one language? in the other language?
5. What did s/he learn to read: in one language? in the other language?
6. Did s/he show fast/ or slow progress?
7. How often does s/he show the desire to read? - during the day? (number of times) - during the week? (number of times)...
8. How long does his/her application to reading last? - less than 10 minutes? more than 30 minutes?...
9. Has s/he been undergoing an ebb and flow process in his/her reading interests? - In what period of age (and for how long) did s/he keep his/her reading interest alive? - In what period of age (and for how long) did s/he neglect or reject reading? ...
10. What is his/her present degree of interest in reading? - high - middle - low ...
11. Are you in favour (or against) reading at preschool age? Why? ...

3.6 Teaching method

The general hints given here refer to Titone's Bilingual Reading Method as materialized in the reading kit (published by A. Armando in Rome). However, keeping these indications in mind, other types of materials can be designed, especially if the two languages do not include Italian. The present hints concern the general teaching approach, some basic suggestions, and the use of the material.

One preliminary question: Is reading in two languages really easy? In order to answer this question we must first point out the activities which facilitate the child's learning to read in a single language:

1. Search and naming games for objects, animals, loved persons; games dealing with the inexhaustible curiosity towards an environment where surprise is continuous, where the unknown is a potential for personal conquest.

2. Global attainment of some realities and later tentative analyses: in the kitchen, tools; in the garden, plants; in the train, wheels; in dolls, legs, arms, head, etc.

It is no different in the handling of bilingual reading: some basic activities come into play in enjoyable games which solicit spontaneous curiosity towards:

1. the oral and written knowledge of words or sounds having to do with objects, animals, people of particular interest;

2. the global perception of easy sentences dealing with the child's experience, i.e. well defined, known objects of certain interest: one's own body, a toy, family members ...

Objects which are not familiar or words which are not yet possessed in the oral form should be avoided, as should single letters totally isolated from the context of a phrase or sentence. The spoken and known must always precede the written.

Our method implies some preliminary suggestions such as the following:

1. Begin with a game or pleasant conversation.

2. Focus upon a word or a sentence in one of the two languages, writing it on a card or indicating it on the appropriate chart or in a booklet (see Titone's material); read it aloud and have the child repeat it.

In the first phase one should not worry about having the child distinguish between the single letters. These will be discovered spontaneously by the child and one can, in any case, point them out later in the written or spoken word.

3. The main method of teaching a child a language is through play. Everything should appear like a game of discovery and invention in which words, and later letters, serve to construct sentences, as if it were a question of placing one block upon the other, brick upon brick ... Many spontaneous games can come about through the child's initiative, others may be invented by the educator.

The games may be numerous and varied. Some may be of the following types: matching the card with words and then later with sentences; rapid reading contests; finding the right card as in a game of cards; action cards, like in Montessori's "command game"; sentences to construct: - in this case cards with words or sentence pieces should be used; the child is asked to read, understand, link up the single cards in an order in such a way as to make up a sentence. When he is finished, he reads the whole constructed

sentence aloud.

The material included in the box prepared by R. Titone (1977) is divided as follows:

1. The words "mommy" and "daddy" on two separate cards which have the word written in L1 on one side, and the word written in L2 on the opposite side.
2. Twenty words dealing with the child himself, each on a separate card, in both languages.
3. Basic vocabulary relative to the immediate world of the child.
4. Essential vocabulary for the formation of sentences.
5. Vocabulary to be inserted in structured sentences.
6. Four booklets for progressively difficult reading, having a series of pictures, each of which is coupled with a sentence in both languages.
7. The alphabet in both languages, with references to words of immediate use.

The subdivision of the material corresponds to an exact grading of difficulty to be met with by the child.

As educators (parents and teachers) have found out, the child does not find it strange that objects and actions are not only said in two different languages, but are also written and read in two different languages. If, in fact, he lives in a bilingual environment he will be ready not only for hearing sounds, words, and sentences in two languages, but also for seeing books, magazines, comics, printed matter of all sorts in two languages as well.

Detailed instructions on how to go about in each phase are given in the Guide accompanying the material (Titone 1977). Basically the instructional method is grounded on the assumption that optimal learning takes place when there is harmony between:

- Visual Sensations (V)
- Auditory sensations (A)
- Tactile sensations (T).

The VAT language learning system emphasizes the fundamental aspects and factors of an easy means of learning bilingual reading based on the use of:

1. the visual (recognition of the forms of words),
2. the auditory (association of sound and written word),
3. the tactile (touching the cards on which the words are written) as a pattern of meaning integrated by the direct and joyful experience of the child interacting with the adult.

One step at a time, one word at a time, one sentence at a time, one page at a time! The material is never shown all at once to the child, nor the successive parts shown before the preceding step has been conquered.

3.7 Concluding remarks

Who are the targets of this early reading method?

At this moment the use of the Early Bilingual Reading Kit by R. Titone is recommended and being used with children from the age of four living:

- (a) in bilingual families;
- (b) in bilingual or multilingual areas (in Italy, especially the French-Italian speaking area of Valle d'Aosta, the German-Italian area of Alto Adige/Bozen; in the Basque Country);

(c) in immigrants' children's homes or schools.

However, a few attempts are being made in bilingual or international kindergartens (Turin, Milan, Rome). Results are not yet available due to the short time elapsed since the beginning of the experiment, although the impressions gathered from parents and educators are so far favourable.

It is noteworthy that Titone's method and material has been adapted to an experimental project which is being carried on in the Basque Country with Basque-Castilian bilingual children (ages 4 to 6). The coordinator, Dr. Antton Kaifer Arana, has translated and adapted the Early Bilingual Reading Kit into Castilian and Euskara and is using it to teach a large number of children reading in both languages at the same time. The project will achieve the result of strengthening command of L1, namely the Basque language, which has lost ground in recent times. The project is stimulating wide popular interest. The first results are expected by the end of 1986.

No doubt many problems are still open to discussion and research. But the writer believes that there is sufficient warrant for positive confirmation of the main hypotheses outlined at the beginning of this writing. In particular, it is believed that great advantages will be achieved on behalf of the maintenance of bilingual competence in immigrant children in many countries. This expectation seems to be fulfilled by an attempt of applying the method to Italian immigrant children in some German-speaking areas of Switzerland. Promises are substantial. This opportunity cannot be missed.

Note

¹ Standard materials are published by Armando Armando Editore (Via delta Gensola, 60-61 - 00153 Roma, Italy). Each kit will serve for more than one child (two or three, no more).

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PSYCHOLINGUISTICS AND SPEECH LANGUAGE PATHOLOGY: THE CURRENT STATUS OF RESEARCH IN THE USA

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One of the first signs of closer approximation of the two disciplines is the progress that psycholinguists have made in the understanding of normal child language through the recording and analyzing of children's naturally occurring utterances (Wellman and Somerville 1980) and the increasing use of naturalistic context in obtaining a representative sample of children's language in a communicative context (Miller 1981). There remains, within the discipline of human communication sciences and disorders, a dichotomy between research conducted in natural contexts and that conducted in the clinic or laboratory. As the field of speech correction has evolved, researchers and practitioners in the two sub-specialities, i.e., speech-language pathology and audiology, have retained a strong interest in laboratory research. As Butler (in press) has noted:

Basic researchers remain in their laboratories and practitioners find it difficult to apply (research) results to problems of the moment. There are applied researchers who attempt to bridge the gap between laboratory, the clinic and the schools. The concept of the clinician-researcher (or researcher-clinician, depending on one's priorities) is frequently applauded as the desirable blend of science and service. Too few exist but that is undoubtedly symptomatic of most disciplines where there are clinical/ educational, as well as research, components. The so-called great clinicians of an earlier era represented this ideal, combining ongoing research and clinical activity. This is how research in communicative sciences and disorders began. Perhaps we shall return to it in the future, albeit in a modified and more sophisticated manner.

It is of particular interest to me that many of those here present are currently intimately involved in the researcher/practitioner role. Applied psycholinguists, by the very nature of their subdiscipline, have retained an all-consuming interest in both practice and research, as could have been seen from a glance at the main subject of the 1st Congress of Applied Psycholinguistics (Barcelona, 1985) and the selection of "section presentations".

