PENTTI HAKKARAINEN, AILI HELENIUS JA PAVEL RAZINOW (eds.)

LANGUAGE LEARNING AND COMMUNICATION

ELEKTRONISIA JULKAISUJA 1998
ELECTRONIC PUBLICATIONS 1998
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KAJAANIN OPETTAJANKOULUTUSLAITOS, KAJAANI
1998
PREFACE

This virtual publication is a result of cooperative research by scientists affiliated with the project "Children and Language in Multicultural Europe", supported by the EU social fund via the Interreg II Karelia Programme. The project is of a multidisciplinary nature. Participants come from different areas of educational research (educational psychology, psychology of language development, psycholinguistics, developmental psychology and early education).

This project provides an opportunity to unite the efforts of specialists from two cross-border territories in a collaborative research effort into the problems of communicative development in early childhood. The University of Oulu has had thirty years of experience in researching children's language development, in phonetics, linguistics and logopedics. The Department of Teacher Education in Kajaani concentrates mostly on the notion of preverbal communication as a prerequisite for speech in the first months of life from the point of view of pedagogics and psychology.

Thus the project creates proper conditions not only for cultural dialogue. It provides an opportunity of enrichment for the participants involved. Pre-school and schoolteachers who take part in the project are able to learn the values of another pedagogical culture and, through them as if through a mirror, to gain insight into their own values and those of their own pedagogical culture.

At the outset of investigation the researchers (Razinow, Weigl and Helenius 1996) understood the necessity to study the questions of language acquisition in terms of the communicative development of infants as well as the interest shown by infants in concrete objects. The theoretical approach involved is of a holistic nature. It is also interdisciplinary and complex, both as a piece of research and in terms of its practical application. It thus involves practical work in the various pre-school institutions participating in the project "Children and Language in Multicultural Europe" in the region of Kainuu and the Republic of Karelia.

The basic contents of this value oriented programme are:
1. Children's preverbal and verbal development during the early years
2. Dynamics of communicative development in various age groups
(from 0 to 14 years and in a range of differing contexts)
3. Reasons for individual deviations of speech and language development
4. Consequences of individual differences in communicative development
5. Typology of individual differences in verbal and language development
6. Dynamics of foreign/second language acquisition
7. Individual differences and types in foreign/second language acquisition
8. The role of conscious and unconscious learning processes in language acquisition
9. Developing internet applications for language learning
10. Development of research based tools for language learning for use by parents, pre-school and school teams.

The project’s research programme is closely connected with the following areas: pedagogics, developmental psychology, social psychology and the theory of communication, foreign language didactics and mother tongue didactics, psychology of mother tongue and foreign language learning, cognitive psychology and psycholinguistics.

We can discern two different approaches to language among these researchers: 1) a value oriented approach which aims at the understanding of the structure of language and communication, and 2) a discovery oriented approach which aims at revealing the connections between language and thinking. The second approach searches for the gaps within science itself - differentiating between what is known and what is not known, i.e. fields of science where one can set tasks and goals without always knowing how these may be attained. On the other hand, it is necessary to investigate new fields which have not previously been explored by scientists, indeed, not even envisaged.

Specialists in research methodology (e.g. Froumkin 1984, Robinson Kerlinger 1996, Reason & Rowan 1981) are the opinion that all participants should have common values because through a common value system the setting of goals is defined in terms of both theory and empirical research, i.e. the main directions, procedures and research methods, qualitative and quantitative analysis of data, and, most importantly, interpretation of results which finally leads to the establishment of new areas of knowledge. This provides us with the opportunity to apply the knowledge gained to everyday life. It also defines new prospects for further research over the longer term future. Papers included in this publication present different aspects of children’s communicative, verbal, language and cognitive development. All of these aspects were topics for discussion at a symposium held in Kajaani in December 1997. We thank all the
participants and authors for their support as well as the EU social fund via the Interreg II Karelia programme for making possible the publication of this work in two languages. Let the content speak for itself.

Sincere thanks due to all authors who have supported the Children and Language project through making their texts available. Thanks also go to Nick Bamber who translated the majority of the texts into English and to Jaana Määttä for collating all the articles in this publication.

Kajaanissa joulukuun 28. päivänä 1998

Pentti Hakkarainen, Aili Helenius, Pavel Razinow
SUMMARY


This publication deals with the development of communication, its various stages and influencing factors. Subjects addressed include cognitive processes of language acquisition (Irina Weigl), problems and tasks (Sanne Dijkstra), and pre-school and primary school age groups (Kristiina Kumpulainen and Mika Mutanen). Irina Zimnyaya and Tatyana Poutilowskaja puts forward a communicative approach to the examination of speech development. Nikolai Veresov looks at concept formation in terms of the formation of meaning in the individual. In her investigation into the preverbal stage Kaisa Tolonen examines the significance of mother and infant's shared attention as a prerequisite of learning how to speak. Poutilovskaja and Choukreeva explore readiness for school in relation to communicative tasks. Sigrun Weigl presents a German language article describing the acquisition of German in a Hungarian day-care centre where one kindergarten teacher spoke only German with the children. Finally, Merja Karjalainen sets out her findings on the way children both use language during play and play with language itself.

Containing both theoretical foundation and experimental examples, these articles serve as a starting point for the “Children and language in a multicultural Europe” project as well as providing a basis and impetus for further study.
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COGNITIVE PROCESSES IN THE ACQUISITION OF LANGUAGE

When born, the human being is a helpless, 'languageless' creature, dependent on the care of its mother, or other caring adults. Within a very short period of its life, a mere three years, the infant develops into a highly versatile and complex child that can understand, and in practical situations use, that is make himself understood, in his mother tongue. Not only does the child have a considerable vocabulary, but it can in its communication with its environment express itself in more or less complicated sentences. How is this miraculous feat of language acquisition achieved?

The purpose of my research is to attempt to gain an insight into the cognitive developmental and learning psychological preconditions which allow the child to acquire the rules of speech and a vocabulary.

The following problems were identified in the theoretical considerations that form the basis of my experimental investigation.

1. Developmental and learning psychological considerations. The acquisition of language has to be regarded within the developmental psychological context. That is, within the context of the dominant object orientated activities and specific forms of communication with adults typical for a child in the second year of life.

2. The construction of the language system. What is actually acquired in the development of a language? That is, first of all I have to ascertain how the language system is constructed by the child. And how the acquisition process fits in to the developmental psychological context of the dominant object orientated activities of the second year of life.

3. How do cognitive development and language development interact with one another in the larger perspective of the child's interaction with his/her environment.

4. How is child/adult communication and co-operation organised?

All four of these aspects are of course closely connected with one another. I would like here to briefly examine point three - the cognitive processes of language acquisition.
Largely these processes can be divided into two categories:
A: How is the path to the acquisition of language opened to the child?
B: The more fine grained mechanisms that specifically determine the acquisition of the rule systems of language and lexicon, that is vocabulary, such as the comprehension and speech strategies.

Both categories are largely based on the perceptual activities of the child and are dependent on knowledge stored in memory (semantic memory), which is necessary for the mastery of language.

A) How is the path to the acquisition of language opened to the child?

Access to language is opened to the child through the help of non-verbal means: objects, actions, situations and events which it connects to linguistic structures which are then registered, remembered and processed together. Different authors have, in different ways, given varying emphasis to the non-linguistic experiences of the child in the acquisition of language:

Jerome Bruner (1975) “Very generally one can assume that the child has to acquire a complex of transferable or generative abilities in order to master language, which are perceptual, motoric, representational, social and linguistic in nature, that when suitably co-ordinated, can produce linguistic expressions, which can be described using the grammatical rules of the linguist”. These activity and language orientated situations, which occur in interactions between the child and adult are what Brunner (1983a, 1983b) calls ‘Formats’.

Noam Chomsky (1967) was of the opinion that an understanding of the complexity of language perception went beyond the boarders of linguistics and belonged more to the field of psychology. This concerns information which is outside of the area defined by the specific rules of grammar concerning sounds and their associated meanings; that is non linguistic information. Lois Bloom (1991) writes: “the young child does not begin with language, and early ontogenetic categories are not linguistic..... The cognitive work that underlies acts of learning, using and interpreting linguistic units consists of forming representations. These representations are ‘interconnected mental spaces’, they are not hidden levels of linguistic representations, but language does not come without them,... Virtually all developmental accounts of children’s first words have noted the strong association between word and object, word and action, or word and event...Mental spaces’ set up in the part of the mind that has been traditionally called working memory or consciousness”.

M. Bierwisch (1979) describes three systems that determine language behaviour, the ‘Conceptual System’ which includes the perceptual, cognitive and motoric processing of environmental knowledge and experience, and the Speech and Communicative systems.

I have, in my experiments, used as non-verbal means, play-action sequences, that had a certain familiarity value for the children, that provoked emotions and pleasure and that could offer object relations and actional intentions, which according to Brunner possess a certain “semantics and syntax of action”. Each operation making up the action is accompanied by language through which the achievement of the ‘Mental Spaces’ (Bloom) or ‘ Formats’ (Bruner), is directed. Through the perception of actions, speech specific mental structures are formed that create the basis of language mastery and use. In my experiments I have used a model based on three interconnecting principles: the language system, practical activity and communicative - co-operative interaction, as depicted in Fig.1.

Language mastery does not consist of stockpiling words and sentences or in learning utterences by heart. Children extract from the language they hear a set of lexical units and rules which form the basis for creative use of language. Language acquisition is based on the creation, storage, application of vocabulary, morpho-syntactic, semantic and phonological rules of the mother tongue. These developments do not occur consciously in the child. A child is not taught the rules of grammar or other procedures. It comes to use them without being aware of them.

Mechanisms of language acquisition, like all learning in young children, are closely linked to age-specific practical activities having to do with objects. Perception, assimilation and storage of action sequences stimulate both cognitive development at the level of practical activity and also the process of language acquisition.

The infant acquires language in communicative co-operative interaction. Both linguistic and non-linguistic means of communication participate in this interaction process. Non-linguistic means include, in the 1st year of life visual contact, laughter, babble, motor activities; in the 2nd, practical actions with everyday objects or toys. This hold for the 3rd year too.

**Figure1.** Three interconnected principles that form the basis of the process of language acquisition in early infancy. (I. Weigl)
In the first phase of language acquisition the perception of action related language, or rather the understanding of speech is primary. An alternative model of language understanding has been published by K. Hirsh-Pasek and R. M. Golinkoff.

**Figure 2. The process of language comprehension. Hirsch-Pasek & Golinkoff (1991)**

Language comprehension is based on the knowledge that the subject already possesses and on his mental representations, that is on the already stored linguistic and non-linguistic structures. Lexical information, prosody and syntax are recognised and integrated into the social and environmental context.

Hirsh-Pasek and Golinkoff (1991) pose the question: “why does comprehension appear so early?... One potential response to this question will undoubtedly be grounded in some view of language comprehension. In comprehension children receive organised prosodic and syntactic packages. They need to recognise the input rather than to engage in the recall and assembly that is required to produce parallel constructions”. Registration is also regarded as the first stage in perceptual theory. Affolter (see Augustin 1983) talks of three stages in the perceptual function:
1. Registration: the reception of stimuli.
2. Recognition: a comparison with either the long or short term memory.
There is a certain hierarchy to these three steps. Stimuli must first be received before they can be compared. The first and second steps must have taken place before the child can reproduce that which he has perceived. “The whole process of the acquisition of language is concerned with the dynamic aspect of memory construction, that is the erection of structures and operations in long term memory on the basis of cognitive and communicative dealings with the environment” (Bierwisch 1977). So long as there is a lack of verbal or semantic memorised knowledge present, the child cannot react to purely verbal input. It is necessary to combine the spoken with familiar actions, objects, experiences and events in order for it to be understood. Thereby however, the preconditions for language comprehension or rather for the development of comprehension strategies, the identification of heard expressions and the allocation of these expressions to already existing representations in the appropriate speech structures, are in place. The processes of language acquisition are based on the perception of the two fold offer of language and action. According to Slobin (1973) comprehension strategies do not only form the basis of the understanding of language, but also engender the formation of the rules of speech production.

Included in the model of language acquisition for children, that we suggest here are the registration, storage, processing and actualisation of action and language. The input consists of simultaneous and corresponding action and language structures. This double stimulus is perceived, stored and processed by the child. The cognitive processes of language acquisition, as well as cognitive processes on the concrete-object level which interact with each other, take place in a “black box”. As a result of this processing there develops the strategies of language comprehension and production, and internal action programs that put the child in a position to act independently (Weigl 1981, 1986, 1982, 1987).
Figure 3. Diagram depicting the perception and processing of language and action structures for children aged 2. (Weigl)

In brief: during the first stage of language acquisition there are multiple perceptions of non verbal situations - contexts, experiences activities - and verbal structures. These registrations enable the construction of the knowledge structures in memory necessary for the comprehension and production of language.

B) The more fine grained mechanisms that specifically determine the acquisition of the rule systems of language and vocabulary such as comprehension and speech strategies

The acquisition of the rule system of language

Anyone who is proficient in a certain language does not have, in their memory, an enormously long list of words or word combinations, rather they are able to produce any number of sentences and understand sentences that they have never heard before. Language ability is an active productive skill, and not just an accumulation of words and sentences. Wilhelm von Humboldt (1836/1972) also recognised the productive nature of language. He wrote “Language must make infinite use of finite means”.

Every person who can talk, possesses a more or less extensive vocabulary
and a system of rules that determines the construction of these words into expressions belonging to a particular language.

The morpho-syntactic rules determine the construction of sentences the position and function of words according to genus, number, case and mode etc.

The semantic rules determine the meaning of linguistic units.

The phonological rules determine systematic pronunciation of the linguistic units as well as the accent, tonal emphasis, pauses, prosody and intonation.

The syntactical, semantic and phonological rules are all closely connected with one another, and in concrete language use inseparable. The acquisition of the syntactical, semantic and phonological rules proceeds in a lawful way and in stages for the child, for both language comprehension and language production.

The stages of syntactical rule acquisition start with the linguistic expressions that accompany actions produced by adults. Through these, and only in connection with concrete activities, does the child start to understand simple sentence structures and produce single word expressions. We agree with the view of L. Bloom (1973) that is opposed to the widely spread opinion that one word sentences are compressed sentences that press a syntactical construction into one word. Rather we hold that they emphasise a particular component or part of a situation or an action. Apart from objects and people, events can also be the subjects of such expressions: “all...all” could for example express the ‘no longer present’ status of milk that was once in a glass. The word ‘open’ can mean the opening of a door, toy or mouth etc.

Somewhere around the age of 18 months, there starts the stage of the two word sentence. The number of such two word sentences initially increases slowly, but then develop with increasing rapidity. For example the following quantitative values were obtained for the observations of two word sentences over a period of seven consecutive months: 14, 24, 54, 83, 350, 1400, 2500 (Braine, 1963). There was then, the rapid appearance of many new word combinations in a relatively short time. The two word sentences are not just the bringing together of two words, but rather can take on a large number of functions in the language of the child. For example the determination of a position (‘book there’), the expression of a wish (‘more milk’, ‘please apple’), a negation (‘coffee no’), the description of an event (‘dolly comes’, ‘knife cuts’), the
expression of possession ('my ball', 'mummy's hat'), a question ('where ball'), and so on.

Slobin (1974) demonstrated the most important function of two word sentences with examples from English, German, Russian, Finnish, Luo and Samoan. The similarity of the different functions of the two word sentences in all languages is clear. As soon as children start to produce expressions that are longer than two words a (incomplete) syntactical structure can be found. Mostly they are telegram style sentence structures. That is words that are necessary for the meaning of the sentence are kept (substantives, verbs and adjectives), and that which may be gathered from the general context is left out (pronouns, articles, subsidiary verbs etc.). For example “dolly goes sleep” ('the', 'wants' and 'to' are left out).

The construction of the semantic structure of words is completed in stepped differentiation in the setting of semantic areas, so called semantic fields (compare Clark, E. 1993, and Nelson, K. 1986, among others). The processes that determine the construction of the semantic rules are multi-layered and complex. They are closely connected with cognitive processes, that is; knowledge processes, especially the formation of concepts and the fixation of memory as well as the whole of the situational context, or rather with the activities of the child. Semantic differentiation is strongly supported by the activities of the child.

Initially, semantic characteristics are not clearly distinguishable from syntactical characteristics. In fact, during the period of single word sentences the words contain both syntactical and semantic characteristics. So the child can say the word “Doll”, which can represent the intention: “I want a doll” and at the same time have a semantic structure and a sentence meaning (See D. McNeil, 1974).

A last example, this time from our own study: A child uses the word ‘zu’ (meaning ‘closed’) for the acts of undressing, dressing and the fastening of buttons. This word thus expresses simultaneously a stage of syntactical and semantic generalisation. Semantically, all of the activities carried out whilst (un)dressing are included. Syntactically we are dealing with a generalisation of the prefix of the verb (all of the above mentioned verbs take this prefix in German).

Brown & Bellugi (1964) call the Substantives, verbs and such like 'content words' and the words that fulfil a more grammatical function (Pronouns, prepositions etc.) 'function words'.

1 Brown & Bellugi (1964) call the Substantives, verbs and such like 'content words' and the words that fulfil a more grammatical function (Pronouns, prepositions etc.) 'function words'.

1
The gradual acquisition of phonological rules does not start with the assignment of particular meanings to particular sounds, that is with the precise and differentiated understanding and production of sound structures. First of all the child grasps the speech melody or so-called prosodic aspect of linguistic expressions. The rise and fall in tone, the pauses between components of sentences, word emphasis and the demanding, asking and rejecting characteristics of expressions are directly accessible to, and emotionally effective on the child. This all builds the foundations for the understanding of language and for the child’s production of language. We found a considerable number of sound structures that expressed the melodies of a sentence, accents and pauses and such like, without being semantically identifiable.

At the same time though children are gathering new experiences, and they try to pronounce new and difficult sound structures. For example we recorded six variations of the pronunciation of the word ‘Strümpfe’ (sock) from one of the children in our study: ‘Hümpe - Tümpe - Tümple - Tümpfel - Tümpe - Stümpe - Strümpe’.

We would like once more to emphasise that during the stage of the incomplete acquisition of the rules of language, the practical activity and the concrete situation play a decisive role. It is only in connection with the concrete situation that, on the one hand, the child can understand the meaning of language, and on the other that the child’s own imperfectly expressed intentions can be understood by the adult or other children.

The cognitive processes of language comprehension and production

When comprehending or speaking a language, an adult completes a series of cognitive processes in an automated and concentrated form in fractions of a second. Without these cognitive processes the comprehension and production of a language is not possible. They touch upon the retrieval of stored characteristics, rules and structures that make the understanding and production of language possible. Further the whole network of concept formation also belongs to these cognitive processes, and are also included in the system of the particular language through the means of the particular meaning structures.

All of these processes are gradually developed by the child through his interactions with his environment. They require in the first place the construction of a memory store which carries out the analysis, identification and classification
of that which is heard or the internal drafts for the creation of expressions, with already existing internal representations. This all happens unconsciously.

The hearer extracts from the speech signal information that is analysed phonetically, syntactically and semantically, compared with existing stored structures, identified and understood. The comprehension strategy may be regarded as a process in which the acoustic speech signal, that is the heard sentence, is processed and the corresponding information is channelled (input) in to a mentally comprehended sentence structure (output).

![Diagram of comprehension strategy]

The speaker starts with a thought or concept which is converted into a suitable syntactic, semantic and phonological structure, which is then in turn realised in speech. The speech strategy can then also be understood as a process which takes as its input the internal representation of an intended communication, and has the acoustic signal, that is, the motor realisation of the sentences as its output.

![Diagram of speech strategy]

The strategies of comprehension and speaking are tightly intertwined with one another, correspond with one another in the sense of inner-speech encoding, and decoding of a communication.
**Figure 4. The processing path of speech and comprehension.** (Weigl)

Fig. 4 depicts the complicated processing involved in language comprehension and production. The processes that take place between the hearer and speaker take the form of a circular rule depending on the multiple feedback between the sender and the receiver. These strategies are developed in the communication between adult and child.

**Cognitive processes in the acquisition of language rules**

Single rules are not learnt from the mass of linguistic expressions in the acquisition of language, rather regularities are grasped, systematised and generalised from the gamut of language heard. Accordingly language development
can not depend on the mechanical remembering and practising of single expressions, but must aim at the grasping, remembering and using of the rule system of the native language. The child makes a large but limited number of linguistic experiences: it hears and understands sentences, is or is not understood, is corrected and connects linguistic expressions with other events. Experiences of this kind in connection with the object orientated activities of the child and the communication between the child and adult, provide the foundation for a language analysis and build a more or less perfect phonological, syntactical and semantic pallet, a part of which (the most important and most often repeated part) will be retained in long term memory. This pallet, that is the perceived linguistic surroundings, is compared, classified, selected and the unimportant parts sorted out in long term memory. Based on its experiences, the rules of the child’s native language begin to crystallise. The grammatical structure is unconsciously reflected by the child as a system of rules, the construction of which stretches over the entire pre-school period. The grasping of the rules follows along the principle of simplicity; that is the simplest most general rules are acquired and tried out first. Thus it is that one often observes incorrect generalisations, that is so called “over generalisations”.

Here are a number of examples of over generalisations from our study of crèche children: ‘Wir haben Apfeln gekauft (we bought some apples)’; ‘Ich habe auf dem Pferd gesitzt (I sitted on the horse)’; ‘Mutti hat getelefoniert (mummy has telephoneded)’; ‘Wir habe geschreibt (we have writtened)’ etc.

These examples demonstrate that certain rules are already present, but as a result of limited experience they are over generalised. That is for example the standard rule for the plural, as in cars, dogs, houses and hands is ‘incorrectly’ generalised and applied to the word sheep. When children say ‘goned’ ‘sitted’ and the such like this means the irregular verbs are being declined in to the past tense as if they were regular verbs. This tendency to over generalise in children has been reliably observed in all languages; children it seems are especially susceptible to regular forms in language. As soon as a child has recognised a regularity it tries to use it as often as possible. Similar phenomena have been observed in children’s use of Russian where the amount of inflection allows for far more over generalisation than is possible in either German or English (see. Slobin 1974).

Due to further new experiences, or rather an adequate provision of opportunities by the adult, the linguistic contents that have already been acquired will be compared and classified anew; the child will form extra rules, already exist-
ing rules will be revised. Should new differences between knowledge and experience arise, the grammar will be reappraised. At the same time the rules will be actively and spontaneously applied. It is impressive to see how the child strives to generalise, to form analogies, to search for regularities, in short to achieve an order in its language.

The perception, selection, classification, and generalisation of the heard linguistic material, all these cognitive processes clearly demonstrate that this stage of childhood language is by no means a mechanistic trial and error process. The acquisition of language is not 'accidental' but rather is compelled by the objective rule system on which the native language is based. The acquisition of linguistic rules is not voluntary and not conscious.

In conclusion, I would like to finish by echoing some of the thoughts expressed by S. Pinker in his book “The Language Instinct” (1994). “...fact is that children develop these complex grammars rapidly and without formal instruction and grow up to give consistent interpretations to novel sentence constructions that they have never before encountered.” (P.276) “The three year old, then, is a grammatical genius - master of most constructions, obeying rules far more often than flouting them, respecting language universals, erring in sensible, adult-like ways, and avoiding many types of errors all together. How do they do it?” (P.283) “What actually happens from moment to moment in children’s minds as sentences come in and they try to distil rules from them”.

Hopefully my work has made a small contribution to answering these questions.
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Hilsdale, Lawrence Erlbaum Associates.
Sanne Dijkstra

LANGUAGE DEVELOPMENT AND KNOWLEDGE ACQUISITION IN EDUCATION

This paper addresses the issue how language development and knowledge development can be supported and strengthened in education. First the general framework for language development is outlined and the role of parents and tutors to systematically introduce the child in the cultural world is emphasized. Then the speech production mechanism is outlined and it is shown how language impaired children of age five to six make errors. A detailed study of language errors was used to design instructional programs for the improvement of the child’s language in the early period of elementary education. Finally the instructional design rules for producing the content of the learning materials and of the remedial material for the language training are elaborated.

Language development and cognitive development: Introduction

The language development in the child’s first seven years is fully dependent on communication between the child and parents, peers and teachers. After children have learned to read many of them further develop their language by trying to acquire the meaning of new words and grammatical structures themselves, but nearly always the children need help of parents and teachers. Reading books and, as is possible today, web pages nevertheless is very important for language development. Later, mostly in secondary education when dictionaries, encyclopedias and electronic databases can be used children are able to learn the meaning of newly encountered words, also words from a foreign language. In these cases again the guidance of a teacher and sometimes a parent is still important. Thus the children try to construct a meaning of newly encountered words and for the acquisition of the situated and for the more general and abstract meaning they will be coached and guided by a parent, teacher or peer.

Language development is strongly related with knowledge development and in general cognitive development. Bruner (1966) emphasized that cognitive growth depends on the functioning of an internal information-processing and storage system. The system can function if a symbol system such as a language is available. That makes it possible to represent reality and to store labels of categories and relationships in memory and to carry out simple
operations. Language makes it possible to go beyond the immediate sensory impressions. Being a member of a family or a community will not automatically cause the development of language. What is necessary is a tutor who systematically interacts with the child. The tutor will introduce the child into the cultural world and serve as a model for using a word in a certain situation, for practicing the pronunciation, for practicing simple sentences, for providing meaning. First the parents will function as a tutor, later the teachers. Their task is to carefully listen to the child and then systematically enrich the language. If new words and meanings are practiced and more general representations are developed this also means the development of knowledge. The child’s participation in the cultural world is dependent upon the development of language for which systematic interaction with parents and teachers is necessary (Vygotsky, 1978). Listening to the child how they mediate the world in their stories reveals “errors” in their representation. The tutors will use this information for telling stories and use its content for teaching conceptions that are more general and more independent of the immediate stimuli. They thus try to extend and change the child’s representations of their immediate world. The enrichment of language thus includes both the acquisition of new meanings and the generalization of representations.

Knowledge comprises facts, concepts - both class- and relational -, hypotheses and theories and finally design rules all of which are based on the use of a language. Language as such is a symbol system the elements of which form an ordered set or alphabet that can be used by applying a number of rules. Knowledge develops from rudimentary to more articulated and defined forms. In early childhood knowledge is fragmentary and used for expressing needs and emotions and for indicating a situation from the immediate available stimuli. Using the labels Piaget has given to stages of cognitive development gradually in the intuitive phase of the pre-operational stage, that is approximately between age five and seven (Gruber & Voneche, 1977), children learn to “abstract” from the immediate sensory stimuli. They will become able to use a symbol system and learn to read, use numbers and make categories of objects, based on more than one feature of the objects. They also will develop more complex relationships in what is labeled the principle of conservation: objects and quantities remain the same regardless of shape and number of pieces in which the object is divided. In the concrete operational stage children are able to practice logical operations with concrete material and in the formal operational stage they become able to think logically with abstractions. Thus the development of knowledge in its abstract form is possible if the human being reaches the intuitive phase of the pre-operational stage of
development and is confronted with a tutor who will systematically interact with the child, create a learning environment for the child in which it is possible to develop knowledge and skills. That is a learning environment in which the child will be active, answers questions and problems and receives rich feedback. These ideas will be elaborated in section 3 of this paper.

Knowledge development and cognitive development in general are dependent on and go together with language development. For language development a purposeful communication with a tutor is a condition. Yet much can go wrong, both in conceptualizing and in speech production. In the next section we will discuss a research project on the design of intervention programs for language-impaired children that is carried out by Braam-Voeten (1997).

**Communication and language problems**

Children will communicate the meaning of words in a communication with adults, teachers or peers. The classic model of a sender, a receiver and a message applies here. First the human voice is the medium but soon pictures and text will pass on messages. The spoken words contain the information for the receiver based on which the conclusion is drawn whether the words and sentences are understood or not and whether there is a specific language problem. Either the child doesn’t understand the meaning of words or the speech production process shows errors. Usually the first problem can easily be solved by explaining the meaning of a word or by informing the child that much knowledge and skills are necessary to understand the word and that the acquisition of the knowledge will take a long time. Sometimes misunderstanding means mental retardation and further diagnosis is necessary. Sometimes the sentences the child produces are wrongly constructed and contain many errors though the receiver supposes the child understands the meaning of a word or a situation. In these cases the speech production system is unable to construct a grammatically correct sentence. Braam-Voeten studied the speech production of language impaired children and developed instructional programs for improving the speech skill.

For the production of speech Levelt’s model (1989) that is shown in Figure 1, was used. Speech production occurs in a communication process or discourse in which messages are constructed. The production mechanism encompasses three process components: the conceptualizer, the formulator and the articulator. The result of the elaboration of a message in a process component is the input for the next component.
Based on the speaker’s ideas the conceptualizer constructs a pre-verbal message that represents a meaning. In the next component, the formulator, the message is encoded grammatically and phonologically. The grammatical encoding means that for certain conceptual structures of the message a word that represents that structure has to be found in the mental lexicon. This representation is labeled a lemma, that contains the semantic and syntactic information. The category to which the word belongs and the order of the words in a part of a sentence, for example, constitute syntactic information. With normal development the grammatical encoding takes place automatically after which the phonological coding occurs. The lemma’s or headwords are changed into lexemes that contain the morphological, phonological and the metrical information. Together the retrieved lexemes constitute the sentence representation. In a number of steps first the morphological structure of the
headwords is realized. For example, in the sentence “he reads a book” the lemma “read” retrieves the lexeme that consists of two morphemes “read” and “s”. The retrieval starts the phoneme representation. The phonemes of a sentence constitute the phoneme representation of all the words and its syllables in that sentence. It is supposed that an articulatory pattern is connected to each syllable or word, which constitutes the formulator’s output. The entire output is labeled the phonetic plan. The articulator finally activates and regulates all the muscle movements that are necessary to start the overt speech.

Language problems can have many causes which are arranged in two categories: (a) lack of knowledge problems and (b) “process” problems. In the first situation the communication shows problems: the child may lack necessary conceptual knowledge because parents or adults didn’t practice it with the child. Or the knowledge may be too abstract for the developmental stage the child has reached. Language problems also may be caused by dysfunctioning of the speech production system. In these cases often communication is possible but the produced language yields errors. It is difficult to precisely diagnose in which part of the supposed speech production system the problems occur. For example in the formulator the grammatical encoding doesn’t take place because the lemma is missing or is syntactically incomplete or cannot be retrieved from memory. The errors include missing words and wrong order of words in the sentences produced. Other errors may occur if phonological encoding cannot be fully controlled or is even impossible. The lexeme may be missing or incomplete and phonological and morphological information cannot be connected to it.

Braam-Voeten studied the effect of instructional programs or language therapies to improve the spoken language of specifically language impaired children. She first had to differentiate between a group of language impaired children and children with a normal language development. If the language development is 12 months behind the normal language development of the chronological age the child is included in the category of language impaired children. The measurement of the language development at a certain chronological age is done by administering tests. Stark and Tallal (1981) developed the procedure. Other variables and the criterion scores defined on these variables lead to exclusion of the child as specifically language impaired. These variables are deafness, serious emotional and behavior problems, IQ lower than 85 on the Wechsler Intelligence Scale for Children, neurological problems and disturbances in the motor system. In her research project Braam-Voeten first diagnosed a group of children as specifically language impaired.
Then she collected language samples of spontaneous speech production that were recorded on tape for each child. The analysis of a spoken language sample will provide a clear description of the language problems. The tests only make a general categorization of language impairment possible, but cannot be used to detect the specific language problems. The samples yielded two main types of errors, subject-predicate or subject-verb agreement errors and the omission of words. It is supposed these errors are caused in the formulator. The errors may result from grammatical encoding, such as absence of a lemma or of information related to a lemma about its word class and its position in a sentence. The speech production problems also may be caused by wrong phonological encoding: absence or incompleteness of the lexical forms and its morphological and phonological information. A possible cause of errors may be a capacity problem during the construction of the sentence representation. For example the access to the mental lexicon may be too slow or the activation of the lemmas or headwords is slow. The sentence representation probably decays too rapidly. The result will be a disintegration of the sentence representation.

To study the results of the training of language impaired children by speech/language therapists Braam-Voeten developed two intervention or instructional programs. They also are labeled therapies. The goal of the first program (A) was to improve the subject-predicate agreement by correctly applying the agreement rules. The goal of the second program (B) was to practice the completion of the sentence. A mixed therapy was developed for the treatment of both symptoms. It was hypothesized that positive effects of the interventions will be found.

Fourteen children participated in an experiment. Seven were language impaired and seven had a normal language development. The children were matched on age, gender, intelligence, socio-economic status and Dutch language speaking abilities of the parents.

The subjects in the first group served as their own control. The experiment ranged over three periods of just over four months: the control, treatment, and retention periods (see Table 1). Of the experimental group two children participated in the subject-predicate agreement intervention, two in the capacity program and three in the combined program. The programs consisted of 60 sessions. Each session was standardized and consisted of four parts: a new problem for practicing, an exercise to lengthen utterances, a revision exercise and an exercise to use the learned issues in spontaneous speech. In
the control period no language treatment was provided, but instead the children were presented non-verbal activities. This procedure can show the result of the treatment by subtracting the scores in the first period from those in the second period. As a dependent variable "number of correct utterances out of 100 utterances" was used.

Table 1. Design of the experiment on the effect of intervention programs on the speech production of language impaired children (after Braam-Voeten, 1997)

<table>
<thead>
<tr>
<th></th>
<th>Specific Language Impaired</th>
<th>Language Normal</th>
</tr>
</thead>
<tbody>
<tr>
<td>First period (4 months)</td>
<td>Non-language activities by therapist</td>
<td>-</td>
</tr>
<tr>
<td>Second period (4 months)</td>
<td>Intervention programs by therapist</td>
<td>-</td>
</tr>
<tr>
<td>Third period (4 months)</td>
<td>Non intervention, no contact with therapist</td>
<td>-</td>
</tr>
</tbody>
</table>

The group of children who had normal language development was used to follow the maturation and development of this group. During the experiment a language sample was taken four times: at the start of the experiment, after the control period, after the treatment period and finally after the retention period. The results of the experiment showed the subject-verb agreement therapy did not lead to significant improvement of the agreement rules. Already in the control period all language-impaired children showed an unexpected improvement of subject-verb agreements. The result of the capacity treatment showed a significant decrease of omissions. The combined intervention showed the number of correctly applied agreements also increased during the control period. The fraction of omissions also decreased slightly as a result of the treatment. The results of the combined program are trends, the differences are not significant. In general the retention of the skills is satisfactory and the generalization to spontaneous speech is good.