It would be impossible to encapsulate the many strands of language research within the confines of this presentation. Many fields have witnessed a "knowledge explosion", but the research in language acquisition and its

disorders is almost nuclear in nature. Conceptualizing the breadth of research adequately requires an interdisciplinary perspective (Butler, in press), as well as the ability to hold opposing theoretical models in mind simultaneously. For example, it is helpful to recognize that developmental psycholinguists are addressing issues of communicative competence in what has been defined as the post-Chomsky era (Schiefelbusch and Pickar 1984). Among the issues Chomsky raised were those of (1) a specific set of rules that underlie sentence construction and (2) the child's innate knowledge of, and capacity for, linguistic universals. Thus, as Bowerman (1982) has pointed out, during the 1960's Chomsky's formulations guided a large number of language investigations in the exploration of children's knowledge of the linguistic code. By the 1970's, some investigators (Hymes 1971, Cambell and Wales 1970) voiced concern regarding the preoccupation with linguistic competence, noting that linguistic knowledge reflected only one aspect of competency, and tended to ignore the cultural contexts in which utterances occur. This reformulation of the definition of communicative competence led to an expansion and modification of Chomsky's original meaning of competence to include a cognitive and pragmatic emphasis.

Communicative competence has come to be characterized "as the totality of knowledge that enables a speaker to produce utterances that are structurally well formed, referentially accurate and contextually appropriate" (Schiefelbusch and Pickar 1984, 4). The cultural analysis of language acquisition in the United States was highlighted in the late 1960's and '70's by an emphasis on the cultural analysis of language acquisition within a cross-cultural context (Slobin 1967). Indeed, it is now generally accepted that spoken language requires not only an understanding of referential meaning, but also of conveyed and situated meaning, i.e., the meaning of an utterance through its use in different semantic contexts and the features of context or situation as meaning is negotiated by the participants, utilizing their shared knowledge of social and cultural conventions.

In the United States, there has been a growing awareness of the implications of this research for identifying communicative competence among the growing number of speakers whose first language is not English. Considerable difficulty, however, has been encountered, in attempting to reliably measure second language skills in placing children in bilingual classrooms, or for identifying an individual's communicative competence for exiting such programs (Day 1981). As Day points out, the new emphasis in linguistics has interested those charged with assessment responsibilities to seek to analyze the functional use of language through "integrative" tests of language proficiency, with the thought that more global measures would predict an individual's actual performance in a second language with more accuracy than previously used discrete point tests. (Four integrative language assessment instruments currently in use include the Foreign Service Institute Oral Interview (Wilde 1975), the Savignon Communicative Competence tests (Savignon 1972), the Ilyen Oral Interview (Ilyin, 1976) and the High/Scope Instruments (Bond et al. 1977). Only the final instrument was designed for assessment of children's competence.

Omark (1981) presents a current dilemma. He notes that while the conceptual basis for evaluating a child's pragmatic behavior has changed, most of the testing instruments have not. Noting that speech act theory has been a contribution, he also points out that there appear to be about 1,000 possible illocutionary acts (Searle 1969, 23), and recognizes the unlikelihood that one would be able to assess more than a few dozen of such acts.

Omark cites four major difficulties in assessment within a pragmatic framework:

1. Different settings have different effects on children's linguistic behaviors.
2. The dominance hierarchy in any of those settings may have differential effects on linguistic interaction.
3. While assessment without knowing the language is sometimes possible through observational procedures, either the examiner must have some knowledge of the language or an interpreter (either parent or professional) must be used.
4. Finally, some method of objectifying the observer's findings must be utilized when discrete point tests are not utilized.

(Omark 1981, 258-259)

A number of techniques for acquiring an understanding of the child's linguistic and pragmatic skills have been identified. They include: (1) focal child sampling, whereby a single child is observed for extended periods of time, at repeated intervals, (2) scan sampling, wherein only broad categories are recorded and a profile of, say, typical classroom group behaviors can be identified, particularly when conducted two, three or more times a day, (3) matrix completion in which groups of children are observed in some kind of communicative interaction (Omark 1981). As can be easily seen, such ethological techniques are in their infancy.

Walters (1981) has commented that the role of context in language use is "an area of investigation marked more by variability than by agreement". Among the linguists, sociologists, sociolinguists, and psycholinguists who have studied the context of conversation, very few have even referred to the definitions of others, let alone concurred with them. In fact, less than a handful of researchers in these fields have systematically treated the concept labeled 'context' (p.221). *Sociological approaches*, i.e., descriptive sociological analysis, has primarily looked at the rather limited goal of formulating the parameters of the social situation in conversation, while *sociolinguistic approaches* tend to deal with the speech community, the speech situation, speech events, e.g. a conversation, and speech acts as the social units of analysis (Hymes 1967). Within this general framework, Labov (1971) has claimed that socioeconomic class and contextual style are the primary determinants of language use, with age, sex and ethnicity contributing only secondarily. Recent *psycholinguistic research* has provided some similarity in the definition of context as restricting the concept to knowledge shared by the speaker and listener (Doré 1977, Garvey 1975, Searle 1975). Garvey's interests in context are reflected in his research on discourse analysis, i.e., the sequencing of two or more utterances, while Doré's primary focus is on the communicative intent of the speech act. Others who have made major contributions include Ervin-Tripp (1976), Bates (1976) and Shatz (1977), with the latter focusing upon politeness as an aspect of pragmatic competence.

Some recent work (Walters 1978) has utilized puppets as "addressees" to which a child makes certain requests during 2 minute language samples in an experimental situation. This approach is essentially observational, and occurs in a quasi-naturalistic setting. Settings and topics include scripts that relate to child behavior in supermarkets, with lunch money, outside at play, and outside selling cookies.

It is thought that "having the child produce or comprehend requests and other speech acts in a variety of contexts" (Walters 1981, 243) permits the evaluation of semantic variation in a variety of communicative contexts, and permits an analysis of lexical and morphological data. Interestingly enough, Walters does not address the issues raised by his use of scripts and schemas from an information processing perspective. Scripts, because they tend to reflect simple, stereotyped situations, require that the child only be able to retrieve from memory knowledge units that are more-or-less automatic and that permit interpretation and prediction of ongoing events based upon recovery of past events. The examiner may not be able to make judgments, therefore regarding the child's performance in less stereotyped circumstances. Thence, it is possible that one would wish to consider not only the use of script-like assessment procedures, but add a "testing-of-the-limits" session where the examiner moves beyond the level of well-known contexts into those less well-known. This will reflect more closely the demands of instructional discourse, which tends to be decontextualized.

Moving on from consideration of the bilingual child and the influence of current research on possible assessment procedures, it must be remembered that the whole area of very early language development is important to a discussion of speech and language disturbances. Children come to school with a substantial history of language interaction with parents and caretakers in the preschool years (Heath 1982, Lieven 1984, Sugarman 1984, Snow 1982). As noted previously, "major reorganizations have occurred in the last 20 years in people's thinking about language development. First, the focus of research (and remediation) has shifted from the child as the unit of study to the dyad - the mother-child or the teacher-child dyad. These two shifts are, of course, related and complementary. When viewed in the context of the dyad, the child's behavior can be assessed for its communicative effectiveness as well as for the correctness of its linguistic form" (Snow 1984). The importance of "speech input" and its relationship to children's learning has become another focus of intensive study.

For researchers and clinicians interested in language disorders, in addition to all that has come before, there must be more than a nodding acquaintance with neurological and physiological development (Daniloff et al. 1980) and neurological disorders (Kertesz 1983, Maxwell 1984) as well as brain dysfunction (Bryden 1983, Butler 1984b, Segalowitz 1983). For those whose primary focus is oral language, knowledge of how auditory information is thought to be processed in the brain is essential, including a solid grasp of cognition in an information-processing model (Arbib et al. 1982, Butler 1984c, Nelson 1984).

As if the above were not sufficient, there are additional parameters to be considered. To what purpose would we, for example deal with language if it were impossible to understand how language is coded, stored, and retrieved from memory?

It is this author's contention that close attention must be given to how language is processed - how it is presented orally, or read in its orthographic form - how it comes to be perceptually and conceptually recognized - how it takes on meaning. While other disciplines are interested in how a child may be able to comprehend and integrate new incoming information with old information stored in long term memory, and the forming of new mental representations in an orderly manner, the discipline of human communication sciences and disorders is centrally concerned with deviations and disturbances of language. The pre-eminent position of memory processing

must place it high on our "language list". (To review research that highlights this point of view, see Ornstein 1978 and Perlmutter 1980).