Though the results have to be applied with caution it is suggested the capacity treatment of children with specific language impairment should start early. The result of the intervention on the subject-predicate agreement errors is more difficult to interpret. A more detailed analysis of the data showed that the pattern of high and low frequency verbs out of 50 subject-verb structures in language-impaired children resembles that of the children with normal language development at the end of the first period. Three categories of subject-verb structures were distinguished: high frequency irregular verbs, low frequency verbs that were correctly conjugated and low frequency verbs that
either were incorrectly inflected or omitted. Of the language-impaired children 60 % used only nine different high frequency irregular verbs, whereas 15 % and 25 % of subject-verb structures are found in the other two categories. The corresponding percentages of the children with a normal language development are 60 %, 22 % and 18 %. It was concluded that during the control period the learning process has started again. Because the use of irregular verbs is substantial the suggestion is made to start practice of these structures first. As Braam-Voeten concludes: "The learning process of the language-disordered children then has been more or less stagnated initially, because for an unknown reason the storage or the retrieval or irregular verb forms was not or only with difficulty established. This occurs supposedly with specific representations and processes in the formulator. At this moment incorrect or no strategies can have been applied with the perception, the memorization, the retention or the retrieval". The conclusion underlines the importance of memory in language development.

The problems and tasks for language development

For the development of language a tutor who can activate the child is necessary. Two issues then have to be addressed: (a) the content of the activities and (b) the communication technique to stimulate the child's activities. For the content the goals were taken from the main goal of education. This is that students acquire knowledge and learn and practice skills that they can use to reach their aims, prepare for a job and meet public requirements. The development of language is essential for realizing these goals. For the development or construction of knowledge and learning skills different instructional-design theories and models, that are related to human learning and problem-solving activities, have been developed. Recently Dijkstra (1997) and Dijkstra and Van Merriënboer (1997) developed an instructional-design theory that is based on human problem solving. Three categories of problems are distinguished, categorization or description problems, interpretation problems and design problems.
The solution of the problems results in different cognitive constructs or schemata. The problem-solving procedures (algorithms, methods) appear as different tasks to be done. For example, the cognitive constructs resulting from the solution of a categorization problem are concepts (both class and relational) and conceptual networks. The task to be done is identifying the relevant features and their logical connectives and classify the objects into a category. For example the concepts of tree and animal are examples of class concepts, whereas the concept of family is an example of a relational concept. The task is known as the application of an identification algorithm. What features have to be found to categorize a tree as a pine? The use of both relevant and irrelevant features form the steps of the identification algorithm. The cognitive constructs resulting from interpretation problems are principles, laws, causal networks and explanatory theories. The tasks to be done are the problem-solving procedures for carrying out experiments, collect data, solve equations, and so on. For example the statement “gravity is directly proportional to the mass m of an object” is a principle.

For the solution of design problems, artefacts have to be created (for example a dress, a suitcase, a car, a course program). The cognitive constructs in these cases are plans, procedures and the tasks are to carry out all the operations, steps that are necessary to reach the final product. For the development of knowledge the learners should be involved in problem-solving activi-
ties such as exploration, imagination, discovery, application and design. Usually the students need guidance and help to develop the knowledge and learn the skills. That guidance is the instruction, that is realized as providing information and feedback and motivational support when necessary. The instructors can provide the guidance based on the students' questions and on the results of achievement tests that indicate which knowledge and skills are acquired. But the essential feature of instruction is that the students are asked questions and get problems presented. Then they will be active, can observe and manipulate objects, do experiments and predict future events and be able to create and design.

The required results of learning differ based on both the phase of cognitive development of the student and complexity of the level of application that is involved. Three levels of performance are distinguished for each of the three categories of problems: (a) remember, recognize and imagine; (b) apply, use and predict; and (c) construct, create and invent. At the lowest level of performance, both examples of the solution and the procedure to reach a solution are available for the learners. At the middle level of performance the students apply a procedure to solve a problem. At the highest level of performance, neither examples nor the procedure to reach a solution are available for the students and both the knowledge and the problem-solving procedures have to be developed. From these levels of performance it becomes clear that the problem-solving activities will differ considerably.
Solving problems requires that the students are active. Activation can be realized by asking questions, and by carrying out tasks. Based on the general goals of education the three categories of problems have to be presented and practiced during the whole period of education in a balanced way.

For the aforementioned study the interventions were based on a problem-based approach. A “problem situation” was presented to the children in which the three categories of problems were represented. The problem situation could be a picture on a card or in a booklet and a general question then is: What is shown here? The children are requested to categorize, for example a house, a cat, playing, drawing, running, and so on. They further have to interpret the situation and explain what occurred. They also had to design a correct sentence. Thus the children's problem is to tell what they see and think in a complete sentence with a correct subject-verb agreement. The knowledge and skills that will develop comprise (a) the conjugation rules for verbs; (b) person, number and time of the subject and finite form of the verb and (c) making complete sentences. Of the levels of performance both remembering

Figure 3. Three levels of performance for the three types of problems
and application are important. The tutor will emphasize learning by examples and especially learning by doing for which modeling and expansion techniques will be used. The problem situations will increase in complexity: categorize the object on the picture, tell what the person does, sentence completion with a simple sentence, change a sentence from the third person singular to first person singular, make a sentence if one word is given, after the tutor reads a story then tell the story. It is concluded that for the acquisition of language a gradual increase in complexity of problem situations is necessary.

Discussion and conclusion

In the introduction it was made clear that communication with parents or with a tutor is a condition for language development. However more conditions are necessary for language and in addition knowledge development. The speech production system should function adequately. Children who are language impaired get disadvantaged and show a lag in language development. The study of language impaired children shows that systematic intervention during sixty sessions showed language improvement only in a capacity training. Also the importance of memory in subject-verb agreement tasks became clear.

The content of language education can be derived from the general goals of education. The development of cognitive constructs from solving different categories of problems in a balanced way has to start early in education.
REFERENCES


Kristiina Kumpulainen and Mika Mutanen

COMMUNICATION AND THE CONSTRUCTION OF KNOWLEDGE IN JOINT PROBLEMS SOLVING - A CHALLENGE FOR INTERACTION ANALYSIS

This paper introduces a descriptive system of analysis of peer interaction in collaborative learning situations. The method takes a dynamic and process-oriented approach to peer interaction which is seen as situationally developed in students' moment-by-moment interactions. By concentrating on individual and group functioning, the method aims to investigate the different patterns of practice in peer-directed interactions and how these create opportunities for student learning. The method consists of a three-level parallel analysis of peer interaction focusing on peer discourse, cognitive processing and social processing. These are investigated with the help of structural maps drawn out from the data based on video recordings, transcriptions, observations, interviews, and questionnaires. In the first part of the paper the theoretical and methodological background of the analysis will be discussed. That is followed by an introduction to the analysis method highlighted with empirical examples. The paper finishes with a reflective analysis of the method.

Introduction

A central question around which recent research on learning and instruction has concentrated is how social interaction, particularly discourse, mediates the construction of knowledge in classrooms. There exists research which has explored the ways in which knowledge is situationally appropriated in classroom discourse (Bergqvist & Säljö, 1995; Edwards, 1993; Lemke, 1990; Mercer, 1995; Wells & Chang-Wells, 1992). There are also research studies which have investigated teachers’ use of discursive strategies to scaffold students’ learning (Palincsar, 1986; Palincsar, & Brown, 1984). Other studies of discourse and learning have focused on students’ social and cognitive representations in classroom conversation (Barnes & Todd, 1977; Sharan & Shachar, 1988; Teasley, 1995; Webb, Troper, & Fall, 1995). More sociolinguistically oriented research on language socialization and classroom learning has, on the other hand, looked at the primary discourses of children’s home and community lives and the ensuing impact of such differences on children’s learning across the curriculum (Cazden, 1988; Delamont, 1976; Phelan, Davidson, & Cao, 1991). In the light of current research it is clear that classroom interac-
tion is seen as a significant tool for learning which should be approached from different perspectives in order to deepen our understanding of the practice of learning in and through social interaction.

New learning environments employing student-centered learning activities, collaborative working modes, authentic learning contexts, and technological innovations (see e.g. Brown & Campione, 1994; Cohen, 1994; O'Malley, 1995; Scardamalia & Bereiter, 1994) are changing the nature of social interaction in classrooms, thus, affecting the roles of the teacher and students as communicators and learners. Along with the new learning environments students are seen as having more opportunities to participate, observe, reflect on, and practise socially shared ways of knowing and thinking. Extended student discourses can be regarded as a significant window onto their appropriation of knowledge in different educational contexts. Yet, the mere opportunity for social interaction and discourse will not necessarily lead to learning experiences, unless serious attention is paid to the patterns of students’ interactions and how these create opportunities for their learning. It is clear that wider research is needed in this area and, in particular, that a more sophisticated methodology is required.

The present paper introduces a methodological approach to the analysis of peer interaction in educational contexts. The method takes a dynamic and process-oriented perspective to peer interaction which is seen as situationally developed in students’ evolving interactions. The main goal of the method is to highlight the different patterns of practice constructed in peer-directed groups and how these create opportunities for student learning. In the first part of the paper the theoretical and methodological background of the analysis will be discussed. This is followed by an introduction to the analysis method highlighted with empirical examples. The paper finishes with a reflective analysis of the method.

Social interaction and learning

Recent views of learning emphasize its social and situated nature regarding the construction of knowledge both as an interpersonal and intrapersonal process. Learning is seen to take place as the result of the child’s active involvement and participation in situated social practices and not as the result of knowledge transmission. Views originating from the Piagetian theory of learning stress the importance of social processes in the individual’s knowledge building (Perret-Clermont, Perret, & Bell, 1991; Piaget, 1970; Teasley & Roschelle,
1993; Tudge & Rogoff, 1989). Cognitive conflicts created by divergent point of views and their resolution in peer interactions are seen as affecting intrapersonal processes (Doise & Mugny, 1984). Moreover, social learning contexts are found to promote explaining to others and self-explanations often leading to cognitive gains (Schwartz, 1995). Consequently, collaborative working modes are regarded as creating effective learning environments for students to express, discover and construct their knowledge structures at a more abstract level than whilst working on the same problem alone (Light, Littleton, Messer, & Joiner, 1994; Schwartz, 1995).

The sociocultural perspective, which views learning from the cultural point of view, emphasizes the role of social interaction in the movement from interpersonal to intrapersonal functioning (van der Veer & Valsiner, 1994; Vygotsky, 1962, 1978; Wertsch, 1985; Wertsch & Stone, 1985). In the light of this approach, the active construction of knowledge takes place by participating in activities guided by adults or more competent peers in sociocultural environments (Cole & Griffin, 1980; Lave & Wenger, 1991; Rogoff, 1990). Thus, social processes are seen as giving rise to individual processes which are both seen as being mediated by tools created by the culture. According to this perspective, the development of mind is related to both biological development as well as to the appropriation of cultural heritage which works as a mediating tool for humans to interact with each other and with the physical world (Cole, 1996; Wertsch, 1991).

In the sociocultural perspective to learning, particular emphasis is put on the mediation of action through tools on the development of the mind (Cole & Wertsch, 1997; Harré & Gillett, 1994; Vygotsky, 1962, 1978; Wertsch, 1985, 1991). Semiotic artifacts are defined as cultural amplifiers which are central to the appropriation of knowledge through representational activity by the developing individual (John-Steiner & Mahn, 1996). Although language is seen as one of the main sources of mediational means, they also include various other cultural artifacts such as different symbol systems and schemes, maps and works of art (Cole & Wertsch, 1997). By stressing the interdependence of social and individual processes in the co-construction of knowledge, the sociocultural approach views semiotic tools as personal and social resources, and, hence, uniting the link between the social and the individual (Vygotsky, 1962, 1978).

In the light of sociocultural perspective and numerous theorists of language and meaning (e.g. Bakhtin, 1981, 1986; Bruner, 1990; Halliday & Hasan, 1989;
Lemke, 1990; Vygotsky, 1962) interaction implies communication, social meaning construction, which is socially situated and which sustains social relations. Therefore, explorations between interaction and learning need to concentrate on the interpretation of meanings and purposes in interaction situations. This interpretation should consider the social situation as well as the sociohistorical context of the activity (Bakhtin, 1986; Vygotsky, 1978; Wertsch, 1991).

The importance of considering the interdependency between individual and social environment has been pointed out by a number of researchers working within the socioconstructivist and sociocultural framework (e.g. Grossen, 1994; Light & Perret-Clermont, 1991; Rogoff, 1990; Wertsch, 1985, 1991). According to these views, the nature of an individuals' activity and cognitive performance cannot be isolated from it's social and cultural contexts. The considerations of the dialogical and dynamic relationship between individual and environment have led to the situative view of learning (Brown, Collins, & Duguid, 1989; Greeno, Smith, & Moore, 1993; Greeno, 1997; Lave & Wenger, 1991) which focuses on the development of participation in valued social practices and on learner identity rather than on individuals' knowledge and contexts of performance.

The notion of context should not only be limited to the physical environment. Instead a more dynamic approach is necessary. It holds that contexts are actively created in situated interactions: They are continuously shaped by social and interactional meanings as well as by participants perceptions and interpretations of the situation (Edwards & Potter, 1992; Grossen, 1994; Lemke, 1990). Schubauer-Leoni & Grossen (1993) highlight the multidimensional nature of contexts by identifying three different levels: the socio/cultural, institutional and interindividual contexts. They argue for their recognition in the analysis of the complex relationship between an individual's activity and social context, both at theoretical and methodological levels.

Peer interaction

Teacher-student interaction often differs from peer interaction in its degree of reciprocity (Forman, 1989). In teacher-student interactions the distribution of power and knowledge are usually unequal. The teacher controls the content of interaction and distribution of speaking turns. In peer interaction the relationship between the participants is often more equal. This results in a more symmetrical control of communication both in terms of turn taking and con-
tent (Rommetveit, 1985). Consequently, peer directed learning interaction, in which different opinions, definitions and interpretations are freely expressed and created, is usually more conversational in nature (Cohen, 1994; Hicks, 1995; Maybin, 1991). Moreover, in peer interaction the communicative options available to children are much wider during which each may take turns at instructing the other (Forman, 1989).

For effective learning interaction it is necessary that participants have a shared understanding of the task and its goals (Edwards & Mercer, 1987; Forman and Cazden, 1985; Rogoff, 1990). This is often referred to as intersubjectivity (Rommetveit, 1985). Language and communication play an important role in building a common understanding of the situation between the participants. However, in order to create intersubjectivity, participants also need to have established ground rules for their interaction. These are constructed over the course of a shared history between the participants (Mercer, 1995). Different dimensions are working in interaction which are linked to the nature of interpretations and meanings created in the interaction context. These are related to the participants’ socio-cognitive and emotional processes as well as to their perceptions of the aims of the activity in question (Grossen, 1994). Vion (1992) when characterizing the complexity of the interaction situation introduces the concept of heterogenous interactive space. This refers to the social, cognitive and interactive roles and contexts which interactors have to negotiate in order to achieve intersubjectivity (cf. Grossen, 1994). In addition to the importance of creating intersubjectivity, other features identified to be conducive to effective learning interaction in peer group situations are an appreciation of the purpose and goals of the task and relevant vocabulary used, an acceptance of educational agenda, and a willingness to speculate, make hypotheses and use valid evidence (Fisher, 1996).

Although discourse plays an important role in creating intersubjectivity, a shared understanding may in some situations be achieved without verbal communication. Being in the same task situation with others and sharing the task and its tools as well as the whole process of problem solving can create a joint collaboration space for the participants (Teasley & Roschelle, 1993). Studies of young children have shown that they often use non-verbal communication to share meanings and achieve interpersonal co-ordination of actions in social play (cf. Verba, 1994). Also, a study investigating peer interaction during the process of collaborative writing with a word processor showed that the actual computer tool played a role in the construction of intersubjectivity between primary aged children (Kumpulainen, 1996). Methodologically there
are problems in interpreting non-verbal communication, but some limitations may be overcome by using triangulated research methods to focus on peer interactive dynamics as a whole (Verba, 1994; Westgate & Hughes, 1997). Student interviews, particularly stimulated recall interviews, in addition to observations, and transcriptions of verbal interactions can provide significant information about the student's cognitive, social and emotional processes, and consequently increase understanding about the interactive activity from a holistic perspective.

Studies of peer interaction - focus on methodology

Peer interaction has already been studied quite extensively in different educational contexts. The research objectives and methodological solutions have also been diverse, being linked with the theoretical perspectives adopted by the researchers (see e.g. Edwards & Westgate, 1994 for a review). One large group of studies focusing on peer interaction from the educational perspective is located in the systematic tradition, often called as the process-product-studies of peer interaction (e.g. Joiner, Messer, Light, & Littleton, 1995; Light, et al, 1994; King, 1989; Teasley, 1995; Tudge, 1992; Webb, et al., 1995). In these studies, peer interaction is analyzed with coding schemes which categorize interaction into pre-defined categories. Variables like student achievement and performance are statistically linked to the frequency of categories as identified in the data. Usually, the development of the actual interaction process or meaning construction in interaction is not the prime interest, but the focus is rather on some specific features of the interaction and their relationship to student learning or achievement. Consequently, the temporal process of interaction is not highlighted by such studies. The situated nature of interaction is also often left for minor inspection. One advantage of the process-product studies is that they enable the analysis of large amounts of data and use of publicly-verifiable criteria to make the categorizations.