In viewing the present status of language measurement, one must note that Piaget has supplied the primary framework for studying the development of communication skills (Dickson 1983). Psychologists, speech-language pathologists, and child language researchers have all attempted to utilize the Piagetian framework. However, as Dickson (1983, 30) has reported: "Piaget's pessimistic view of children's communication skills was brought forward into research in the United States. From the mid-1960's to the mid-1970's research on the development of communication skills followed Piaget's view". More recently, this view has been thought to be too limited, although disenchantment has come slowly. Menyuk (1975) noted that there were inherent difficulties in forcing linguistic and nonlinguistic formulations into congruency, and that there was little reason to assume that linguistic performance should be entirely dependent on the appearance of specific nonlinguistic operations. In addition, work done in the 1980's is now based upon modern working memory models, although Piagetian tasks may still be utilized. It would appear from current research that successful performance on such tasks may be the result of activation of a system that is dependent upon encoding of some crucial background facts, i.e., what past experience and knowledge provides, as well as the ability to hold such information in short-term memory until the task is completed (Brainerd, 1981).

In fact, Brainerd's later work (1983) convincingly shows that children's ability to succeed may not necessarily be attributable to Piagetian stages of development, in and of themselves, but may result from cognitive strategy training via feedback, attentional training and so forth.

If space permitted, it would be fruitful to discuss such areas of research as those related to referential communication, to metacognition, metalinguistics, and metamemory, and to examine the speech and language disturbances of specific subgroups of children: the retarded, the autistic, the hearing-impaired, the blind, and the learning disabled, as well as those now termed "severely/profoundly" handicapped. Each of these special populations exhibit certain kinds of speech and language disorders or disturbances. Each represents an overlapping area of study, with certain unique aspects relevant to the primary nature of the specific disorder, and each deserves our attention. In the interest of allotted space, however, it may be wiser to turn to the research issues of the future.

An abbreviated version of such issues might include the following:

1. While research in phonology, syntax, morphology and semantics will continue unabated, there is a need to look beyond pragmatics to the ethology literature. As Becker (1984) has suggested, "ethologists do not usually concern themselves with language ... Conversely, psycholinguistics do not concern themselves with ethology" (p.2).
The study of the human organism through descriptions of prototypical behaviors in a natural context will reveal much about the function of language.
2. The role of semantics and lexical access and retrieval is also a research arena of considerable import (Jackendoff 1983).
3. Contrastive studies devoted to the language of atypical as well as typical children are to be encouraged. As Friel-Patti and Conti-Ramsden (1984) suggest, research efforts in regard to atypical learners has been frequently fragmentary. Research regarding the development of atypical

language learners over time, e.g., longitudinal studies, have been almost non-existent.

4. If both Chomskian and Piagetian frameworks are less than ideal for the investigation of language acquisition and disorders, it may be that we need to survey the disciplines of cognitive psychology, information processing, anthropology, ethology, and so forth for new directions, or at the very least, new understandings.
5. As noted throughout this article, the study of language acquisition and disorders is constrained by the perceived borders of various disciplines. This may contribute to a narrowness of research that defeats our very purpose. While acknowledging professional boundaries, one should also acknowledge cross-discipline fertilization. The study of language is an immense undertaking. Perhaps the old question remains: How does one eat the elephant of language? And perhaps the old answer also remains: "One bite at a time". In this case, we have been busily defining the outlines and the shape of the elephant. It is probable that collaborative gustatory initiatives among and between disciplines will need to be considered.

If the analogy of the elephant appears unappetizing, perhaps another could substitute. Since the pioneer days of America, borrowing small amounts of needed food or objects has been customary. Until recently, "borrowing a cup of sugar" has been an integral part of suburban community living, although in today's world, that may have escalated to a video-cassette recorder or a riding lawn mower. In any case, professionals who provide language intervention have long looked to other disciplines beyond their own for much needed assistance. So too have researchers. All have chosen to "borrow" from psycholinguistics and applied linguistics, as well as from developmental psychology, sociolinguistics, and cognitive science. "In actuality, countless cups of sugar have been borrowed, beginning with the days of transformational grammar. The search for improved methodologies for treating phonological, morphological, syntactic, and semantic disorders has made especially profitable use of a good deal of normal language acquisition research techniques ... The area of language in context (i.e., pragmatics) is the most recent arena wherein speech-language pathologists seek research information." (Butler 1985). Just as it has long been traditional for the borrower to repay the lender in kind, it is perhaps possible that the growing interaction between researchers in normal language acquisition and those whose interests lie with atypical language learners may result in substantive interdisciplinary research efforts, yielding further knowledge regarding communicative competence.

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ANALYZING LANGUAGE PROCESSING THROUGH PROTOCOLS ON VERBALIZATION*

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Introduction

A state-of-the-art résumé on the use and psychological validity of introspective data in psycholinguistic research has long been overdue, in spite of the seminal 1980 article by Ericsson and Simon. The Ericsson and Simon 1984 volume, to be sure, for many years to come will be taken as the generally appreciated realization of this desideratum.

Language processing is discussed in various portions of this book, explicitly and implicitly. However, the work that has been done in first and second language acquisition research is widely overlooked.

There may be various reasons for that. Cognitive scientists, unfortunately, have little contact with applied linguists and psycholinguists. Much of the work that has been done in this area has started in Europe only just recently and simply was not available at the time of the production of this book. Or is there a fundamental difference between the study of thinking and the study of language processing?

The most serious argument I have found in this respect is this: 'Ericsson and Simon (1980) have revived the method of *réflexion parlée* in the study of problem solving. The method does have its uses, for we do monitor some of the *results* of our ratiocinations, and we use these results to make deliberate choices of future strategies. Furthermore, we can be forced to articulate hypotheses about things we would ordinarily leave to inarticulate reasoning. But the method works best in problem solving; it hardly works at all as a method for exploring how language is produced.' (Deese 1984, o. 12, note 9).

Whether this is true or not may be decided in course of time by the readers of this article and of the bibliography concerning other researchers using introspective data in psycholinguistic research.

Facing this situation I shall attempt to

1. exemplify and discern the function of protocols on verbalization (PVb) in the analysis of language processing,
2. draw a preliminary implicit outline of a model of language processing

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with a focus on units of processing, spread of activation and reconstruction of information in the case of translation.

This article is based on the following assumptions:

1. The human information processing system is a unified one. There are no fundamental differences between various types of processing.
2. The capacity of the human information processing system is limited. Information is stored in such a way that some of it in the focus of attention is immediately accessible for processing - and as such reportable - whereas some of it must be currently activated and reorganized in order to be accessible and reportable. It is especially this second type of information processing - the activation and reorganization of information - that is likely to be disclosed by PVb.
3. Human information retrieval is partly declarative and as such accessible for verbalization, and partly proceduralized and therefore not accessible for verbalization.
4. PVb for this reason are incomplete.
5. PVb, nevertheless, as Ericsson and Simon have argued, do provide valid and useful data on language processing.

I shall argue that nevertheless there are differences between verbal reports described in Cognitive Science literature and verbal reports used in the analysis of language processing.

1. In cognitive literature protocols serve to identify mental processes occurring during the solution of a cognitive task whose inherent structure and rules are completely known, as in a game of chess, logic problems, the Tower of Hanoi problem, the Missionaries and Cannibals problem, the Eight Puzzle, Duncker's Attack-Dispersion problem, etc.¹ PVb disclose the movements and sequences of movements, i.e. the decision tree in the subject's strategic plan to solve the problem according to its structure and rules.
2. PVb in language processing research, on the other hand, are documents of processing whose inherent structure and rules are neither known to the processor nor to the researcher.² They are an instrument to shed light on the verbalization process itself so that it may be recognized as such and explained. Indications of the processing aspect of PVb, the competition of plans, the units and levels of processing, etc. are especially found, as we have attempted to suggest for some time, in the temporal variables and speech errors in the language output.

Discussion of Data

Sample 1

The experiment reported by Glick and Holyoak (1980) aimed at the exploration and description of analogical problem solving from one domain (a fortress being attacked and captured by an army) to a semantically distant but structurally analogical domain (a tumor being attacked and destroyed by high-intensity rays without destroying the healthy tissue surrounding it).