Two of the most well known researchers of peer group talk and learning are Barnes and Todd (1977, 1995) who developed an analytic method for studying peer group talk. Their system of analysis was "grounded" in the data rather than having been a pre-existing grid. Consequently, the system tries to take account of the context in which peer talk occurs. In this sense their approach can be viewed as allied to ethnography. In their analysis Barnes and Todd were interested in the actual process of interaction. They were interested in the ways students developed and constructed knowledge without direct teacher presence. In their analysis, a distinction is made between interactive and so-
cial aspects of speech events. This was realized by a two-level parallel analysis which at first level focuses on the coherence of discourse and at the second level concentrates on social skills and cognitive strategies employed by the students in their discourse. While conducting their study on peer group talk across a range of discussion tasks, Barnes and Todd realized how difficult it was to identify logical relationships from peer interaction since these are often left more implicit than given a verbal form. The fact that Barnes and Todd had only tape-recordings of peer talk made the analysis even more difficult in terms of logical development. Despite some limitations found in the analysis system and tools used for data collection, Barnes and Todd’s work makes an important contribution to the analysis of peer talk since it unites ideas from discourse and conversational analysis with research on learning and instruction. Particularly, with their definitions of content frames and interaction frames it is possible to investigate how students bring their frame of reference to the interaction situation and how these frames are jointly negotiated and developed.

Many methods of analysis of peer group interaction, either with distinct categories or more analytic modes, have been developed after Barnes and Todd’s system. To review all of them in one paper would be impossible and not worthwhile. One recent analytic approach which has contributed to our understanding of children’s talk during small group learning is the one developed by Mercer (1994, 1996), Fisher (1993), and by the researchers involved in the SLANT project (see Mercer, Phillips, & Somekh, 1991). What is interesting in this approach is that it tries to investigate how children use talk to think together, thus, it uses a group as a unit of analysis, not individual children. By taking a socio-cultural approach to children’s talk, it tries to show that particular ways of talking permit certain social modes of thinking. The analytic framework was derived from their analyses of children’s talk during collaborative peer group learning with computers and it includes three distinct modes of talk which characterize different ways of thinking together. These are 1) Disputational mode characterized by disagreement and individualized decision making, 2) Cumulative mode consisting of positive but uncritical decision making, and 3) Exploratory mode which is seen as the most effective mode of speaking in fostering critical thinking and cognitive development (Mercer, 1996). It is characterized by constructive and critical engagements, including argumentation and hypotheses testing. Theoretically, this analytical framework makes a significant contribution towards increasing understanding of the different modes of talk and social thinking in peer group situations. The limitations of this method can, on the one hand be found, in that the unit of analysis is the group
- the method does not take into account individual students' participation in the "social modes of thinking". Consequently, the method does not highlight how the different types of social thinking are actually constructed within peer groups. On the other hand, by concentrating mainly on students' talk, the analysis may not always give a complete picture of the nature of knowledge construction in peer groups. Instead, a more dynamic and process-oriented approach to peer interaction is necessary, which focuses on the whole interactive context and its development, including non-verbal communication and the use of different tools, is necessary if we want to understand the practices of knowledge construction in collaborative peer group learning.

**Method**

In this paper we propose a descriptive system for investigating the processes and dynamics of peer interaction during collaborative small group learning. The analysis is realized with a microanalysis of evolving peer interactions focusing on three dimensions, namely peer discourse, cognitive processing and social processing. These terms will be further clarified in the following discussion. The method has been developed as a result of a number of studies we have conducted of primary aged students' interactions in collaborative peer-directed groups in various educational contexts both in Finland and in Britain (Fourlas & Wray, 1990; Kumpulainen, 1994, 1996; Kumpulainen & Mutanen, in press). The main goal of the analysis method is to highlight the processes of learning practices in collaborative peer groups from both the individual and the peer group's point of view. Consequently, in the analysis we are not only interested in the group as a unit but also in seeing how individuals participate and contribute to the socially constructed interaction. Analysis of this nature enables the investigations of representational frames as well as the social/interactional frames of the participants (Barnes & Todd, 1977, 1995). The theoretical grounding of the method is informed by the sociocultural and socioconstructivist perspectives to interaction and learning (Cole, 1996; Mercer, 1995; Perret-Clermont, et al., 1991; Wertsch, 1991), whereas the methodological solutions presented are greatly influenced by the work of Barnes and Todd (1977, 1995), Mercer (1994, 1996) as well as by interactional ethnographers (Green & Wallat, 1981; Green & Mayer, 1991; Tuyay, Jennings, & Dixon, 1995).

In the method, learning is seen to take place as a result of individuals' active participation into the practices of the social environment. Learning is viewed as an interactional process that requires an understanding of language and
other semiotic tools as both personal and social resources (Cole, 1996; Halliday & Hasan, 1989; Wells & Chang-Wells, 1992). Peer interaction is treated as a dynamic process in which language and other semiotic tools are used as instruments of communication and learning. Interaction is seen as a complex social phenomena which is composed of non-verbal and social properties in addition to its verbal characteristics. Peer discourse itself is not treated as representing a person's inner cognitive world, nor even as descriptive of an outer reality but rather as a tool-in-action shaped by participants' culturally-based definitions of the situation (Edwards, 1993; Edwards & Potter, 1992).

Analysis framework

The analytic method consists of a three-level parallel analysis focusing on 1) peer discourse, 2) cognitive processing, and 3) social processing. Whereas the analysis of peer discourse concentrates on students' verbal language, the analysis of students' cognitive processing and social processing focus on interactive dynamics from a holistic perspective by taking account of students' verbal, co-verbal and non-verbal behavior as well as the use of tools in students' joint activity. In this connection, it is important to emphasize that the three dimensions on which the analysis concentrates are brought up only for analytical purposes, although it is recognized that they are closely linked together in a complex way.

Dimension 1: Analysis of discourse functions

The analysis of peer discourse focuses on the functions of students' verbal communication. It investigates the purposes for which language is used in a given context and highlights the communicative strategies applied by individual students taking part in an interaction situation (Halliday & Hasan, 1989). Analysis of this nature is often seen as concentrating on the illocutionary force of an utterance, that is, on its functional meaning (Austin, 1962; Edwards & Westgate, 1987). The functions for which students use their oral language are linked to the individuals' expectations and evolving interpretations of the situation shaped by the current situation and the sociocultural context. The functions for which oral language is used in the course of interaction serve both intra- and interpersonal purposes: On the one hand, the purposes and intentions carried by means of oral language serve an ideational, i.e. cognitive function. On the other hand, they serve an interpersonal function relating to the personal and social relationships between the interactors (Halliday & Hasan, 1989).
The identification of functions in peer discourse takes place on the basis of implicature, that is, what a speaker can imply, suggest or mean may be different to what the speaker literally says. Consequently, the functions are not identified on the basis of linguistic form. Rather, they are identified in context in terms of their retrospective and prospective effects on the actual discourse. Data gathered by means of observations and student interviews also give understanding to the functions for which students use their verbal language in the interaction situation. The functions of peer discourse are the minimum units analyzed in the system. They are identified on an utterance basis and defined in terms of source, purpose and situated conversational meaning. An utterance is viewed as a meaningful unit of speech, i.e. a message unit. The boundary between each utterance is linguistically marked by contextualization cues. Given that an utterance may serve multiple functions, more than one function can be recorded for each utterance.

Examples of language functions we have often identified in peer discourse across different collaborative learning contexts are the Informative, Expositional, Reasoning, Evaluative, Interrogative, Responsive, Organisational, Judgmental (agrees/disagrees), Argumentational, Compositional, Revision, Dictation, Reading aloud, Repetition, Experiential, and Affectional functions. Some of these functions describe the nature of interaction more from the activity point of view (e.g. dictation, reading aloud), where as others take a more interpretative/cognitive (e.g. informative, reasoning, evaluative) or social perspective (e.g. affectional, responsive, judgmental) on the analysis of peer discourse. However, neither of the functions could be clearly seen as only reflecting one of these dimensions. Consequently, each function in the framework is regarded as reflecting the social-cognitive-discursive actions of the participants as they verbally interact in their collaborative endeavors. The functions in the system are defined further in Table 1. The functions for which peer discourse is used in the course of joint problem solving often differ across situations and contexts, thus, these functions presented in the system should not be understood as fixed, pre-defined categories. Instead, the functions must be situationally defined for each interaction situation on a post hoc basis.

**Dimension 2: Analysis of cognitive processing**

In addition to the functional analysis of peer discourse, the method analyses the nature of students’ cognitive and social processing in their joint activity.
These two dimensions are examined by investigating peer interactional processes as they occur across participants. Consequently, a group is taken as a unit of analysis. In the analysis, students’ cognitive processing, e.g. cognitive activity, is seen as being composed of verbal, co-verbal, and non-verbal activity. This, attention is paid to the whole interactive context not just discourse. In our investigations we have distinguished three broad modes to characterize the nature of students’ cognitive processing during collaborative learning activities: Procedural processing refers to the routine execution of tasks without thorough planning or thinking. Ideas are not developed, rather they are cumulated or disputed without constructive judgments or criticism. Students’ work is often product-oriented and concentrates on procedural handling of information. Interpretative or exploratory processing, on the other hand, refers to a situation during which thinking is made visible through language or other tools and the whole activity is focused on strategies, planning, and hypotheses testing. Students’ activity reflects their deep engagement and interest in the problem solving task. Off-task activity refers to a situation during which students’ activity does not focus on task, e.g. playing around, discussing break time activities, "absent minded" activity.

**Dimension 3: Analysis of social processing**

In our analysis of peer interaction we have also concentrated on investigating the nature of students’ collaboration, i.e. social processing. The different modes in which social processing is often constructed in peer interaction are, for example, collaborative, tutoring, argumentative, individualistic, dominative, conflict, and confusion modes. The latter characterizes interaction during which there is an obvious misunderstanding or lack of intersubjectivity between the children. The conflict mode reflects disagreement, usually at a social level. The dominative mode reflects the distribution of power and status in the peer group. The individualistic and dominative modes are contrasts to collaborative interaction. The individualistic mode implies that students are not developing their ideas together but rather as working individually in the group. The dominative reflects imbalance in students’ social status and power. The argumentative and tutoring modes of interaction are closely related to collaboration itself. In a sense they can be regarded as submodes of collaboration. The argumentative mode implies constructive interaction in which students negotiate their differing understandings in a rational way by giving judgments and justifications. This often finishes into a shared understanding of the situation. The tutoring mode shows children helping and explaining for the purpose of assisting the other to understand the matter at hand. It is related into a scaf-
folding situation more characteristic of an adult-child interaction (Wood, Bruner, & Ross, 1976). The collaborative mode includes interaction in which there is a mutual understanding of the situation, ideas are jointly negotiated, and discourse is coherent. In collaborative interaction children often create bi-directional zones of proximal development assisting one another (Forman, 1989).

It must be noted that apart from the functional analysis of peer discourse the unit of analysis for the different modes of cognitive and social processing are not defined with distinct rules, such as an utterance basis. Instead the units of analysis for the modes of cognitive and social processing are based on their development in peer interaction on a moment-by-moment basis. In other respects the three dimensions on which the analytical framework concentrates, all emerge from the data as the result of researchers and, when possible, also interactors interpretations of the situation. The analysis method is summarized in Table 1 shown below.
### TABLE 1. A three-level parallel approach to peer interaction: Focus on peer discourse, cognitive and social processing

<table>
<thead>
<tr>
<th>DIMENSION</th>
<th>ANALYTICAL CATEGORIZATION</th>
<th>DESCRIPTION</th>
</tr>
</thead>
<tbody>
<tr>
<td>COGNITIVE PROCESSING</td>
<td>exploratory/interpretative</td>
<td>EXP  Critical and exploratory activity which includes planning, hypothesis testing, evaluation, experimenting</td>
</tr>
<tr>
<td></td>
<td>procedural/routine</td>
<td>PROC procedural on-task activity which focuses on executing the task without reflective analysis</td>
</tr>
<tr>
<td></td>
<td>off-task</td>
<td>OFF activity not related to the task</td>
</tr>
<tr>
<td>SOCIAL PROCESSING</td>
<td>collaborative</td>
<td>COL joint work in which all the pupils contribute to sharing and constructing knowledge together</td>
</tr>
<tr>
<td></td>
<td>tutoring</td>
<td>TUTO student helping and assisting another student</td>
</tr>
<tr>
<td></td>
<td>argumentative</td>
<td>ARGU students are faced with cognitive/social conflicts which are resolved and justified in a rational way</td>
</tr>
<tr>
<td></td>
<td>individualistic</td>
<td>INDI student(s) working on individual tasks with no sharing</td>
</tr>
<tr>
<td></td>
<td>domineative</td>
<td>DOMI student dominating the work</td>
</tr>
<tr>
<td></td>
<td>conflict</td>
<td>FLCI social or academic conflicts</td>
</tr>
<tr>
<td></td>
<td>confusion</td>
<td>FUSI student(s) do not understand the task or each other, often includes silent episodes</td>
</tr>
<tr>
<td>DISCOURSE FUNCTIONS</td>
<td>Informative</td>
<td>I    providing information</td>
</tr>
<tr>
<td></td>
<td>Reasoning</td>
<td>RE   reasoning in language</td>
</tr>
<tr>
<td></td>
<td>Evaluative</td>
<td>EV    evaluating work or action</td>
</tr>
<tr>
<td></td>
<td>Interrogative</td>
<td>Q    asking questions</td>
</tr>
<tr>
<td></td>
<td>Responsive</td>
<td>A    answering questions</td>
</tr>
<tr>
<td></td>
<td>Organisational</td>
<td>OR    organising or/and controlling behavior</td>
</tr>
<tr>
<td></td>
<td>Judgmental:</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Agrees/Disagrees</td>
<td>Ja/Jd expressing agreement or disagreement</td>
</tr>
<tr>
<td></td>
<td>Argumentational</td>
<td>AR    justifying information, opinions or actions</td>
</tr>
<tr>
<td></td>
<td>Compositional</td>
<td>CR    creating text</td>
</tr>
<tr>
<td></td>
<td>Revision</td>
<td>RV    revising text</td>
</tr>
<tr>
<td></td>
<td>Dictation</td>
<td>DI    dictating</td>
</tr>
<tr>
<td></td>
<td>Reading aloud</td>
<td>RE    reading text</td>
</tr>
<tr>
<td></td>
<td>Repetition</td>
<td>RP    repeating spoken language</td>
</tr>
<tr>
<td></td>
<td>Experiential</td>
<td>E     expressing personal experiences</td>
</tr>
<tr>
<td></td>
<td>Affectional</td>
<td>AF    expressing feelings</td>
</tr>
</tbody>
</table>
Empirical examples

In the following, the methods and analysis underpinning the present approach are highlighted with empirical examples. The main goal is to demonstrate the holistic and process-oriented approach applied in the method as well as to define and justify the three parallel dimensions on which the analysis focuses. The examples also give ideas of the nature of information the present method is able to provide in relation to students’ learning practices: The analytical maps, figures and summaries of students’ interactions give new ideas for data reporting and also highlight the different opportunities the method provides for investigating and interpreting collaborative learning activities in peer-directed groups.

Research setting and data collection

The experimental examples presented result from a case study of peer interaction during collaborative learning activities. 12-year old students from one Finnish primary class participated in the study. The students worked in pairs on tasks located in mathematics and science. The tasks were designed to be suitable for group work activities and consisted of open-ended problems. The data were gathered by means of videotapes with real-time information, direct observations, transcriptions, stimulated recall interviews, questionnaires and field notes from pre-study observations. The triangulation of research methods was considered necessary to increase the validity of interpreting the interactive practices taking place.

The research was conducted in a classroom of the Learning Research Center of Kajaani Department of Teacher Education. The classroom is equipped with multiple technical instruments to provide effective data collection and it is furnished with interesting technicalities like a one-way window for observation. The classroom space resembles a normal classroom environment with chalkboards, chairs, tables, plants and carpets. The center is located close to the students’ primary school and, hence, it is easy to access. The students were already accustomed to working in the classroom since they had taken part in other teaching/research activities in the center. To get a high quality record of children’s interactions, the center, with its modern technology, was considered as offering better conditions for data collection than a classroom in a primary school. This was necessary since the research project aims at developing appropriate methodology to analyze peer interaction in collaborative peer group learning situations.
Each data collection session was videotaped as a whole and supplemented with the researchers’ field notes. The videotapes included real-time information of the students’ working processes. Three pairs of students were video-recorded at any one time in the classroom. One session lasted between 25 and 45 minutes. After finishing the task, the students were asked to fill in a questionnaire which aimed at shedding more light onto their collaboration and attitudes towards the tasks. Stimulated recall-interviews were also held for each student individually in order to clarify the students’ working strategies and understanding of the concepts dealt within the task, as well as to investigate the nature of their collaboration and interaction. The stimulated recall-interviews were audio taped.

The data were analyzed in several phases. In the first phase, the video material of the students’ collaborative activities and interaction were examined together with the field notes written down during the data collection. Next, the verbal interaction of the pairs was transcribed, the questionnaires encoded, the students’ work assessed and interviews summarized. After that, the interaction and behaviors apparent in videotapes were analyzed by taking account of the real-time information as well as by following the written transcripts. Particular attention was paid to the nature of peer discourse, cognitive processing and collaboration. The other features observed and analyzed involved the students’ use of the instructional tools available in the problem solving situations (e.g. texts, computer, cards, etc.) and the students’ construction of time and task processing within their activity. The data analyzed were reflected against the contextual knowledge acquired through observations, stimulated recall interviews and pre-study teaching experiences in the classroom. The data were collected and analyzed by two researchers together. Disagreements concerning the analysis of peer interaction were negotiated until joint agreement was established.