Duncker's Radiation Problem

Attack-Dispersion story

A fortress was located in the center of the country.
 Many roads radiated out from the fortress.
 A general wanted to capture the fortress with his army.
 The general wanted to prevent mines on the roads from destroying his army and neighboring villages.
 As a result the entire army could not attack the fortress along one road.
 However, the entire army was needed to capture the fortress.
 So an attack by one small group would not succeed.
 The general therefore divided his army into several small groups.
 He positioned the small groups at the heads of different roads.
 The small groups simultaneously converged on the fortress
 In this way the army captured the fortress.

Radiation problem

A tumor was located in the interior of a patient's body.
 A doctor wanted to destroy the tumor with rays.
 The doctor wanted to prevent the rays from destroying healthy tissue.
 As a result the high-intensity rays could not be applied to the tumor along one path.
 However, high-intensity rays were needed to destroy the tumor.
 So applying one low-intensity ray would not succeed.⁴
The doctor therefore divided the rays into several low-intensity rays.
He positioned the low-intensity rays at multiple locations around the patient's body.
The low-intensity rays simultaneously converged on the tumor. In this way the rays destroyed the tumor.

(Glick and Holyoak 1984, 306-355)

PVb in this experiment were used to discover the mental processes leading subjects to the discovery of the solution and its transfer from the first to the second story as expressed in the final two paragraphs of the radiation text. The result Glick and Holyoak achieved was that subjects if - and only if - they were given hints to use the military story to solve the medical target problem succeeded in doing so.

Protocol analysis for these investigators - as for other cognitive scientists - served to provide data for the assessment of the role of analogical reasoning in problem solving, that is, the analogical solution of a verbally presented abstract cognitive task (the medical problem) in terms of the verbally presented abstract solution of a structurally similar task (the military problem).

According to the design of the experiment, subjects were first provided with a story analogy, for instance, the Attack-Dispersion story, which implicitly described the problem and then asked to think aloud while they were trying to solve the target problem in the Radiation story.

Since both stories, taken from Duncker (1945),³ were constructed for the purpose of representing two analogical but semantically different versions of the attack-dispersion solution of the problem, the scoring of the thinking-aloud protocols could be easily based on the number of propositions relating to the solution, their combination and sequence, and any statements disclosing the discovery of mapping relations between the solution principle and the second story. The particular *language* in the protocols - the way *how* the discovery processes leading to the solution of this *non-linguistic* cognitive task were verbalized and what problems and deficiencies of *verbalization* occurred - was practically of no concern for the investigators.

To put it another way: Information about mental processes in analogical

problem solving as well as other cognitive activities has been gained mainly, if not exclusively, on *non-linguistic criteria*.

It is not language but thought that has been in the focus of protocol analysis so far.

Protocol for S15 (Attack-Dispersion Condition)

Subject reads radiation problem.

S: Alright I, what I most, what I'd probably do is send in the ray at sufficiently high intensity and then taking the risk that the tissues, the healthy tissues that would be destroyed, could be repaired later on. Trying to relate this to the other problem, I could say that you could give multiple treatments of low-intensity ray. But from this problem it seems that they won't have affect on the tumor so ... so I don't think that would work.

Later ...

E: Okay. And as a last question can you give me a, tell me ways in which your solution would satisfy the constraints of the experiment?

S: What are the constraints of the experiment?

E: Okay, i.e., that the healthy tissue will not be destroyed, and the tumor will be?

S: Alright, in that way my first suggestion would probably not by the way to go at it. Because that way you're getting low intensity so it won't destroy the tissue and hopefully over a period of time the additive effect of low-intensity rays would kill the tumor. But from reading the article, I don't know if that would work or not, because it says that a low-intensity ray doesn't have any effect on the tumor at all. So I don't know. I don't know any other possible way of doing it.

E: Would it help to possibly go back to the story and see whether you can apply that?

S: Well, that's what I was trying to do here. It says here he divides his army into different small groups. Okay, may ... possibly. What they could do, but this is a whole new solution now, possibly what they could do is attack the tumor from a multiple of directions with lower intensity rays and then, since you're coming in from all different directions, the healthy, with small-intensity rays you're not going to be destroying the healthy tissue but you're, and they'll all converge at the point of the tumor which will hopefully destroy the tumor.

(Glick and Holyoak 1984, 306-355)

Actually this protocol as the others Glick and Holyoak present, in spite of occasionally documenting speech errors such as false starts (*'what I most*), self corrections (*'the tissue - the healthy tissue*), and repetitions (*'so... so I don't think...'*) not only does not sound like natural speech, which is deficient and hesitant all over, but resembles a type of edited text from which almost all features characteristic of competitive verbal planning, as made obvious in the PVb published in Færch, Kasper et al., in press 1987. for whatever reason are excluded.

In the cognitive literature on PVb the verbalization processes as such are of little interest. PVb are usually taken as documents of mental problem solving in a problem space, i.e. revealing means-ends analyses and the breaking down of problems in sequences of subproblems, etc. *What is* being verbalized counts, not so much *how* this is done.

If it is true that the human information processing system is a unified one, that mental processes underlying non-linguistic problem solving tasks, such as the transfer of a solution in one area or the solution of a structurally similar problem in a different area, and mental processes underlying linguistic tasks, such as the translation of a text from one language to another, are principally the same. PVb should shed light on the underlying

processes in the solution of verbal tasks as well. This is what this article is about. Whether a psycholinguistic analysis of PVb in the solution of non-linguistic tasks might add considerably to the quality and reliability of protocol analysis in general is a different question. I am convinced that it would.

Sample 2

The second sample to be discussed presents three brief excerpts from a long transcription of a thinking aloud protocol recorded during the solution of a translation task of an expository text from the subject's L2 English into her L1 German. It is taken from a thesis of one of my graduate students. This thesis deals with the decomposition of the translation process with the method of thinking aloud protocols (Decher and Sandrock 1984).

The sample fully reprinted in the Appendix is a much simplified modification of the original transcript used in the thesis as it neither represents the levels of translation in the original - one of the dimensions of decomposition - nor the exact temporal measures of the verbalization and writing passages of the TAP. What it does represent

1. in the First Excerpt is an almost totally proceduralized translation process with no introspective information whatsoever;
2. in the Second Excerpt is a minor syntactic search process on a sub-plan level (cf. Hölscher and Möhle, in Færch & Kasper eds., in press 1987), which is only minimally revealed by introspective information;
3. in the Third Excerpt is the course of a comparatively long and complex lexical search process, the various attempts to initiate relevant sub-processes, i.e. to activate new knowledge sources and reorganize the accessible information in various sequences and units of translation.

The First excerpt

Reading of L2 source text passage:

Moreover, some people speak a dialect

Protocol:

Außerdem sprechen (0.90) einige Leute einen Dialekt (...) ⁵

This first sentence in the sample is preceded in the original text by a number of statements in which the difference between standard written language and dialect oral speech in England is discussed. With the exception of the words '*people*' and '*speak*', all other lexems do not occur in the passage preceding this excerpt.

After reading the source text sentence the oral German translation is immediately initiated. There are no indications of processing problems. The simple syntactic structure of the sentence, almost identical in both languages, and its shortness quite obviously facilitate the direct translation. There is no hesitation between the oral translation of the sentence and the following writing it down which might signal a control or monitoring process after the translation. The three steps of the translation: the reading and comprehending of the source text as a whole, without decomposing it, the translation of it as a whole, and its final being written down as a whole follow each other immediately. Only the second part of the second step is interrupted by a pause which seems to serve the processing of the final portion of the sentence. No introspective information whatsoever gives us

insight in the underlying processes. This first excerpt is an almost perfect example of proceduralized text processing which is hidden from introspective observation. The decoding of the meaning of the sentence and the finding of the translation equivalent is not only facilitated by its shortness and syntactic similarity, but additionally by the inherent etymological and phonological similarity of 'speak-sprechen' and 'dialect-Dialekt' which, in terms of a representation model of language processing, certainly have an island-function.⁶ Such analogical processing reduces the task's load considerably and contributes to an almost totally proceduralized whole translation which is indicated by a complete lack of concurrent verbalization. Or to put it another way, when no conscious attention must be paid to the translation process, no insight in the underlying mental processes is provided.

The Second Excerpt

Reading of L2 source text passage:

Today regional accents *can* be heard in all the big towns and cities of England (0.57)

Protocol:

heutzutage können (...) können (0.16) äh nee
 nowadays can (p1) can (P1) uhm no
 heutzutage kann man
 nowadays can one

This second excerpt from the protocol, different from the first excerpt discussed before, exemplifies a decomposition process after the reading of the whole source text sentence. A step by step translation of comparatively small units follows. We shall only deal with the first of these units: Nowadays can (in its Plural function with reference to the L2 sentence subject accents vs in its Singular form with reference to the L1 target language transformation of the L2 passive construction into the L1 active construction and the corresponding shift of the subject to the Singular 'one').

The subject sets out with a translation of the equivalent Plural '*können*' (can), following the adverb '*today*'. She is so convinced that this is a safe hypothesis that she begins writing right away. What is completely automatized is the finding of the translation equivalent for '*today*', for 'can', as well as the syntactic inversion processor with a postponement of the sentence subject 'regional accent'. The repetition of the Plural '*können*' after the first unit has been written down signifies a control or monitor mechanism. Whether it is activated as kind of an afterthought or in the process of searching for the following subject of the sentence, we do not know. In any case, the subject suddenly becomes aware that an additional mechanism must be activated, the transformation of the English passive construction into the more adequate German active construction with a change of subject, from 'accents' to 'one'. This transformation is easily effectuated after the very short silent pause, the filled pause '*äh*' and the introspective denial '*nee*' of the preceding hypothesis. There are no other introspective items of information which might give us more hints about this reorganization process.

What the protocol reveals, however, is the sequence of steps just discussed, and the final decision that takes place when the subject drops the L2 governed first plan and chooses the L1 governed active construction instead *nowadays can* one (hear) (...). Once again, the translation process

that occurs in this very brief passage is highly automatized, as is the case in the first excerpt. However, this time it proceeds less smoothly and takes some time and reorganization. The introspective decision marker *no* finally closes a competition of plans triggered by the source text and the target translation, which is finally decided upon in favor of the active L1 version. The protocol in connection with the false starts 'nowadays can ... can' clearly discloses the underlying mental activity of competitive planning finally leading to an acceptable translation, in spite of the fact that practically no introspective information about this competition is given by the verbalization found in the protocol.

The Third Excerpt

Reading of the L2 source text passage:

where there is less (0.30) movement (0.24) of the (0.12) local population

Protocol: cf. Appendix

The subject begins by rereading the subordinate clause '*where there is...*' which in the course of the translation of the immediately preceding main clause has been read once before. Syntactic units such as main clauses and subordinate clauses may be, but need not be the kind of unit to initiate a translation process. As the pauses in the second reading indicate, the repetition of the subordinate clause not only serves to perceive and comprehend the text, but also to scan it in order to identify the forthcoming translation problems. The pauses before and after the words '*movement*' and '*local population*' make us anticipate that these are the later candidates for search processes in the following translation process. Interestingly enough, it is not a syntactic problem but lexico-semantic problems we may expect.

The first translation problem '*movement*', immediately before identified, is reintroduced. An interrupted introspective comment 'one could that now uh', obviously a meta-procedural statement reflects the search process itself. It is interesting to note that the translation process after the scanning and recognition of the problem areas during the first reading is decomposed into the units that need particular attention and treatment.

The following statement *now I must find an equivalent German word for it, for - a translation equivalent of 'movement', of course - is the explicit mention of the goal of the search process that has been initiated.*

This search process begins with a second reintroduction of the problem expression '*movement*'. The expressions *that is something like, indeed, perhaps*, all evidently reveal hesitation and uncertainty, that is, search, just as the pauses do. The genitive suffix *s* in the German word for population and the following word for change disclose a compounding subprocess being developed, which, however, is not completely activated before the next run. The following long explanatory statement *that people move away and other people move in probably* is an attempt to correct the anticipated false compound 'population change' by connecting 'movement' with the notion 'to move' through which a clear distinction between the agent of the movement - the population - and the direction of the movement - from one place to the other - is sustained. Moreover, this line of thinking adds a good deal of realism to the extremely abstract kind of reasoning before. It also evokes elements of imagery. The concluding remark '*wahrscheinlich*' (pro-

bably) from a semantic point of view expresses prevailing uncertainty and doubt, as a closing marker (x 'x x - with falling intonation contour) it signals the end of the first run and the anticipation of a second attempt to follow.

The second run starts with a complete reintroduction of the original L2 clause, *'where there is less movement of the local population.'* It is then translated step by step, as the pauses clearly show. The compounding of *population* and *change* to *population change*, announced in the preceding run, is almost realized but finally given up again in favor of the prepositional construction *change of population*. This phrase of course is ambiguous as to the role of agent. It is connected with the - wrong - adjective *little* in place of the English comparative *'less* in the original, which is a reference to 'towns and cities' in the preceding main clause. But since the unit of translation is the subordinate clause, this referential problem is not even noticed.

The second translation which is found for 'less' is quite interesting - *'geringer'* (minor) may be either understood as the comparative of 'gering'. In this function it would solve the referential problem just mentioned. Or it may be understood as the inflected form of the positive 'gering' plus the suffix *-er* marking the masculine adjective preceding the masculine noun 'Wechsel' (change). Thus the form *'gering-er* is a sort of transitional approach to the correct form 'gering-er-er.' It seems to contribute to the subject's decision to stick to this translation even in cases where a different case marker - *'gering-en* - is necessary.

The false start *'pf'* in the same passage lacking any semantic relation to anything uttered before or after, is an indication of an alternative plan being processed and the high processing load which inhibits the clear development of this plan. Unfortunately no other hint is given what this plan may be like.

The passage we have just been discussing which began with the reintroduction of the L2 version of the whole clause and aimed at the complete translation of the whole clause - different from the decomposition approach initiated in the first run - ends up in a complete mess: none of the translation problems identified before is solved. The translation found for 'less' is incorrect. It is thus not surprising that the second run is suddenly broken off and a third run is initiated with the presentation of a new topic: the translation of the second problem expression *'local population'* which is reintroduced for the first time.

The following statement *let us write* signals the subject's dissatisfaction with the result of the preceding processing and her readiness to finish the search. Writing, to be sure, in the sequence of steps beginning with the first reading of the L2 version is the concluding step throughout the whole translation process.

The passage begins with the translation of *'local'*, but the unsolved translation problem 'movement' from the preceding runs is so active that at once the beginning of the clause is taken up and processed again *'wo... es einen ... geringen ... ah... Wechsel... hm'* (where there is a minor change). But once again the hesitations and the premature interruption, the unexpected introduction of an entirely new word for *'movement'*, *'Bewegung'*, which again is completely out of context, the use of fillers etc. announce another failure of the translation process. The following false start *Be* reintroducing the wrong term *'Bewegung'* (Movement) again, reinforces the decision to write down the translated text and therefore come to an end with the search. Consequently the version *minor change* is reactivated, an - after the parenthetical remark *what have I just said* which explicitly refers to the

suggested solutions, the second translation problem *'local population'* is reintroduced for the third time in its original L2 gestalt.

The last run takes up an earlier translation of *'local - 'dort ansässig'* (there residing), is interrupted before the whole nounphrase is translated, since the metaprocedural remark *perhaps later on something better will strike me* again reflects a strong dissatisfaction with the equivalent suggested for *'local'*. Nevertheless the same word is repeated, connected with the L1 equivalent for population and then inserted into the final translation of the whole clause at the end *where there is a minor change of the there re ... siding population, indeed*. There are, however, two distinct signals that this final version of the translation process is not fully agreed with, the breaking apart of *re ... siding* and the addition of *'half'*, which expresses doubt and dissatisfaction as an ironic English *indeed* would do.

To conclude, language processing in general, and second-language processing in particular, in so far as it is not proceduralized is not a smooth linear sequence of events regulated by a rule but rather a multidirectional top-down/bottom-up reconstructive search for meaning. What the preceding analysis of the thinking-aloud data has shown, I hope, is that translating a text from one language into another is more than mapping words and collocational strings of words - the translational equivalents - and inserting them in an appropriate syntactic frame, but is rather activating and reorganizing a common underlying knowledge base.

It is the ambiguous nature of the given passage, of course, which in a very obvious way has initiated this complicated and unsuccessful search, as the meaning of the clause

'where there is less movement of the local population'

by no means is perfectly clear. Does it mean that the local population in the country does not move as much as people in the towns and cities of England do, in the sense that they stay at home much more over the week-ends, during their vacations, if they have any? Or does it mean that they do not move house or change from one place to the other as it where, change their place of residence as much as it is the case in towns and cities? That they show less mobility, and consequently, metaphorically speaking, flexibility, physically and intellectually? Or was the author of this text not careful enough and should he have chosen the word mobility or flexibility instead?