**Analytical maps**

In order to highlight the dynamics of peer interaction, analytical maps have been created for each peer group under investigation. The product of analysis is a series of situation specific analytical maps that describe the sequential evolution of peer interactions as they are constructed by students interacting with and acting on each other’s messages. The construction of the maps helps one to conceptualize the complex and rich data of peer interaction in a coherent framework. In addition to the three-level parallel analysis of peer interaction, the maps show additional contextual information, such as the stu-
dents’ processing of the problem solving task and the use of different tools, as well as the construction of time in students’ work. At the end of each analytic map there is a summary of students' interactive activity.

Case 1. Task description

The collaborative problem solving task in mathematics was located in geometry and its aim was to exercise children’s ability to visualize three-dimensional objects pictured on their exercise paper. The visualization was objectified with cards characterizing the faces of different geometrical objects. The children were asked to choose those faces that formed the geometrical object on their exercise paper. The faces were numbered and after the children had chosen the cards they had to write down the numbers. The pictures of the geometrical objects could be visualized in different ways and, hence, there was more than one correct answer.

Table 2 shows an abbreviated version of an analytical map of a peer group working on the mathematics task. In the discourse functions column, each speaker is identified with a different font to highlight the sequential evolution of the interactions, as well as to investigate the nature and patterns of each speakers’ participation in the interaction situation. Each column in the map should be read from left to right, line by line. The highlighted episode in the map is analyzed further in Extract 1.
### TABLE 2. An analytical map of peer interaction: The case of Sami and Teemu

**PUPILS:** Sami and Teemu & (teacher)

**SESSION:** L2 Mathematics

<table>
<thead>
<tr>
<th>TIME</th>
<th>DISCOURSE FUNCTIONS</th>
<th>COGNITIVE PROCESSING</th>
<th>SOCIAL PROCESSING</th>
<th>CONTEXT INFORMATION</th>
</tr>
</thead>
<tbody>
<tr>
<td>09:09:40</td>
<td>OR, OR</td>
<td>organising working</td>
<td>collaborative</td>
<td>instruction ends 09:09:40</td>
</tr>
<tr>
<td>09:10</td>
<td>OR, J, OR, J, RS, OR, Q(RS), A(AR), J, RS, RS, RS, Q(RS), A(RS), AR, OR, EX, J, RS, RS, RS</td>
<td>exploratory solving</td>
<td>collaborative</td>
<td>task no. 1 begins</td>
</tr>
<tr>
<td>09:11</td>
<td>A(AR), AR, J, RS, OR, RS, OR, J, RS, OR, EX, OR, AR, OR, RS, RS, AR, RS, RS, Q(RS), A(RS), AR, J, RS, EX</td>
<td>exploratory solving</td>
<td>collaborative - tutoring</td>
<td>task no. 1 continues</td>
</tr>
<tr>
<td>09:18</td>
<td>AR, EX, J, EX, Q(R), RS, RS, DI, RE, EV, Q(R), RP, EV, OR, EV, EX, Q(AR)</td>
<td>speculative solving</td>
<td>collaborative - tutoring</td>
<td>task no. 6 begins</td>
</tr>
<tr>
<td>09:19</td>
<td>A(EX), AR, AR, OR, RS, EX, J, RS, RS, AR, Q(RS), A(RS), AR, J, RS</td>
<td>speculative - exploratory solving</td>
<td>collaborative - tutoring</td>
<td>task no. 6 ends</td>
</tr>
</tbody>
</table>

...continues...

<table>
<thead>
<tr>
<th>TIME</th>
<th>DISCOURSE FUNCTIONS</th>
<th>COGNITIVE PROCESSING</th>
<th>SOCIAL PROCESSING</th>
<th>CONTEXT INFORMATION</th>
</tr>
</thead>
<tbody>
<tr>
<td>09:22</td>
<td>RS, OR, J, OR, J, J, RS, OR, J, RS, OR, OR, J, OR, J, OR, J, J, J, I, OR, J, OR, J, J, J, I</td>
<td>exploratory solving</td>
<td>collaborative - contact with the teacher</td>
<td>task no. 6 ends</td>
</tr>
</tbody>
</table>

**SUMMARY**  

**Total time =** 13:15

**DISCOURSE FUNCTIONS**

- **COGNITIVE PROCESSING:** The nature of peer discourse is mostly characterized by the reasoning (f=66, 25.7%), judgmental (f=45, 17.8%), organizational (f=39, 15.2%), argumentative (f=31, 14.4%), evaluative (f=14, 5.4%) and demonstration (f=14, 5.4%) functions.

- **SOCIAL PROCESSING:** The pair's processing of the task is composed to a great extent of a task-oriented problem solving including the organization of working processes and exploratory activity, characterized by intensive negotiation and high-level reasoning of the problems encountered. Also many speculative episodes are found in which the students are doubtful about the solution or the opinions of the partner. The speculative episodes are often followed by testing episodes during which solutions and opinions are tried out.

- **CONTEXT INFORMATION:** The social interaction of the pair is coherent and highly collaborative reflecting mutual understanding and equal participation in problem solving activities. The collaborative nature of interaction is also highlighted by tutoring and argumentative episodes during which the students are helping one another to grasp their way of thinking and understanding. The amount of help provided by the teacher is minimal reflecting the pair's self-regulation and control of the problem solving task.

**Tasks 1 through 5 were solved quickly and without much difficulties. Task 6 took a little more effort and time to solve, but was finally accomplished successfully. The quality of the pair's work was assessed to be 11 points out of 12.**
The distribution of the language functions in the students’ talk is highlighted in Figure 1.

**FIGURE 1. The distribution of the frequency of the language functions across pupils**

Figure 1 shows that there were differences between the students’ in their verbal language use. Whereas Sami seems to agree more often with the ideas and suggestions created (Ja; f=26/15), Teemu is more involved in reasoning (RS; f=40/22), evaluating (EV; f=12/4) and demonstrating (EX; f=10/4) during their joint problem solving. These differences may reflect the students’ working strategies or/and task orientation.

The dynamics of Teemu’s and Sami’s interactive activity is summarized in the following Figure 2. The figure focuses on two dimensions, namely on the nature of students’ cognitive and social processing. The x-axis describes the nature of students’ cognitive activity, whereas the y-axis characterizes students’ social activity. In the figure the processes of students’ interactions are coded on a minute by minute basis. The students’ whole activity is divided into three time units: the white dots indicate the nature of students’ working processes in the first third of their problem solving activity, the gray dots highlight the second third, whereas the black dots show the last third of the nature of
the students’ activity in this specific problem solving task. This summary figure should be seen as a conceptual tool that helps to understand the processes of peer interactive activity from a holistic perspective rather than a precise coding of the “level” of peer interaction at different points of students’ work.

**FIGURE 2.** A summary of students’ interactive activity: *The case of Sami and Teemu*

As can be noticed from the data presented above, the social interaction of the pair is highly collaborative including tutoring and argumentative episodes during which the partners help one another, usually by explicating their point of view through discourse, and action, as well as with the help of the tools they are using. The cognitive activity of the pair reflects intensive task engagement and is very exploratory in nature during which strategies and solutions are jointly created and tested. The following extract shows an example the nature of students’ verbal interaction in this specific mathematics task.
As can be noted from the transcript, Teemu first questions, in a critical manner, why they should put a particular card at the bottom. In order to make his understanding clear, Sami, in turn, explains why he thinks the solution is correct. Teemu is still not convinced and argues further. Speculation and disagreement lead both children to test their ideas in practice as well as to investigate the problem in depth by looking closely at the paper in which the geometrical object is presented. The argumentation episodes lead the students to reason their points of views over and over again. As can be seen from Table 2 and Figure 2, the interactions of the pair were collaborative and exploratory in nature throughout the task.
The analysis of this example shows that the actual context, particularly the handling of the cards and their construction into the geometrical objects, plays an important role in the group's social interaction of which knowledge construction is a part. This highlights the importance of taking account of the whole context, including action, non-verbal communication and the use of tools in the analysis of peer interaction. Consequently, the investigations of peer interaction should not solely rest on peer discourse.

Case 2. Task description

During the science study, the students worked on a task dealing with the nuclear energy. The students' task was to investigate the theme and make a summary of their investigations on A3-sized paper by using text, pictures, figures, charts, tables etc. The multimedia software used was a Finnish version of the CD-ROM program "Science" by Dorling Kindersley. The students' ability to use the computer program was checked and rehearsed before the study and was found sufficient for the execution of the task. In the study, one of the researchers worked as a teacher in the classroom and gave any necessary help to the students. At the beginning, the students were given task instructions and encouraged to work collaboratively. Table 3 characterizes the interaction and working processes of one peer group whilst working in the science task. The highlighted episode in the map is discussed further in Extract 2.
TABLE 3. An analytical map of peer interaction: The case of Saku and Jani

<table>
<thead>
<tr>
<th>TIME</th>
<th>DISCOURSE FUNCTIONS</th>
<th>COGNITIVE PROCESSING</th>
<th>SOCIAL PROCESSING</th>
<th>CONTEXT INFORMATION</th>
</tr>
</thead>
<tbody>
<tr>
<td>11:16:10</td>
<td>OR, C, OR, J, Q(l), OR, J, RE, EV, AR, Q(R), J</td>
<td>organising working</td>
<td>collaborative</td>
<td>working begins</td>
</tr>
<tr>
<td>11:17</td>
<td>OR, RE, OR, OR, AF, RP, C, OR, Q(OR), AF, J, C, OR, AP, C, OR, OR, AF, J, J, OR, RE, C,</td>
<td>organising working</td>
<td>domineering</td>
<td>duplication, confusions, silence</td>
</tr>
<tr>
<td>continues...</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>11:27</td>
<td>DI, OR, DI, Q(OR), A/OR, DI, RP, OR, Q(OR), A(RP), DI, RP, DI, EV, EV, Q(l), A(l), DI, OR, DI, OR, DI, OR, DI, RP, OR, DI,</td>
<td>procedural working, organising working</td>
<td>collaborative, divided roles</td>
<td>copying continues</td>
</tr>
<tr>
<td>11:28</td>
<td>OR, RE, OR, J, J, OR, OR, I, OR, Q(l), OR, OR, DI, OR, OR, Q(RP), A/OR, DI, RP, DI, RP, DI,</td>
<td>procedural working, organising working, play activity, organising working</td>
<td>collaborative, divided roles, collaborative</td>
<td>copying continues</td>
</tr>
<tr>
<td>11:29</td>
<td>OR, RE, OR, J, J, OR, OR, I, OR, Q(l), OR, OR, DI, OR, OR, Q(RP), A/OR, DI, RP, DI, RP, DI,</td>
<td>organising working, procedural working</td>
<td>collaborative, collaborative, divided roles</td>
<td>copying text from &quot;nuclear fusion&quot;</td>
</tr>
<tr>
<td>continues...</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>11:45</td>
<td>AF, EV, C, AF, OR, Q(OR), A/F, C, Q(l),</td>
<td>organising working, off-task activity</td>
<td>confusion, silence, divided roles</td>
<td>using &quot;keyword search&quot;</td>
</tr>
<tr>
<td>11:46</td>
<td>A(RE), C, EV, C, OR, J, AF, OR, C, OR, C,</td>
<td>off-task activity, play activity</td>
<td>confusion, silence, divided roles</td>
<td>browsing off-task pages</td>
</tr>
<tr>
<td>11:47</td>
<td>I, EV, I, C,</td>
<td>off-task activity, play activity</td>
<td>confusion, silence, contact with the teacher</td>
<td>browsing off-task pages</td>
</tr>
<tr>
<td>11:47:40 (finish)</td>
<td></td>
<td></td>
<td></td>
<td>finishing working</td>
</tr>
</tbody>
</table>

SUMMARY

Total time = 31:30

Peer discourse is mostly characterized by the organisational (f=175, 29.9%), dictation (f=123, 21.0%), and repeating (f=66, 11.3%) functions. Questioning (f=51, 8.7%) and answering to questions (f=30, 5.1%) as well as affective (f=36, 6.2%) use of language are also common.

The pair's task processing is superficial and product-oriented evidenced by the lack of exploratory discussions about the themes and contents of the poster. The pair's work focuses on copying text literally from the multimedia software. Off-task and playful activity are common especially at the latter part of the session, which testifies low motivation level and orientation during the task-processing. The pair's ability to use the software and computer are above the average.

The social interaction of the pair changes considerably during the task-processing. At the beginning of the task collaboration between the boys is weak characterized by disputatious, domineering, and confusion/silence modes. Social interaction improves gradually into somewhat more collaborative. However, in this situation collaboration refers to a situation during which the execution of the task is divided by the students into two distinct roles. The other child dictates and the other one writes text into the poster. Disputation and confusion increase again towards the end of finishing the task.

The activity of the pair includes to a great extent copying of text from the multimedia software. Occasionally the boys investigate the software by browsing the pages and using alphabetical search for information-seeking. At the end of the working session the scanning of the off-task topics becomes normal. The level of the presentation was assessed as 3/6 including a lot of copied text and few illustrations. However, the outlining of the topics in the presentation was found to be logical and clear.
The distribution of the language functions between the students’ talk is highlighted in Figure 3. The figure shows that there are clear differences between the students in the ways they used their verbal language. Whereas Saku is much more involved in dictating (DI; f=122/1), Jani uses the organisational (OR; f=130/46) function and repeats (RP; f=58/8) spoken language more often. Among others, these patterns in the pupils’ discourse imply that the students adopted distinct working roles in their joint activity. This is also demonstrated in the extract of peer discourse shown further below.

**FIGURE 3.** The distribution of the frequency of the language functions across pupils
The dynamics of Saku’s and Jani’s interactive activity in terms of cognitive and social processing is summarized in Figure 4.

**FIGURE 4. A summary of students’ interactive activity: The case of Saku and Jani**

The data on Saku’s and Jani’s interactive activity show that the students work was rather procedural in nature throughout the task. The pair’s activity focuses to a large extent on reading text from the software, dictating it to the peer who in his turn writes it down. Although the social interaction of the pair can be in some sense characterized as collaborative since the students are jointly working on the same task towards a common goal, the students, nevertheless, seem to have created distinct working roles in the execution of the task. As can be seen from the whole structural map characterizing the working and interaction processes of Saku and Jani, their social interaction is not as collaborative at all stages of their work. Particularly, at the end the boys started to dominate and dispute which often lead to confusion and silent episodes. The playing around activity and affectional use of language also imply the boys have not been deeply involved with the processing of the task.
<table>
<thead>
<tr>
<th>TIME</th>
<th>PARTICIPANTS</th>
<th>TRANSCRIPTED PEER DISCOURSE</th>
<th>DISCOURSE FUNCTIONS</th>
<th>CONTEXT INFORMATION</th>
</tr>
</thead>
</table>
| 11:28 | 1) JAN   | chain... i'll write the whole sentence  
   keilu.. tälle kauze loppuun  | repeats (RP) and  
   organizes (CR) | Jani is writing the  
   text to the poster |
| 11:28 | 2) Saku  | yeah... the chain... no more, this one.  
   shortly nii, reaktion... ei enää ku tälle, ihan pikkusen  | agrees (J), dictates  
   (DI), and organizes (CR) | |
| 11:28 | 3) Jan   | yeah, and then.  
   joo. nii  | agrees (J) and  
   organizes (CR) | |
| 11:28 | 4) Saku  | in which  
   jossa  | dictates (DI) | "yeah" in this  
   context means that  
   Jani has written  
   down the word and  
   wants Saku to  
   dictate more |
| 11:28 | 5) Jan   | yeah  
   nii  | organizes (CR) | |
| 11:28 | 6) Saku  | explore... two words  
   halkeaa... kaaks sannea  | dictates (DI) | |
| 11:28 | 7) Jan   | explore  
   halkeaa  | repeats (RP) | |
| 11:28 | 8) Saku  | other  
   muitahin  | dictates (DI) | |
| 11:28 | 9) Jan   | other  
   muitahin  | repeats (RP) | |
| 11:28 | 10) Saku | atoms full stop... okay the next one  
   atomia piste. nonti sanaeave  | dictates (DI) and  
   organizes (CR) | |
| 11:28 | 11) Jan  | and, full stop  
   ja. piste  | repeats (RP) | |
| 11:28 | 12) Saku | next page  
   next page [sic]  | organizes (CR) | |
| 11:28 | 13) Compu | "nuclear fusion..."  
   "ydnfusio..."  | computer "talk" (C) | |
| 11:28 | 14) Saku  | we were supposed to write about this a little  
   tästikä piti kirjottaa. pikkusen  | organizes (CR) | |
| 11:28 | 15) Jan  | want... where is it # (indistinct)  
   oota. missä se on se #  | organizes (CR) | |
| 11:28 | 16) Saku | #  | informs (I) | whispers to Jani  
   and starts to play  
   playing with the  
   computer |
| 11:28 | 17) Compu | "nuclear fu. nuclear fu. nuclear..."  
   "ydnfu. ydnfu. ydnfu. ydnf."  | computer "talk" (C) | |
| 11:28 | 18) Saku  | okay, let's take this one here  
   nogo... deaan tämäki tästä  | organizes (CR) | |
| 11:28 | 19) Compu | "in the sun..."  
   "auringossa rahohtuu..."  | computer "talk" (C) | |
| 11:28 | 20) Saku | shall we write about this  
   kirjoitettako me tätä  | organizational  
   question (Q) (CR) | |
| 11:28 | 21) Jan  | perhaps a little  
   vois sitten vähän kirjoittaa  | organizational  
   answer A (CR) | |
| 11:28 | 22) Saku | yeah. nuclear physics. nuclear fusion. shall we write about nuclear physics  
   joo. ydnfysika. ydnfusio ja ydnfusio. kirjoitettako me  
   ydnfysikasta  | agrees (J), reads  
   text aloud (RE),  
   makes on  
   organizational  
   question (Q) (CR) | |
   ydnfysika. kyke  | repeats (RP) | writes down the  
   word |
The extract of the students’ verbal interaction demonstrates the procedural activity in which the boys were engaged. As the extract shows, Saku dictates the text from the software to Jani who in his turn repeats the dictated text and then asks Jani to continue dictating. Not much consideration is paid to planning the content of the poster or evaluating and interpreting the information given in the software. Neither do the students seem to use their prior knowledge of the theme in the process of constructing the contents of their poster. The nature of students’ verbal interaction also gives evidence of the distinct working roles the students’ have adapted in their joint activity.