The search for the equivalent German expression for *'movement of the local population'* in the clause

'where there is less movement of the local population'

makes evident that second language processing is a struggle for meaning through a steady spread of activation and reorganization of the respective L1 and L2 knowledge sources.

Conclusion

Translation is not simply mapping translation equivalents stored in two corresponding lexical drawers, but activating and reorganizing equivalent areas of a common cognitive data base. If this activation is proceduralized, as shown in the first excerpt, 'trans-lating' two areas does not cause overt conscious search, i.e. hesitation, interruption, decision making, etc.; it works smoothly. If it is not proceduralized, as in the third excerpt, finding translation equivalents in the common data base is a declarative activity that takes effort and time. Pvb in connection with a careful study of temporal variables and

speech errors, as we have attempted to demonstrate, may open up our view into the inner workings of speech production. The mind, after all, is much less clouded than some people for a long time have been inclined to think.

In the discussion of their model of human information processing to aid them in explaining the scope and function of thinking-aloud data, Ericsson and Simon take the traditional view that information is stored in different memories which are characterized by different access and different capacity. Short Term Memory (STM) has a limited capacity and accessibility and Long Term Memory (LTM) a large capacity and permanent accessibility. According to this memory model only information held and processed in STM is open to verbalization, information in LTM must be transposed into STM in order to be reported.

In their article 'The Metaphorical Structure of the Human Conceptual System' (1981) George Lakoff and Mark Johnson have made us aware that in principle we cannot understand the world without the use of metaphorical concepts and that, consequently, Cognitive Science to a large extent depends on the use of metaphors to describe and explain cognition. One of the basic metaphors frequently used in Cognitive Science is the so-called conduit metaphor (Reddy 1979, 284-324) which models the mind as a container.

The memory model mentioned before rests heavily on the conduit metaphor as it insists that information must be taken out of one store and transferred to another store in order to be processed and reported. If one agrees with Lakoff and Johnson that 'Cognitive Science needs to be aware of its metaphors' and needs 'to be open to alternative metaphors - even if they are inconsistent with the current favorites' (p. 206) those metaphors which help achieve a deeper and more inclusive understanding of experiential phenomena must be favored.

The notion of spreading activity and of memory organization packaging discussed by Schneider and Shiffrin 1977, Shiffrin and Schneider 1977, John Anderson 1983 and Roger Schank 1982 seem to enable us to better understand the processing of language in lexical search as revealed through concurrent thinking-aloud data. The expansion and analysis of the PVb data I have attempted to present were implicitly based on these metaphors.

Notes

¹ cf. Simon 1979, pp. 230-44, 246-49, 344, 447-50, 499 and Anderson 1983, pp. 157-62.

² There is no linguistic theory that may claim to describe the processes that are actually taking place when language is processed.

³ Duncker kept a record of what his subjects said as they attempted to solve this problem. When he compared tentative solutions in the protocols one with another, they fell into certain groups. (...) Duncker characterizes a typical subject as moving down a particular branch 'in a family tree of such solutions,' i.e. reformulating the problem into a subproblem, and so on until he can make no further progress. At this point the subject is likely to try another branch of the tree in a similar fashion, until ultimately he either gives up the problem or comes up with a practical solution (e.g. directing a number of weak rays from different directions through the tumor). In solving such a problem, past experience is invoked by what Duncker calls the principle of 'resonance'. (Johnson-Laird and Wason 1977, 15-17)

⁴ The two concluding paragraphs in italics are the solution to the problem which had to be

found by the subjects in the experiment.

⁵ *cf.* Key to Symbols of Translation Protocol.

⁶ In a research (1983) we have transferred the "island" metaphor from computerized speech simulation to the discussion of natural language processing. It simply means that such processing depends on well established proceduralized units of speech, 'islands', in our case made accessible through an interaction of L1 and L2.

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Appendix

Key to symbols of translation protocol

<i>Today regional accents can</i>	Italicized segments of text which are discussed.
Reading L2	Reading of the L2 source text segments, introducing a unit of translation.
ein Wort finden für/	End of a unit of translation or introspective remark, preceding the following L2 reading.
ein Wort finden für/ a word find for	English word by word translation, disclosing search process as nearly as possible
Protocol	Thinking-aloud protocol (TAP) of the translation process.
(1.70)	Unfilled (silent) pause during verbalization process of TAP in sec. (cut-off point 100 msec.)
äh	Filled pause during verbalization process of TAP
(...)	Pause used to write down translated passage
Be, po	False start

Thinking-aloud-protocol

Context: *Moreover, some people speak a dialect. - Today regional accents can be heard in all the big towns and cities of England; dialects, on the other hand, are spoken mainly in the country, where there is less movement of the local population. But less and less people are speaking dialect now.*

First protocol excerpt

Reading L2: *moreover some people speak a dialect*

Protocol: *außerdem sprechen (0.90) einige Leute einen Dialekt (...)
besides speak some people a dialect*

Second protocol excerpt

Reading L2: *today regional accents can be heard in all the big towns and cities of England*

Protocol: *heutzutage können (...) können (016) äh nee heutzutage kann man
nowadays can (P1) can (P1) uhm no nowadays can one*

Third protocol excerpt

Reading L2: *where there is less (0.30) movement (0.24) of the (0.12) local population*

Protocol: *movement das könnte man jetzt äh (1.13) jetzt muss ich da mal ein adäquates
movement that could one now uhm now must I there an adequate*

Wort für finden für/
word for find for

movement das ist so (0.60) Bevölkerungs (0.34) ja Wechsel
movement that is something like population yes change

vielleicht (1.27) also dass (0.29) da (1.33) Leute (0.30) wegziehen
perhaps consequently that there people move away

und andere Leute hinzu (0.16) ziehen wahrscheinlich (0.73)/
and other people in move probably

Reading L2: where there is less movement of the local population

Protocol: wo es (0.68) wenig (0.423) pf (0.70) Bev (1.11) völkerungswechsel (1.58)
where (there) is little pfpop ulation change

äh (0.10) wo ein geringer (0.42) Bev (0.90) Wechsel der Bev (0.31)
uhm where a minor pop change of the pop
 der lo (0.30)/
the lo

Reading L2: local population

Protocol: (0.59) der dort (0.24) schreiben wir der dort ansässigen (0.42)
of the there let us write of the there residing

wo (...) es einen (...) geringen (...) äh (0.10) Wechsel (0.28)
where (there is) a minor uhm change

hum (0.54) Bewegung (0.78) hä Be (0.62) schreiben wir Wechsel geringen
uhm movement uhm mo let us write change minor

Wechsel der (...) was hab ich jetzt gesagt/
change of the what have I just said

Reading L2: local population

Protocol: der (0.57) dort (...) dort ansässigen (...) sässigen vielleicht fällt
of the there there residing siding perhaps strikes

mir da später noch was besseres für ein (0.40) der dort
me there later still something better for it of the there
ansässli ansässigen (0.13) Bevölkerung (...) wo es einen geringen
resil residing population where there is a minor
Wechsel der dort an (0.17) sässigen Bevölkerung halt gibbt/
change of the there re siding population indeed

READING PERIODIC BILLS

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Introduction

The study of reading and writing is a time-honored endeavor with a rich range of views about their relationship, the factors affecting their acquisition and use, and the very meaning of reading and writing literacy. Sometimes we speak of our ability to use written language consciously, that is, a sensitivity to the potentialities of language. We think in this way when we speak with exultation about a piece of fine writing as "one of the genuinely *literate* works of our time". We also speak of people as literate when they possess the reading and writing skills necessary to function at an eighth-grade level in school. In this latter sense, we intend reading and writing to refer to basic encoding and decoding skills needed to interpret texts with a certain sort of sentence structure as well as to write brief, expository texts. In recent years, both in the U.S. and abroad, we have turned attention to the reading and writing skills necessary to accomplish the daily tasks of modern society, i.e., *functional literacy*. This includes reading such materials as job applications, tax forms, and utility bills.

Functional literacy has captured our attention in part, because there is growing evidence that large numbers of Americans are functionally illiterate (Kozol 1985). At the same time, many have argued that the unintelligibility of the materials of functional literacy has contributed significantly to the problems readers have. Such sentiment has resulted in efforts by researchers and practitioners to improve the writing of such materials.