The second example clearly shows that the computer and the software the students were using played an important role in the students’ social interaction. In their interactions the boys often referred to the computer or software by partly constructing their shared understanding through this tool. In the extract, this can be seen from line 14 onwards. In his turn, Saku says "We're supposed to write about this...a little". Jani does not immediately understand what Saku means by this and he asks for Saku’s advice. Saku gives his answer by a non-verbal gesture and then starts to play around thus ending the discussion of the topic. After playing around with the sound of the computer, Saku thinks he’s found something "cool" and says in a louder voice, "Okay..let's take this one here". Again the tools, in this connection the computer and software, play a role in creating a common ground for mutual understanding between the boys.

Discussion

In recent years, the importance of the social and contextual aspects of cognition have been widely recognized (Anderson, Reder, & Simon, 1997; Greeno, 1997). More attention is paid to the practices, processes and conditions leading to the social construction of knowledge and intersubjectivity in classroom interactions across learning environments (Fisher, 1993; Lemke, 1990; Palincsar, 1986; Tuyay, et al., 1995). The focus of analysis is being extended from external factors influencing socio-cognitive activities and learning processes to the students’ participation and evolving interpretations of the learning situation (Grossen, 1994; Lave & Wenger, 1991; Perret-Clermont, et al., 1991; Rogoff, 1990). In the midst of these changes in emphasis, new methodological questions concerning the analysis of classroom interactions have arisen. Questions to which researchers try to find answers are, for example; How to show qualitative difference between interactive activities across learning contexts and arrangements? Upon what criteria should such judgments
be made? and How applicable are the methods used? (Westgate & Hughes, 1997). It is clear that the recent focus has challenged the methodological approaches used to investigate collaborative peer group interactions and learning processes. It is evident that the methodological tools developed should take a more dynamic and process-oriented account of collaborative peer group learning. In addition, they should recognize the role of physical and psychological tools in shaping the nature of collaborative learning activities. On the whole, there is a need for multi-layer analyses which support one another and which enable investigations of the relationship between and within them. On the other hand, reciprocity or social construction of knowledge may not be identified unless attention is paid to the development of classroom interactions on a moment-by-moment basis.

This paper introduces a framework for understanding peer-directed collaborative learning practices in educational contexts. The emergence of the analytic system was affected by a preliminary perception about the diversified role, operation, and meaning of peer interaction in different learning contexts. Also many of the analytical models developed earlier to investigate peer interaction from an educational perspective were found to be inadequate. Firstly, because they have often concentrated only on peer discourse without taking a holistic, multi-dimensional perspective which acknowledges students’ co-verbal and non-verbal behavior. Secondly, the analysis have often been unable to highlight the sequential development of students’ interactive activity and, consequently, have been unable to show the actual process of knowledge construction in peer groups. Thirdly, many of the studies have taken either the individual or a group as their unit of analysis without investigating these units together as a part of a socio-cultural system (Cole, 1996; Cole & Wertsch, 1997).

The empirical examples presented in the present paper demonstrate the potentials of the current system to describe the different patterns of practice in peer-directed interactions. The dynamic nature of peer interaction is acknowledged in the system by focusing on the whole interactive spaces created by the students in their verbal and non-verbal interactions on a moment-by-moment basis. These interactive spaces are viewed from three parallel dimensions concentrating on the functions of peer discourse, and the nature of cognitive and social processing. The different categories identified in the system should not be seen as representing a hierarchy. In the present analysis we do not want to suggest that there are only certain ways of interacting that reflect quality learning taking place. The "quality" interaction con-
ducive to students’ learning must always be defined in context.

The present empirical examples show clearly that students’ discourse functions differently in different learning contexts: in some cases peer discourse operates as an integral part of students’ activity, whereas in some situations discourse tells hardly anything about students’ cognitive or collaborative activity. Therefore, it is claimed not to be enough to draw attention only to verbal behavior if the purpose is to study the complex phenomena of student interactive activity and learning. As the empirical examples show, in order to understand the processes of knowledge construction and patterns of practice in peer interaction, it is important to take into account not only peer discourse but also other interactive actions taken toward a shared understanding in the peer group work situation. Although discourse plays an important role in the process of constructing knowledge, it is not often just talk which works as a mediating tool in students’ joint work. In new learning environments, children often use other tools, such as texts and computers, which they make their situationally shared mediating tools for constructing understanding. As our empirical examples demonstrate, students frequently transform physical tools into shared psychological tools in their evolving interactions. In the mathematics task, the geometrical objects played a significant role in peer interaction. In the science task, the multimedia context created by the computer created a mutual context for communication and reciprocal understanding. The role of verbal interaction seemed to diminish considerably in the latter context since the actual use of the tool played an important role in the students’ interaction. The role of verbal communication in students’ activity seemed also to diminish when the collaborative relationship between peers was more intensive and friendship based.

Modern video technology with real-time information can effectively capture the students' interactive practices in collaborative peer groups, including co-verbal and non-verbal communication and the use of tools. Moreover, the video records can also help the participants themselves recall and interpret their collaborative activities. This gives a triangulated understanding of the phenomenon leading to better understanding of the interactive and collaborative practices taking place in peer groups.

In the present method the parallel data of peer interaction is illustrated with the help of structural maps which have been created for each peer group to describe the sequential evolution of peer interaction processes. The creation of analytical maps helps one to investigate the situation specific evolving peer
interaction in a conceptual framework. Although a structural map is always a simplification, it gives a coherent and temporal picture of a complex situation making comparisons across educational contexts, peer groups and students possible. Moreover, the structural maps help one return easily to the original data to check the validity of interpretation. In addition, when presenting extracts from the data, one is able to investigate the co-text, that is, the data context to which the extract belongs.

One of the problems often faced by ethnographic researchers of learning and interaction is how to make their findings more generalizable. Also, the situative perspective has been criticized for being unable to contribute to the actual teaching practices or educational improvements due to its focus on groups and situated contexts of activity (Anderson, et al, 1997). The present method of analysis could be viewed as an attempt to unite some features from cognitive and situative perspectives to learning. This can be seen, for example, in that the analysis method takes a group and an individual as its units of analysis: Whereas the functional analysis of peer discourse focuses on individuals' participation, the analysis of cognitive and social processing investigates the group as a whole. Furthermore, in order to increase the generalizability and comparability of research findings, it is necessary to create an analytic framework through which the phenomena in question is investigated. The present analytical method focuses on three parallel levels through which students' social activity is investigated. The situated feature of the analysis method comes into play whilst interpreting the ways in which these three analytic levels are realized in different situations.

The analysis method introduced is able to provide both qualitative and quantitative data on peer interaction which can be linked to variables, such as students' interpretations of the learning situation, motivational orientation, age, gender, social background, learning outcomes, or to the effects of certain pedagogical arrangements and learning tasks on students' practices and learning opportunities. The qualitative data enrich the quantitative by highlighting students' situated practices in different situations. The method also offers the possibility to investigate the sequential development of peer interaction and, consequently, is able to demonstrate the evolving processes of participation and knowledge construction in collaborative peer groups.

**Conclusions**

In our methodological approach to peer interaction, we have tried to take a
synchronic as well as a diachronic view: On the one hand, the method concentrates on investigating collaborative peer group interactions at three parallel levels, on the other, the method investigates the processes of peer interaction, characterizing the sequential evolution of collaborative peer group practices across time. Analysis of this nature appears to give valuable information about the patterns of practice during collaborative peer group learning and to highlight the different opportunities these create for student learning. The different levels of analysis support and complement one another by giving a more holistic picture of the complex phenomena of situated peer interaction. The notion of simultaneously looking at the individual and group functioning in a social situation, as well as by taking a dynamic, process-oriented account of situated peer interaction by focusing not merely on discourse but on the whole interactional spaces and their development, seems a promising approach to furthering access to collaborative learning practices in peer-directed small groups. It is hoped that the present descriptive system not only offers one analytical tool to understand peer-directed learning activities but also stimulates new ideas on how to collect, analyze and report data on peer interaction in educational contexts.

Acknowledgment

The research reported in this paper was supported by the Academy of Finland (Project no: 132925).
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Irina Zimnyaya, Tatyana Poutilovskaya

SPEECH DEVELOPMENT REGARDED AS THE FORMATION OF COMMUNICATIVE PROBLEM SOLVING

Intensive research in the field of speech development, which has been carried out since the beginning of the century, resulted in enlarging the knowledge of its general tendencies and obtaining the data which illustrate the function of specific speech mechanisms, peculiarities of oral and written speech, the rules of language formation etc..

The idea of close interconnection between the processes of speech and language development, on the other hand, and communication between people, on the other hand, which was put forward by L. Vygotsky, gave rise to a new approach, that of teaching a language as a means of communication (A. Markova).

Analysing speech development from the point of view of the theory of speech activity (A. Leontjev, I. Zimnaja) made it possible to regard speech development as two-sided process which embraces the progress made in productive (speaking and writing) and receptive (listening-comprehension and reading) types of speech activity.

The combination of the above mentioned approaches leads us to the idea of investigating communicative development as a wide concept, which includes all the speech, language, and communication changes taken together. Thus communicative development is considered to consist in a large number of changes in one’s productive and receptive types of speech activity, the latter being traditionally overlooked and the former being usually focused on.

It is quite obvious that communicative development cannot be regarded separately from all the other processes that take place in the development of personality as a whole, especially those connected with speech and thinking formation. From this point of view, the tendencies which are characteristic of the development of speech, thinking, and other mental functions are applicable to communication development. They will serve as substantial background for
Our investigation. Communicative development is quite specific, its specificity being due to the characteristic features of communication as such. We regard communication as a succession of communicative acts in which there are at least two participants, one functioning as the speaker, and the other functioning as the listener, who exchanges their roles from time to time. Functionally each act of communication is aimed at solving a particular communicative problem (I Zimnyaya). The scope of communicative speech problems used in the process of communication between people is very wide. But some of the problems are known to be most frequently used in communication. All of them are considered to belong to certain groups of problems, that is dividing them into certain groups and choosing one of the problems as a representative of each group which bears the main features of all the other problems belonging to the same group. The psychological character of speech problems, in particular their communicative orientation, and the plan of reality denotation, turned out to be the most appropriate criteria for such a classification. Using the above mentioned criteria, we divided the most frequently used communicative problems into four groups, one problem representing the whole group of similar problems. They are respectively description, argumentation, explanation, and persuasion.

If we regard communication as a succession of separate acts, each aimed at solving this or that speech problem (or task? Ailis remark), we could assume communicative development to be subject to certain changes in the ability to solve the above mentioned problems more or less successfully, and the range of problems used by different age groups representatives.

The experimental data obtained as a result of our investigation of communicative problem solving in different age groups of schoolchildren (9, 12, 15) and adults (students of higher educational institutions) revealed age peculiarities in problem solving, which are mainly of three types. The range of speech problems solved by each group of students constitutes the first group of changes. The range is constantly enlarged by more and more psychologically complicated problems. Thus the tendency "the more senior the student, the wider the range of speech problems to be solved" turned out to be undoubtful.

Another important conclusion obtained in the course of the experiment is that any speech communicative problem used by each age group of schoolchildren in the process of communication is solved successfully if the psycholinguistic character of the problem coincides with the mental abilities of the students,
speech and thinking abilities being of primary importance. In other words children of each age groups are especially sensitive to the solution of a certain problem. It was proved that the above mentioned hierarchy of speech problems (description, explanation, argumentation, persuasion) does not only represent psychologically different groups of problems, but showes a definite tendency in the age development of communication as a specific type of activity. That means that less scomplex problems, such as description e.g. are relevant to the age abilities of junior school schildren. Explanation being more complex speech problem, fully coincides with the abilities of teenagers. Whereas senior schoolchildren are especially good at proving things. The most complex speech problems such as "persuasion" can be fully aquired only by students of higher educational institutions, i.e. adults. In order to fully understand the essence of the principle of sensitivity of each age group of students to the solution os this or that problem, it is necessary to get deeper into the psycholinguistic features of communicative problems. The psycholinguistic character of communicative problems is made up of various groups of features. Some of them refer to the activity of the speaker, in particular the specifity of his thinking, which underlies the process of problem solving, such as a type and character of reality reflection, types of logical connections between the elements of reality reflected in the text, type of thinking activity required from the speaker, the existence of visual support. The remaining features constitute communicative characteristics proper, namely degree of influence exerted on the listener, obligatory or optional presence of the listener, type of his reaction. If we analyse the four types of communicative problems through these positions we wil get the complete psycholnguistic image of each problem.

**Description** as a communicative problem presuposes empirical reflection of reality through explicit temporal links between the events and objects described. It is based on image bearing non-abstract thinking, and requires obligatory visual support. Its influence exerted on the listener is extremely small, actually it is minimum, and even the presence of the listener is quite optional. The response to any "description" is specific, and consists in visualizing the described reality.

**Explanation** is based on theoretical reflection of reality mainly through implicite causal links between the reflected events and objects. It requires theoretical logical thinking activity on the part of the speaker. When one explains something to somebody, visual support is optional. The impact of explanation on the listener is grater in comparison with description, the former being more oriented on
the presence of the listener, as well as his understanding of the things explained. Thus the activity of the listener is more complicated in case the speaker explains something to him.

**Argumentation** as a communicative problem is in some aspects analogous to explanation. As well as the latter it is based on theoretical reflection of reality through implicit causal links between the reflected events and objects and requires theoretical logical thinking activity of the speaker. Argumentation differs from explanation in its impact on the listener, and its orientation on his presence and reaction. When the speaker proves something to the listener, the listener’s activity is still more complicated, and his reaction presupposes both understanding of the speaker’s utterance and his agreement of disagreement to what is said.

**Persuasion** as a communicative problem is also based on theoretical types of reality reflection, and reveals mainly implicit and causal links between the objects and events of reality. Persuasion encourages theoretical thinking of the speaker. It does not necessarily require visual support, but requires the presence of the listener, as well as his verbal reaction, the latter being complex enough. The listener’s reaction to persuasion consists in understanding the speaker’s utterance, agreement or disagreement to what he says, and emotional attitudes to it.

Besides everything mentioned above, communicative problems differ from another **structurally**, i.e. in the logical structure of the speaker’s thought. From this point of view, description is monostructural, explanation logically consists of two parts (explanance and explanandum) and both argumentation and persuasion logically consist of three parts (thesis, basis, and arguments).

There is still another conclusion which can be drawn as a result of the experimental research. It is connected with the **changes in the mode of solving communicative speech problems** that were revealed in different age groups of schoolchildren and adults. It was found out that most speech and language parameters of the texts which resulted from the solution of this or that communicative problem become more and more mature as the children grow into adults. It is essential that it was through the text as the psychological product of speech activity that the process of problem solving was investigated. Taking into account the fact that all the peculiarities of speech and communicative activity are materialized in the text we applied text analysis.
which gave us a wide range of possibilities due to numerous speech and language parameters that had been used earlier, and a number of new parameters introduced in our research. Thus, it was shown that reality reflection becomes more complete, detailed, and correct. Adults (university students) for example, reflect 2.4 times as many reality links as junior schoolchildren do. The predicative structure of the text becomes more complex and diverse, including not only first order predictions but higher order predictions as well. Adults use approximately twice as many predications in the text as junior schoolchildren. This growth is due to the use of higher order predications containing details by elder students. The elder the student, the more details he reflects in the text including implicit, causal and evaluation predictions which usually contain editional information about reality. As for speech and language parameters, they also change substantially. In the first place it is the lexical and grammatical complexity of the text that increases 3.2 times. Then, it is the internal cohesion between the elements of the text that grows 2.1 times. Besides, children’s verbal behavior becomes more logical, argumentative, consistent, conscious, and reflective. Let’s take the communicative problem of argumentation as an example and analyse it from the genetic point of view.

"Argumentation first appears in the verbal behavior of a junior schoolchild, but at this age it is quite elementary, is often limited to showing an object or referring to some visual support, for example, or somebody’s words (P. Blonsky). Our experiment confirmed this fact and revealed some other peculiarities. The scope of this article only allows to dwell on some of them. Junior schoolchildren do not make any difference between describing, explaining and proving things. They not fully realize the complex logical structure of argumentation and fail to find the necessary arguments in order to prove this or that statement. Teenagers turn out to be more successful in their proving activity being able to find out more arguments to prove the given thesis, and doing it more logically than junior schoolchildren. However teenagers mostly rely on their memory rather than thinking activity when they try to prove something. P. Blonski pointed out the most typical way of proving things used by teenagers, and called it "reductio ad absurdum", emphasizing the fact that argumentation of teenagers is immature. Besides, they do not fully realize the difference between the problems, especially those which are psychologically very close to each other i.e. argumentation and persuasion.

Senior schoolchildren are highly sensitive to argumentation as a communicative problem, mainly because the psycholinguistic features of this problem are
relevant to the age speech and thinking abilities of senior schoolschildren, their texts being more argumentative, logical and critical. But even senior schoolchildren sometimes fail to find enough arguments to prove this or that statement, and often use retelling instead of argumentation. Most changes that take place in the development of argumentation as a teenager grows into senior teenager are qualitative rather than quantitative. Moreover some quantitative parameters, such as the number of causal words and causal predications per text, even decrease. That is why the progress in the formation of argumentative abilities of senior schoolchildren is not always obvious and straightforward. These data show that though being most sensitive to argumentation in comparison with other communicative problems, senior schoolchildren are not always effective enough in their verbal behavior to make the listener agree to what they say. In order to acquire the most effective mode of problem solving this and all the other problems, it is necessary to be especially trained to do that. This practical conclusion is very important for teaching purposes, and is true for all communicative problems and all age groups of students.

Summarizing the results of our theoretical and experimental work we came to the conclusion that all psychological peculiarities discussed above could be put together in one concept, that of communicative age of the person. It is characterized by the scope of communicative problems to be solved at a definite age period, and the peculiarities of the problem solving mode. This concept is to come to some extent derivative of the concept of "speech age" introduced by A. Markova, which is closely connected with the formation of various speech functions at different age levels. From our point of view, "communicative age" could be regarded as a wider concept because it involves all speech, thinking, and communicative abilities of a person of this age, which are materialized in communicative problem solving. Therefore it embraces all genetic changes that a person undergoes as he gets older, and can be indicative of the level of his speech, thinking, and communicative abilities.
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Nikolai Veresov

SOME CONSIDERATIONS ON SENSEFUL LEARNING AND THE DEVELOPMENT OF SPEECH

In this paper I present some theoretical outcomes concerning concept formation which resulted from the “We are earthlings” project of experimental education conducted in Russia and Latvia during 1991-1996. The “We are earthlings” curriculum was an educational programme created for children aged 5-7 years in order to investigate psychological aspects and conditions of the development of structures of ecological consciousness and mental abilities. Here I discuss some theoretical and practical aspects relating to this problem, which can be seen in a third way as compared with the traditional approaches presented in works of J. Piaget and L. Vygotsky which dominate modern psychology. In this paper I shall also try to show the principal limits of validity of traditional Vygotskian and Piagetian conceptions as well as their epistemological similarity. The main stages of the formation of humanitarian concepts in learning are also presented.

1. Theoretical points of departure

Many researchers pay attention to one specific aspect of children’s play, which may be defined as a creation of sense. “The divergence between the visual field and the field of the personal sense is a distinguishing feature of preschool children. The child’s actions are determined not by object, but by its sense…” (El’konin, 1989, p. 489.) Therefore, in play there is not only an assimilation of meanings, but a creation of sense. Play for the child therefore is a sort of senseful activity that is connected with the intensive process of the development of speech. Speech develops within the field of sense which the child creates while playing.

In a situation of formal learning (at school) the overall picture is essentially different. The tasks and school subjects usually do not include “the field of personal sense” because they mean nothing for the child personally. On the other hand, children accept the given tasks in such a way that they find some personal sense.

Teacher: Suppose you have two apples. Then you give one apple to someone. How many apples you will have?
Child: Two apples.
Teacher: How come?
Child: I never give my apples to anyone.

The traditional interpretation of such kinds of situations is that the child does not understand the task, having no scientific concepts formed (Vygotsky) or being unable to think on the level of formal operations (Piaget). But clearly what we have here is a situation where the child's mental actions are determined not by object, but by its sense.

We can presuppose that there is a certain line in speech development which can be defined as a "sense field" and which remains "hidden" in situations of formal learning. The divergence between the visual field and the field of personal sense in play as a distinguishing feature of the pre-school child becomes the divergence between meaning and the field of personal sense in a situation of formal learning.

The problem of relationship and subordination between these two fields – the field of meaning and the field of personal sense – and their role in speech development provides the focus for this article.

**2. Changing direction: From intellectualisation to human learning**

**2. 1. The formation of concepts and intellectualisation of learning**

We have two classical approaches to the problem of the formation of concepts in the process of learning and the development of speech as presented by J. Piaget and L. Vygotsky. According to Piaget there are two main stages in the intellectual development of a child corresponding to two types (levels) of mental operations - concrete operations and formal operations. On the contrary, L. Vygotsky introduced the idea of two types of concepts (so-called everyday concepts and abstract or theoretical concepts) related to two "lines" of development - the natural line and the cultural one. The point of Vygotsky’s criticism of the ideas of Piaget was that the cultural line of development must gradually replace the natural one (Vygotsky, 1986). Moreover, instruction must produce a zone of proximal development for the child opening and creating the cultural line of development as such. However, in spite of the principal difference between these two approaches, which still constitutes one of the most important points of discussion in modern literature (Tryphon & Voneche, 1996), there are sufficient grounds for the assertion that these theories are
not mutually exclusive. Furthermore, careful analysis shows that in a certain sense they have the same epistemological basis. This basis can be defined as that of *intellectualisation*: the picture of development as a whole is limited by its intellectual aspects and consequently the child’s mental development (and associated concept formation) is presented as the development of certain *intellectual* structures only. Therefore, *intellectualisation* can be defined as the epistemological basis, which reduces the development of consciousness and personality to the development of intellectual structures. In the case of J. Piaget, the development of consciousness was reduced to the development of a system of mental operations, whereas according to L. Vygotsky it became the development of concepts ranging from everyday matters to theoretical ones. This shows that intellectualisation can be seen as a common epistemological basis of the conceptions of thought development in theories of both Piaget and Vygotsky in spite of the differences existing between them. In fact, such an intellectualisation play a very strong explanatory role in theoretical descriptions of thought and speech development in childhood. Both operations and concepts are necessary aspects of thinking: but the point is that thinking itself must not be reduced to these aspects or even to combinations of them. Let us now have a look how thinking, mental operations and concepts are connected.

2.2. Operations, concepts and thinking

Thinking as a psychological process is a system of mental operations involving concepts. Therefore, to be able to think the individual must have formed a system of operations together with concepts to operate with. According to Piaget the level of thinking depends upon the system of mental operations (Piaget, 1978). On the contrary, in Vygotsky’s approach, the level of thinking ability depends exclusively on the formation of concepts (Vygotsky, 1981). Our experimental results show that the difficulties and troubles children encounter during learning are connected with the fact that some children are able to operate with concepts abstractly but have no concepts formed. As a result this ability gradually disappears with time. On the other hand, there are children who have abstract concepts formed, but they are not able to operate with them mentally. This leads to the disappearing of the concepts from the mind and a gradual replacement of them by everyday (natural-empirical) concepts. In both cases the development of thinking abilities is hardly enhanced. Thus the children possess either an uncertain fragmentary fusion or their minds are characterised by a mixture of concrete operations, abstract concepts, empirical concepts and formal operations (Veresov, 1993; 1997).
From this it follows that even the intellectual development of a child within a process of learning cannot be supplied simply through the development of formal operations (Piaget) or the formation of theoretical abstract concepts (Vygotsky). Consequently, the development of thought cannot in principle be reduced to the process of the formation of formal operations or to the formation of concepts. They both are necessary. This point of their mutual importance brings the possibility of a new vision of the development of thought. On the other hand, we have enough grounds for the assertion that to be successful the process of concept formation must necessarily include two main phases:
- a specially organised process involving the formation of a system of mental operations;
- the formation of concepts.

Although necessary, the phases mentioned above do not “cover” all the process of the development of thinking. The analysis of experimental data shows that even in a specially organised formation of concepts and abstract operations the results are not satisfactory: only some children from the group (no more than 25%) demonstrated that they were really able to use abstract concepts. This circumstance leads to the assertion of the existence of undefined factors influencing the process of concept formation, factors that are absent from the conceptions of Piaget and Vygotsky and which were therefore not taken into account.

From my point of view these factors are strictly connected with the functions of words and with types of scientific concepts.

3. Types of concepts and functions of words

3.1. Looking from the cultural perspective

Let us start with the proposition that we must distinguish two types of science: natural and humanitarian. In fact, both Piaget and Vygotsky in their theoretical conceptions dealt with concepts of natural sciences such as mathematics and physics. However, humanitarian sciences (and ecology as a science of the human home is one of these sciences) also possess systems of concepts, which differ from those of natural sciences. What does this mean in practice?
3.1.1. Forms of natural and humanitarian concepts

The first and obvious difference between these types of concepts is that they take different forms. The concepts of natural sciences are expressed mostly in graphical symbols and formulae (for example numbers and figures in mathematics and single letter symbols such as V [velocity] in physics). By contrast to this, the concepts of humanitarian sciences exist in the form of words. Of course, some concepts of natural sciences can also be presented in word form (for example, the word ‘quantum’ in physics) and some concepts of humanitarian sciences can be presented in symbolic form (fable [F] in literary criticism). However, what is important here is that they are different not only in their form, but also in their contents and meanings.

3.1.2. Content of natural and humanitarian concepts

In contrast to the notions and concepts of natural sciences, humanitarian concepts also contain personal and human “dimensions”. Representing the values of human culture, they include the personal attitude and position of the individual. For example, force or velocity in physics reflects the characteristics of objects and the relations between material bodies in space and time. These notions do not demand any personal evaluation; they do not require any attitude from the individual. It does not matter whether I like the velocity of an electron or not. On the contrary, all the notions and concepts of the humanitarian sciences require personal attitudes to be assumed. Mother is a biological object, one of many others, but MOTHER is one of the most important symbols and values of human culture. A house is one thing from the point of view of physics (building, construction), but it is, at the same time, quite another thing from the point of view of architecture or ecology (HOME).

*Concepts of humanitarian sciences reflect not only relations between objects, but also the cultural attitude of mankind towards objects in terms of human values.* They express personal positions and cultural values and demand a personal attitude. Moreover, they reflect a system of human relations which is wider that the experience of any single individual. In opening their content and opening this system of human values and attitudes the child is opening his consciousness because consciousness “lives” in this system. In accessing the concepts of human sciences with their implicit systems of human values, the child joins himself to such systems and makes these values his own. Thus we can speak of human learning and human education. We can speak of a development of personality which is not limited by the development of speech.
and thinking.

In “Psychology of Art” Vygotsky introduced the idea of the psychological structure of an artistic text as a component of the socio-cultural environment. He believed that in art, and in an artistic text in particular, the texture of aesthetic objects is itself imbued with psychological elements and that an artistic, cultural phenomenon has its own psychological structure, independent of the reader or the spectator.

What is the psychological structure of the text? According to Vygotsky, an artistic text exists at two levels (lines). The first and more obvious of the two is its plot. The second is its cultural sense, the hidden line of content. This hidden line is in a certain sense a Russian analogy to the English “moral lesson” (Vygotsky, 1987, p. 121).

This must be taken into account in the process of formation of humanitarian concepts. We have to open up children’s cultural sense and we have to enrich the word which opens up to the child with a cultural content that is wider that his or her own individual experience. This leads to the conclusion that this enrichment has to be taken as an independent and important stage in the formation of concepts in learning. However, it is of great importance to realise how the child himself sees this process. This also means that the content of learning must be cultural. Thus the logic within the structure of the curriculum is the same as the logic of cultural phenomena. It must consist of “two levels”; the level of knowledge (level of meanings) and the level of cultural sense. This requirement is important from a psychological point of view: the cultural sense must be opened up both to the child and by the child, before he starts to create his own system of meaningful new relations towards the world. Therefore learning matter cannot be simply given to the child - it must be built, constructed, created by the child himself (with the help of the teacher). In this way the child becomes able to express his own sense.

3. 2. Looking from the perspective of the child

When we play piano we do not simply press the keyboard mechanically. We use notes (signs with proper meanings) and we express our feelings while playing. This means that signification and expression can be defined as important components of playing which cannot be reduced to a the system of technical operations with the instrument involved. We can say the same about the functions of words. A word has three functions:
The word generalises, and here there is no principal difference between the concepts of natural sciences and those of humanitarian sciences. But what is important is that the word signifies objects and expresses a personal individual attitude towards the world. Herein lies the difference between these two types of concepts as already mentioned above.

Speaking of a child’s perception of concepts we should take into account at least two important points connected with the functions of words. The first of these is that the child very often does not perceive the word as a generalised abstraction. The following example illustrates this point. In Russian schools there is a five-grade system of marks where the mark “four” means “good” and the mark “two” is “bad”. A six year old boy asks his teacher:- If 2+2 is 4 as you told us, can you change the two “twos” you have given to me into a “four”? It is the same for you but not for my mother… So, the number “4” as a mathematical abstraction does not require any personal attitude. The mark “4” is something different and includes personal a “dimension”, being a mark of social relations between teacher and child. The child in this case accepts the significative function of the word rather than the word as generalisation. For children words are mostly “names” of objects, properties and actions and the child cannot separate the word (name) from the object - very often there are not two “realities” but one.

In Piaget’s and Vygotsky’s theories the concept itself is presented as a mental result of generalisation expressed in a word; accordingly this brings difficulties to the child and leads to a “mental fusion” of the functions of the word. Thus the child is not able to use the word as an instrument of generalisation or signification, a result which destroys any attempt at concept formation. From this we may draw at least one conclusion of principal importance. We have to separate the word from the subjects in the child’s mind before concept formation can begin.

4. Stages of concept formation

In the experimental education project involving the “We are earthlings” curriculum (Veresov, 1997) we applied the discussed stages of the formation of concepts.
Theoretical and experimental analysis show that the above mentioned stages in the formation of concepts relating to the human sciences are important and necessary. They constitute the step-by-step technique we used in implementing the “We are earthlings” curriculum. Analysing these stages I will give an example of how in our experimental work with 5-6 year old children we developed the concept of HOME, which is a basic and general concept of ecology. The point here is that, unlike English (Home and House) and Finnish (Koti and Talo), the Russian language uses a single word DOM to express both meanings.

4. 1. Introduction of the sign to the child (first as an element of graphical models)

Initial introduction of the graphical sign occurs in one of the first lessons. In answer to the question “Where does the man live?” the child, with the help of the teacher, pictorially designates the link between the person and his house (Home) by the use of an arrow. This sign (arrow) describes the link of the person to his home and has a verbal meaning. In other words, it can be read as a word “lives”. Accordingly the whole picture can be read as “The man lives in a home”. However, it is important to mention that for the child this is no more than a riddle, a picture or even a game. At the same time, however, this picture is a graphical model containing a sign. Moving his finger across the picture the child can formulate the answer. The next step therefore becomes possible when the child knows how to “read” the arrow.

4. 2. Special procedure for distinguishing the word as a special type of sign derived from objects

An arrow is a sign with a certain meaning, likewise a word. Therefore, a word can be opened up to the child as a special type of sign which signifies a given object. It is the “name” of that object but is not the same as the object. To illustrate this we use the Russian word ZEMLIA which has three meanings; Earth, land and homeland. First the teacher asks what ZEMLIA means and presents these three meanings of the word. The answers are drawn with the help of arrows. In this case the sign (arrow) means “means”: Zemlia means the Earth, then the land (ground) and finally, the homeland. Then the children ask the teacher what ZEMLIA is and the teacher replies that ZEMLIA is just a word. Finally they come to understand that ZEMLIA is a word which designates (signifies) these three objects. The important conclusion to be drawn is that the child is able to distinguish a word (sign) from an object and that this
object is something that exists separately from its “name”. This makes the next step possible: the psychological conditions now allow operation with words as signs independent of their concrete meanings. And the next step is the formation of the generalised initial concept of HOME.

4. 3. Formation of the initial concept on the basis of generalisation (mental operation)

The previous stages create all the necessary conditions for the formation of the concept of Home, which is the most abstract and primary concept in ecology. The lesson in which the creation of the concept of Home as the main and basic ecological concept occurs is organised in the form of a journey in a time machine. During this journey the children investigate various types of human dwellings from primitive caves and caverns up to modern buildings. Investigating and analysing common and various features of human dwellings the children come to conclusion that HOME is the place where human beings live. In outward appearance the dwellings differ greatly from each other. Not all of them have windows, roofs or doors (which might be considered the main distinctive tags of a modern home). It is the person living in house (dwelling) that makes it a Home.

Home is the place we live in and no other distinctive tags are needed. So, here the abstract concept gradually replaces the everyday empirical representations what Home is. As Home is the place we live in so we can call our city, village, our country, continent or even the Earth itself our common Home - a Home without walls. It should be stressed that in this case the word Home as a concept generalises some basic fundamental and essential features of the object, but does not describe the house as such. Thus the child is able to use a familiar word in a new sense i.e. as concept. But Home is also one of the basic values of human culture. This cultural content must be also revealed.

4. 4. Enrichment of the initial concept through humanitarian content (the use of concepts as instruments of expression of a personal attitude towards the world)

The humanitarian content of a concept (eg the human attitude to Home as a spiritual value) is revealed in the analysis of the well-known fairy tale “Three little pigs”. The opening of the “semantic space” of the fairy tale, which is of greater significance than the plot of the adventures of the pigs and the wolf, requires a specially constructed dialogue. Here is a fragment of this dialogue:
- How many participants were there in the fairy tale? (Not four but seven if we include the three houses made by pigs)
- Which house was the pigs' real Home? (The last one made from stones).
- Why? (It protected the pigs from the wolf, made them friends and helped them).
- What is a true Home? (Home is the place where we live in peace, love and harmony).

The fragment presented above demonstrates one way of opening the cultural meaning of a tale where human values are expressed. This type of dialogue, which may be defined as “sense-oriented”, together with the previous stages, constitutes the overall method of the formation of human concepts. Home is, of course, the place where we live. But Home really means the place we live in, love, and enjoy friendship, peace and harmony.