The practical or functional written materials to which considerable attention has been paid include two types: texts used for reference which do not require writing such as instruction manuals and product warranties (Duffy 1980, Felker & Rose 1981, Kern, Sticht, Welty and Hauke 1977) and texts involving reading and writing, i.e., forms (Felker 1980, Wright 1980, 1981a, 1984). Both strands of research share a focus on texts with which readers often have limited familiarity. This lack of familiarity stems from two sources: limited exposure to the materials in question and the purpose for which the materials are consulted. In the former instance, the materials are encountered infrequently or once only as in the case of an application for social service benefits or for a passport. In the latter case, the reader may need only to locate particular information and may do so infrequently. Here one would find instruction manuals for home appliances, a personnel practices guide or a product warranty. Much less is known about how readers interact with writing that is familiar to them and which is used for practical purposes. Here we would include monthly bills, bank statements or other routine documents. The purpose of this review is to lay the foundation for an understanding of reading familiar, routine bills with some recom-

mendations as to the direction applied psycholinguistic work might take.

This review includes a synthesis of literature from several sources: theoretical approaches to prose comprehension; applied studies that compare the effectiveness of various redesigns of documents; and applied research that examines the contexts of reading. Unfortunately a good deal of what is known about how people understand written information is taken from studies on the comprehension of narratives; much less is known about expository prose (Kieras 1985). Even with a body of knowledge about expository prose, its applicability to document design is not clear. Theory-based research on understanding prose makes no claims about applicability to practical issues in document redesign (Olson 1985). Indeed because the genres investigated under the rubric of prose comprehension differ in many, important ways from those in applied arenas, it is difficult to consider what the implications from one are for the other. Wright (1984, 552-553) observes:

[There are] many theoretical developments relating to the comprehension of written information... Researchers may hope that such understanding will provide a basis for solving practical problems ... However, it is easy to demonstrate that neither in the field of learning nor of reading does this appear to have been an easy gap to span..."

"As the subject matter departs from narrative prose to less conventional text such as forms, where graphic presentation factors are more dominant and where the readers' attention may be far from a linear progression down the page, then even best-guessers may be whistling in the dark."

There are similar problems in taking the outcomes of applied research as input to theory. The aim of applications research frequently is to solve particular problems; the implications of those problems for an existing theoretical model is unlikely to be a consideration during the design process. Hence, the collective knowledge which accrues from the study of practical problems cannot automatically be considered relevant to basic research. Indeed, what we know about how people read from practical experience may outstrip theoretical endeavors. Another aspect of applied activities also limits their applicability to theory. The conditions under which applied research is often conducted may be objectionable to laboratory researchers. For example, Duffy, Curran and Sass (1983) note that the simultaneous redesign of several variables is not unusual in applied research. Since applied research is often conducted within the narrow time frame of business settings, it is unlikely that its context will change. Hence, theoreticians may always object to the generalizability of applied research to theory-building. With these reservations in mind, let us turn to a consideration of what is known about how people read documents that they receive routinely and therefore are familiar to them and which have as an immediate goal the payment of charges due.

The written materials I focus on here are a type we receive routinely and yet one to which almost no direct attention has been paid in either the theoretical or applied literatures. These are periodic bills such as one receives at home ... utility, department store, and credit card bills. This genre plays an important part in the management of everyday life, recording our consumption and requesting payment. In fact, Rose (1981) placed bills and statements among a list of 54 crucial and frequently used public documents. A number of variables that affect significantly how we read such materials are examined in the following discussion. Since there is no body of research

dealing explicitly with periodic bills, this review has been constructed by integrating work that seems central to understanding this genre; this is done so as to lay a foundation for a future research program. Two major reader variables, purpose in reading and a reader's prior knowledge are discussed first. Then I consider text characteristics that seem most central to interpreting bills and statements.

Purpose

The purpose for which we read bills differs from our purpose in reading other types of printed matter. Whereas we may read stories for entertainment, textbooks to learn subject matter, and the newspaper for general information and/or entertainment, the major reason for consulting a bill is so that payment can be made.

Why we read a particular text has been shown to greatly affect what people read, how they read it, and what they recall. When we think about why a person is reading a text we are making the same sorts of considerations writers make when thinking about the needs of their audience. Wright (1978) has termed the former *reading goals*; the latter is commonly known to writers as *audience analysis*. Consider first how purpose has an impact on *what* people read. If a reader does not need information in some part of a text, it is quite likely it does not get read. Keller-Cohen (1987) observed that credit union customers tend not to read banking information if they can accomplish a task without doing so. She found this to be so even when the reader had no prior knowledge of the information. In related work, Wright (1981b) explored whether adults were likely to read instructions for a range of products and found that at least one-third would not read that information for all the products she surveyed.

These findings should not be surprising if we reflect on our own experience. How often has each of us thrown out information without ever reading it because we thought we'd never need to! The explanation for this practice rests in part on a more general understanding of the types of reading adults do. Sticht et al. (1977) draw the distinction between two types of reading tasks, where the goal is to acquire knowledge, *reading-to-learn*, and where the goal is look up information and use it, with recall not central to the activity, *reading-to-do*. (See also Duffy et al. 1983). In the former case readers may look for cues that will be helpful in storing the information and recalling it whereas in the latter, strategies for identifying and locating materials might be employed. So what and how we read is clearly the result of why we read.

What we *recall* is also a function of readers' purpose. If we don't need to remember what we read, the literature suggests that we do not. One might suppose that we do not recall information that we see infrequently or once only. But it's significant that highly repetitive material that is an integral part of daily activities may also be forgotten. In a provocative set of studies, Baddeley (1981) reported that people do not recall information they have seen/heard thousands of times. Bekerian and Baddeley (1980) studied this within the context of a saturation advertising campaign by the BBC which was trying to inform radio listeners of new radio wavelengths. They found that listeners who had heard the short announcements about the new system at least 1000 .times still did not understand how it worked. Only 9 of 50 subjects studied even attempted to guess the frequencies. "The overwhelming response...was 'don't know'." (p.263). Similarly, Morton

(1967) asked 151 subjects to reproduce the letter-number correspondences that appear on the face of a dial telephone and found that none could do this. Baddeley suggests that we do not need to retain such information because we have prompts available when we perform these sorts of tasks. Radio listeners can attach a label to the radio that indicates the location of the stations to which they listen; likewise, the dial of a phone can always be consulted for letters and numbers.

What would these findings predict about how people read routine bills? Since periodic bills or statements are quintessentially goal-oriented, one might expect customers to read those parts of bills that were central to determining the bills' accuracy and the amount to be paid. In a redesign of a midwestern telephone bill, Keller-Cohen and Mann (forthcoming) found that residential phone customers report they tend to read two parts of telephone bills: the amount due and the long distance calls. The amount due is the *sine qua non* of any bill, the portion that must be consulted in order to dispense with the bill. For many residential customers, the long distance charges are the only portion of the bill that varies from month to month because the monthly service charges for phone service are generally fixed for long periods of time. As such, residential customers would seem to view the long distance calls as crucial to determining whether the amount due is correct. Purpose then plays a central role in what and how users read bills.

Prior knowledge

In recent years there has been a good deal of attention to the role of prior knowledge in understanding texts (Bransford and Johnson 1973, Minsky 1975, Anderson, Reynolds, Schallert and Goetz 1977, Schanka and Abelson 1977, Rumelhart 1980, Abelson 1981, Olson 1985). The major thrust of this work has been that prior experience greatly affects how we understand written information. Readers bring to texts knowledge about how specific text types of texts are organized and the kinds of information they are likely to contain. For example Olson, Mack and Duffy (1981), were interested in readers' expectations about different types of texts. They asked subjects to read a narrative text and an expository text, commenting as they proceeded on what they anticipated would come next in the text. They found that predictions about the content of narratives differed from those regarding expository prose. This is undoubtedly because of the schemata readers develop for the interpretation of various text types.

These mental representations of familiar texts are helpful when readers approach new texts and wish to access their content. But these expectations seem to have a negative affect when documents are redesigned. Several investigators report that redesigned documents with improved accessibility in terms of organization, graphics and language resulted in no improvement in reader comprehension or even decreased performance. Duffy et al. (1983) evaluated the effectiveness of several redesigns of technical information describing a radio frequency amplifier used in the military. The redesigns were prepared by firms with long histories of success in designing technical information. Analyses of subject's responses on a paper-and-pencil comprehension task revealed that none of the redesigns resulted in improved comprehension and one in fact resulted in lower comprehensibility than the original. They suggest that readers' knowledge of the traditional design of such texts is negatively transferred and therefore inhibits their

ability to effectively utilize a redesigned document (see also Kieras 1985 for work on the role of textual schemata). Wright and Threlfall (1980) report similar results in the redesign of a journal index. Subjects made more errors with the new, improved format than with the conventional one. They suggest that real journal users who are more familiar with the conventional format may make even more errors with the redesigned version.

One possible explanation for why apparently better designs do not improve comprehension is that the user does not actually view the redesign as necessary. However, a recent study by Keller-Cohen and Mann (forthcoming) suggests that even a strong desire for redesign may not lead to improved comprehension. A midwestern telephone company redesigned its telephone bill in response to great customer dissatisfaction with the bill that followed the breakup of the telephone system in the United States. They compared telephone customers' comprehension of the existing phone bill with two redesigned versions. They too found no improvement in understanding.

Prior knowledge seems also to play a role in which types of redesigns customers will accept. Keller-Cohen and Mann found that customers disapproved of certain aspects of the redesigns which were not part of conventional bills. For example, at an early stage in the redesign process, the phone company they studied was unwilling to change the number of pages and general organization of the bill. They sought changes in typeface, graphic structuring and language only. To accommodate the unwieldy contents of the bill (which had grown to 10 or more pages for residential customers) a table of contents was designed and tested. Customers interviewed in focus groups categorically rejected this advance organizer because it did not "belong in the phone bill". Taken together these studies suggest that prior knowledge plays a complex role in text comprehension, aiding interpretation but often hindering readers' ability to accept or benefit from redesigned materials.

Organizers

Literature on text comprehension and document design recommends the use of devices that structure text and enable readers to access it. These include such devices as advance-organizers and headings (Bohr 1984, Carter 1985). Advance-organizers are devices that serve to introduce content. They might be linguistic (as in a summary or outline) or graphic (a diagram). Their purpose is to sketch the main components of the text that follows. Their effectiveness has been examined in instructional texts with continuing debate over the nature of their contribution (Mayer 1979). There is some evidence that advance-organizers enable readers to recall explanatory information but not non-explanatory information (Mayer 1985). Since bills typically contain explanatory information only when it relates to reporting errors in billing, this research suggests that advance-organizers would not be terribly useful in interpreting periodic bills. Moreover, in the preceding section on prior knowledge we saw that advance-organizers are not part of the schemata consumers have for bills; hence they rejected the use of as an outline as a preface to the telephone bill.

Whereas advance organizers seem to be of limited value to bills, headings appear to be very important particularly in long bills (e.g. the phone bill). Indeed, headings are widely supported as devices for making

texts accessible to users. They enable readers to locate information that is important to them when skimming a text (Hartley 1981, 18). They also provide an explicit structure which assists the reader in integrating the information as he reads (Dooling and Lachman 1971)" (Wright 1977, 906). That is, when a reader has a heading in mind, he is better able to evaluate how each piece of the text relates to other pieces in that sense, the heading suggests a framework into which the text can be fit. Headings may not always assist readers, however. Charrow and Redish (1980) examined the effect of headings in warranties. When warranties were written in plain English (in contrast to the legalese one often finds in warranties) the presence or absence of headings had no effect on reader comprehension (see also Swarts, Flower and Hayes 1980). Swarts et al. suggest two factors that may account for these findings. First, it may be that when texts are short as was the case in the warranty study, readers do not benefit from the presence of headings. So headings may be useful when texts are much longer and their structure and content is less apparent. Second, when prose is clear and easy to understand, readers may be able to generate their own frameworks for interpreting the text and consequently not need to rely on headings for that purpose. One would anticipate that longer, more complex bills such as business telephone bills (which can number in the hundreds of pages) would be more accessible to readers with headings but that readers interpreting simple, clearly written bills might not be affected by the presence of headings. Clearly, more work will need to be done to assess the interaction between text length and complexity and headings.

Language

A good deal has been written about the effect of language on readers' successes in interpreting texts (Wright 1977, Felker 1980, Felker, Pickering, Charrow, Holland and Redish 1981, Hartley 1981). Hence, a full review of that work would be repetitious. The discussion that follows suggests a few of the findings that are most relevant to a view of what readers are likely to find important in reading bills and statements.

One of the major obstacles to communication between institutions and their users is the professional or technical language of the institution. The literature is replete with reports of patients who failed to recover from illness or who became worse because they did not understand their physicians instruction; people who were injured because the warning label was unclear; and even unemployed professors who failed to receive unemployment compensation because they did not understand the application for benefits (Pattison 1982). The continued use of technical language is due, at least in part, to the fact that institutions lack the awareness that they use such language (Keller-Cohen, in press) or that their customers are affected by it. In a report of the redesign of a telephone bill, Keller-Cohen and Mann (forthcoming) report business customer attitudes toward the language of the telephone bill. They found that customers wanted the bill to use their language, to accommodate to them, instead of the current practice of using Bell-specific jargon.

The plethora of accounts that consumers do not understand many things they must read is paralleled by reports that changes in language improve comprehension. For example, there is considerable evidence that word choice affects readers' ability to understand written information. In a

reasoning task, Wason and Johnson-Laird (1972) compared performance when familiar words were used with that of low frequency, difficult words. They found that performance was enhanced by using familiar words (see also Paivio 1971, dark and Clark 1977). Similarly, Graesser, Hoffman and dark (1980) found that texts with more difficult words take longer to read. Keller-Cohen and Mann (Forthcoming) observed that telephone customers greatly preferred a redesign of the phone bill that contained everyday language over the customary technical register of the phone company. Hence, one would anticipate that consumers will benefit from reductions in the use of technical language in bills.

Sentence structure is also an important factor in the ease with which readers' access a text. Active sentences tend to be easier to process than passive sentences (Gough 1965, 1966); affirmatives are preferred over negatives (Clark and Clark 1977), as are shorter over longer sentences (see summary in Felker et al. 1981). Not surprisingly, these findings have often been implemented in document redesigns and writers' manuals. However, since bills primarily contain phrases and single clause sentences, there ought to be little need for concern about the syntax of this genre. Yet even periodic bills do contain more complex language. All businesses that make available revolving credit agreements are required by law to include information regarding customer rights and responsibilities (The Truth-in-Lending Disclosure). Little attention has been paid to this aspect of bills although one would predict that consumers would have difficulty reading this information when it contains unfamiliar terms and difficult sentence structure. A casual review of some frequently received bills uncovers the following sorts of sentences: (From Mastercard) "The Bank then calculates the 'Other Balances Subject to Finance Charge' Average Daily Balance by taking the beginning balance of your Account each day for the current Billing Cycle, and adds any new Cash Advances and XTRALINE Checks as of transaction date (not to exceed 45 days from posting date)," and "The 'New Balance' on your monthly billing statement is the total of the Previous Balance together with New Purchases, Cash Advances (which include Credit Card Checks), XTRALINE Checks, accrued Finance Charge and other fees and charges, less payments and credits, posted to your Account during a Billing Cycle." Thus, while the body of a bill consists of simple syntax, the advice and warnings about credit activities are likely to appear in complex, hard to understand sentences. On these portions of bills we would predict that user comprehension would be poor due to the syntax. Moreover, since these credit terms, rights and responsibilities are likely to be consulted only when problems arise (see Purpose section above), consumers may seldom read this information. Just how purpose and language interact in comprehending bills is an area that needs to be further explored.

Bills and periodic statements might seem to be unimportant domains of consumer reading to consider in psycholinguistic study. Yet, as this review suggests, they pose interesting and important problems worthy of study and clearly of significance in the management of our daily lives. As suggested in the preceding discussion, this research ought to take several directions. For example, we will need to obtain a fuller picture of the on-line reading of routine bills, and this can be obtained through observation and interview. That information could then be extended by conducting protocol analyses of users reading bills.. Those analyses would provide important information about the types of schemata we bring to the task of reading periodic bills. In addition, they would provide clues to the goals motivating particular reading

strategies and the devices (both linguistic and graphic) readers employ in interpreting this genre. A consideration of these matters will enable this genre to assure its rightful role in the larger field of document design and applied psycholinguistics.

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