Summarising our approach to the problem of developing speech and thinking in learning and instruction one important aspect should be pointed out. In transforming the learning matter so as to include the level of cultural sense we not only render the learning senseful but create the psychological conditions for the development of speech. The divergence between the visual field and the field of personal sense which constitutes the basis of speech development in play becomes the divergence between the field of meanings and the field of cultural sense within the process of learning.

Quantitative and qualitative analysis of the results of the experimental education of children aged 5-7 years using the “We are earthlings” curriculum indicates that this method ensures the process of concept formation and therefore the development of speech. I believe that it opens up new perspectives not only for the development of intellectual structures but also for the development of personality, which is, presumably, the aim of all human learning.
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Kaisa Tolonen

THE CONCEPT OF SHARED ATTENTION AND ITS DEVELOPMENT DURING THE PRE-LANGUAGE STAGE

The phenomenon of shared attention plays a central role in the assimilation of language in young infants. The term shared attention is understood to mean a situation in which the infant interacts with an adult, the two sharing a common attention through the aid of some external object or event. This leads to awareness of having shared a common experience. Various forms of expression of shared experience during the pre-language stage include following the other's gaze, pointing, social gesturing, imitation and use of language as a means of directing attention. These forms of expression begin to appear in the behaviour of infants towards the end of the first year and become more intentional in character during the second year. Turn taking also plays a part within the shared attention phenomenon and turn taking games create a favourable environment for the development of the various forms of expression of shared attention. From the age of about eighteen months the infant has an awareness of shared attention. At the same time he is able to make use of turn taking and the motives for imitation begin to find expression in active speech. Non-linguistic communication diminishes, the range of language-based expressions broadens and the infant's vocabulary begins to grow significantly. At the same time the infant is able to direct himself to experiences commonly shared with an adult.

1. Introduction

With transnational contact ever growing the roles of language and communication as forms of interaction between people are of increasingly central importance. At the same time large differences in infants’ linguistic development already become apparent during the first twelve months of life. Furthermore, language dysfunctions are becoming more widespread.

The assimilation and early development of language have been the subjects of numerous studies by researchers working in the fields of linguistics and psychology. However, the decisive role of the pre-language stage in the subsequent development of language has received less attention. In the practical nurturing of infants a great deal of significance has been attached to the first words which the infant utters. However, the opportunities offered by the all-important preceding stage for the furtherance of the infant’s later linguistic development have not been sufficiently seized upon. What is required, there-
fore, is an analysis of the language assimilation process. We need to find out what are the preconditions for language assimilation present during the earliest stages of infancy. From this we can identify methods which could be used by those involved in nurturing to support early language development at a stage when the infant has not yet begun to speak.

The emerging shoots of language are nurtured through early interaction and through those practical experiences which are presented to the child. The phenomenon of shared attention is one in which many researchers are showing interest at the present moment. Its significance with respect to learning and to language development has been proven in numerous studies (for example, Bruner 1983, Baldwin 1995). Researchers use a variety of terms to characterise the phenomenon and emphasize different aspects when defining it. However, all are unanimously of the opinion that shared attention signifies an awareness that attention directed towards some external object is common and shared. At the same time both parties understand the mutual significance of the shared experience (for example, Baldwin 1995). In the following article the concept of shared attention will be analysed: to which other concepts is it related, how is it seen to develop and which forms of expression it assumes during the pre-language stage. At the same time light will be shed on its significance and use as a supporting element within the early stages of the language assimilation process.

2. Definition of the concept and related concepts

The concept of shared attention brings together the separate notions of intentionality, intersubjectivity and protodeclarativity.

According to Fry (1991) intentionality refers to those concrete goals, intentions and means by which people direct their behaviour. Infants first begin to understand intentionality in respect of their own behaviour. By about eight months the infant begins to differentiate his behaviour in relation to people and other objects. Various goals and means begin to develop as a result of these points of departure. Human interaction forms the heart of the infant’s attention. He begins to apply various means, gestures and noises, and notices that these only produce effects in people. So the social world opens out in a new way for him.

According to Goldbart (1988) adults have been shown to become increasingly selective in their approval of significance within the context of interaction with
infants. Thus the role of the environment is decisive in the selection and interpretation of only certain specific actions and gestures as being of significance. It follows from this development process that the environment recognises only increasingly clearly defined models of behaviour as being of communicative value. This sets requirements for intentional communication which forms the basis of the development of shared attention. In intentional communication meaningful messages are sent to the other person in situations when the message sender is able to influence the recipient’s behaviour through specific activity and sounds. The essential factor here is that the message sender be conscious of the effects of his behaviour upon the recipient. External signs of this process includes exchange of gaze, use of gestures and indications, timing and repetition (Bates 1979, Bretherton 1991).

According to Tomasello (1995) a dramatic change occurs in the infant’s understanding of other people during the second year of life. The infant learns to understand 1. that other people have their own intentions, 2. that these intentions are different from his own intentions and 3. that other people’s intentions don’t always correspond to the real situation. The infant practises his skills with adults, for example, in ‘early conversations’ or in turn-taking games. The central elements of these activities are the use of the voice, mutual gazing and facial expressions. According to Poulin, Dubaisin and Shultzin (1988) the framework of interaction thus described contains mutual intentions and a ‘meeting of minds’ between infant and adult. According to research only by the age of about eighteen months are the preconditions in place to allow the infant to understand other people’s social behaviour.

Intersubjectivity, or intersubjective awareness, describes the infant’s ability to understand other people. Trevarthen (Trevarthen & Hubley 1978, Trevarthen 1979) makes a distinction between primary and secondary intersubjectivity.

Primary intersubjectivity describes the emotional character of the early contact between adult and infant. It relates to those early forms of behaviour which later support the development of intentional communication (for example, early forms of turn-taking and imitation as well as early conversation). These forms of behaviour develop the infant’s ability to share his experiences with a second person in an increasingly complex manner. However, a whole new phase of this development begins at about nine months.

Secondary intersubjectivity refers to interaction in which both parties intentionally exchange messages about the same subject. In this the infant is, of
course, the less skilled. By nine months, according to Bretherton (1991), an infant is able to maintain and reinforce attention towards a common object with the help, for example, of gestures. He understands gestures made by the adult and is able to produce gestures himself. Communicative gestures help to direct the other person’s attention to the area of mutual interest. Of particular interest are gestures relating to the correction of messages as well as those concerned with the receiving and directing of attention. These are early signs of the ability to understand another person’s state of being. From the point of view of secondary intersubjectivity the significant change which occurs at nine months is that the infant becomes able to coordinate person-object relationships and to offer and give objects.

In situations which can be described as a meeting of minds the twelve month old infant implicitly operates (Bretherton 1991) in accordance with the same rules of grammar observed and used by a three year old child. The only difference is that the 12 month old is unable to handle these rules linguistically. Baldwin (1995) emphasises the link between awareness of intersubjectivity and shared attention. The essence of shared attention is the recognition that attention directed towards some external object is shared with a second person. It is precisely this intersubjective awareness of simultaneous participation which lends it value. The appearance of this awareness in the infant’s behaviour leads to a qualitative change in the nature of interaction.

Protodeclarativity relates to the development of the infant’s communication through use of gestures. According to Bates (1979) a developmental change in the infant’s use of gestures occurs when, having proceeded to the intentional communication stage, he begins to show an interest in various types of objects, including those beyond his reach. From this pursuit develops two functions: the protoimperative and the protodeclarative.

From observations of monkeys raised in zoos Comez, Sarria and Tamarit (1996) have shown that, when given appropriate instructions and guidance, the monkeys were able to interact with humans. Their behaviour, nevertheless, is dominated by spontaneous gestures and is thus instrumental in character. The purpose of these gestures is to arouse in the other party specific behaviour in a purely physical sense. These gestures are typical contact gestures and are protoimperative by nature. It is a question of directing the behaviour of the second party.
Protodeclarative gestures, on the other hand, are peculiar to human infants and are founded on a complex cognitive understanding. The goal of such gestures is to share interaction or experience with another person (Bates 1979). The infant directs the adult’s attention to objects by, for example, pointing or using his voice. In this manner he demonstrates his desire to interact with the other person.

According to Comez et al. (1996) protodeclarative gestures are early manifestations of the infant’s ability to enter into a meeting of minds with the other person. They are also a sign of the infant’s ability to form metarepresentations. What is the infant’s goal when he shows or indicates an object to an adult in this protodeclarative manner? It is either an emotional or intellectual experience. The infant is interested in the adult’s reaction, which may be a smile, a spoken response or a look of puzzlement. Thus, attention and emotional reactions are in themselves the goals of the infant’s communicative act. The goal is to direct the adult’s attention towards a given object, to follow her reactions as attention is directed from one object to another and to engage in emotional exchange with the adult. For example, while in a park the infant notices a fountain. He looks at the fountain. After a moment he points to it and, smiling and laughing, looks at the adult - the adult looks, speaks, smiles - the infant looks at both fountain and adult and then his attention his captured by another object. In this example, Comez stresses, it is important to notice that in the process of directing the other’s attention emotions become goals in themselves.

According to Moore and Corkum (1994) two matters become evident in the use of protodeclarative gestures. The infant understands 1. that the other person can direct his own attention towards an object and 2. that he and the other person are potentially equivalent in their ability to participate in such intentional relationships.

From the foregoing points of departure we may define shared attention as follows:

Shared attention is a socio-cognitive phenomenon in which two people consciously share some common thing. In interactive situations involving an adult and an infant shared attention involves the coordination of the two parties’ attention through the use of some external object or event. Of essential importance is the awareness of having had a shared experience. The observable signs of this phenomenon in infants of under eighteen months include,
for example, pointing, showing and indicating, as well as demonstrating an
ability to follow the direction of the other person’s gaze. The early skills em-
bodyed within shared attention take the form of symbolic cognitive skills. But
within the context of shared attention the infant also is receptive to the other
person’s affective signals and relates them to his own representations of feel-
ings. The skills involved in shared attention are behavioural reflexes arising
from the process of intellectual and emotional interaction. They serve to influ-
ence the infant in his early steps towards understanding within the context of
a meeting of minds.

According to Bruner (1995) the significance of shared attention lies
particularly in its use of linguistic communication: it forms at the same time
both the basis of and precondition for the use of language. It enables inter-
course between people and creates a basis for dealing with the demands of
everyday life. At its deepest level it forms the foundation of all human culture.
As far as the young infant is concerned, however, its most important function
is to develop and support his use of language. During the pre-language
stage shared attention embraces a number of phenomena, such as
gazing, pointing, social reference, mimicry and use of the voice as a means of
directing attention. The specific features of these manifestations together with
their development are dealt with in the following section.

3. Nature and development of the manifestations of shared attention

3.1. Gaze

From the time of his birth onwards the infant naturally orientates himself to-
wards the face of another person, in particular to the eye area. Eye contact
prompts the infant into activity and enables the development of communica-
tion between the infant and adult. It also makes possible qualitative changes
in this communication.

The phenomenon of gazing forms an integral part in the development of shared
attention. For example, when the infant wishes to communicate by pointing or
to direct the other person’s attention by using his voice, his following of the
other’s gaze or an exchange of glances indicate whether or not he is experi-
encing shared attention. However, care must be taken - the act of looking per
se does not constitute shared attention. According to Tomasello (1995) there
are at least two types of interaction between adult and infant which cannot be
yet described in terms of shared attention: 1. Both adult and infant look at the
same object independently of one another. Here there is no common atten-
tion. An example of this might be a situation where one is doing something
while the other watches on. 2. Exchange of gaze (alternation of attention be-
tween object and other person) cannot be understood as shared in instances
where one participant does not show an interest in the other party’s attention
towards a given object.

Following the other person’s gaze involves the infant observing the adult turn-
ing her head and, in turn, turns himself to look in the same direction. Accord-
ing to Corkum and Moore (1995) this phenomenon appears when the infant
has reached six months of age and it continues to develop until the age of
eighteen months. We are thus dealing with a developing ability to follow the
direction of a second person’s gaze. Many developmental changes are in-
volved here concerning the accuracy with which the object of the other person’s
gaze is located, behaviour aimed at orientation of the other person’s attention
and the reaction of the other party towards this behaviour. Up until eighteen
months the infant always simultaneously orientates both his head and eyes
when following another person’s gaze. After this stage he uses solely eye
orientation. This is one index of shared attention.

Before the age of nine months, according to Tomasella (1995), the infant is
limited to occasional spontaneous exchanges of gaze. The earliest attempts
at systematic exchanging of gaze appear at about twelve months. The infant
now follows the adult’s attention and tries to direct it. This relates to ongoing
social interaction and presents itself, for example, in how the infant follows the
adult’s gaze towards an external object and then immediately looks back
(that is, checks the adult’s focus of attention), at the same time spontaneously
alternating his attention between the adult and the object. Of especial signifi-
cance here are the quality of gaze, timing and feelings. The infant doesn’t
look at the other person (his mother) in the same manner as he looks at the
object: he expresses emotions when looking at the adult even when the adult
is looking at the object.

Turn-taking games played by mother and infant (such as ‘hide and seek’ and
‘give and take’) reinforce both head and eye orientation as well as the ex-
change of gaze. In particular, the use of objects in play between infant and
adult helps the infant to develop his attention. The mother herself also directs
the infant’s attention to the process of activity itself by alternately turning her
head first to the object and then back to the infant. In this the adult not only
chooses the visual object of attention but, in the early stages, also directs the
infant’s reactions.

3.2. Pointing

Pointing has been studied from two separate points of view (Corkum and Moore): firstly, as a sign of the orientation of the other person’s attention (the infant follows the direction in which the other is pointing) and secondly, as a means of directing the other’s attention (the infant himself produces directive gestures). Research indicates that the infant begins to follow the other person’s pointing from the age of about nine to ten months. By fourteen to fifteen months he is able to follow the direction of pointing to more distant objects. By the end of the first year he is himself able to produce pointing gestures. At this stage pointing is not yet accompanied by use of gaze. By fifteen months, however, over fifty percent of infants are able to produce communicative pointing gestures.

Links between pointing and the development of language have been investigated from the standpoints of both the understanding and the demonstration of pointing (for example, Desrochers, Morisette & Ricard 1995). Infants who have been involved in communicative pointing for a relatively long period of time have been shown to possess significantly improved abilities in both the production and understanding of language. No corresponding link has been found between non-communicative pointing and the ability to use language. Others (for example, Bates 1979) have reached similar conclusions.

The directive or pointing gesture develops by stages. Desrochers et al. conducted longitudinal studies of the stage by stage development of pointing and gaze in infants aged from six to eighteen months. They distinguished between three separate levels of pointing: 1. pointing without associated gaze, 2. pointing first, followed after an interval of about a second by gazing, 3. first gazing, followed a second later by pointing or simultaneous gazing and pointing. The researchers believe that these levels reflect the infant’s ability to understand the relationship between the other person and the object. According to findings, the pointing gesture appears at about twelve months and all three above mentioned levels appear simultaneously. During the second year infants showed a particularly increased ability to gaze first and then point. Thus, the quality of pointing changes and is related to the infant’s growing ability to check that the other person’s attention is focused on the object towards which the infant is pointing. This is also a sign of the infant’s intentional relations which themselves develop in an individual manner through experience. As a
result of this the pointing gesture has different meanings for infants of twelve and eighteen months respectively: one year olds have a need to gain attention - the relationship is of a physical nature. On the other hand eighteen month old infants possess representational skills - the relationship is thus mental in character.

3.3 Social reference

Social reference occurs when the infant turns to the adult in the context of some new and strange situation. Here the infant looks at his mother and uses her behaviour as a guide as to how he should relate to the situation. Social reference begins to emerge at the end of the first year. In some cases the infant may be seeking security. However, the essence of the situation is the search for emotional information as to how to regard the new situation. According to Moore and Corkum (1994), social reference is shows a similarity to phenomena in which the infant registers the direction of his mother’s gaze. But in this case the infant is searching for local information concerning appropriate behaviour. Social reference requires that the infant understands his mother’s psychological orientation in respect of the object in question. The mother’s emotional reaction to the object is linked via the infant’s own emotional orientation.

Baldwin (1995) warns against wrongly interpreting social reference as necessarily constituting a sign of a search for emotional information. He contends that a gaze directed towards a parent’s face might simply reflect a wish to share emotional experience with the parent rather than to gain affective information in situations of uncertainty. Furthermore, a spontaneous glance or gaze may in reality be a more simple non-intersubjective form of behaviour. The infant simply looks whilst feeling threatened. At the same time it has been shown that the degree of social reference bears an inverse relationship to the proximity of the mother: thus the further away the mother is so the behaviour in question becomes more common. When relatively far from his mother the infant may simply be searching for comfort. Alternatively, the infant may be susceptible to his parent’s emotional state without understanding the nature of these feelings.

What, therefore, decides whether or not we are dealing with genuine social reference? It is specificity, or, in other words, does the infant connect the adult’s emotional signals to a specific external object. Infants aged twelve to eighteen months have the ability to do this. This has been shown by studies
(for example, Tomasello 1995) in which the parent indicated positive or negative feelings in connection with various toys, with which the infant later was allowed to play. The parent’s emotions were influential only in respect of those toys with which she had played. This is an indication that the infant had registered a link between the adult’s display of emotion and a specific object. He preserves this link as a guide when he himself is actively involved with the object in question. According to Tomasello, it is probable in this kind of situation that the infant understands his mother to be intentionally involved and perceives her liking or disliking for the various objects in question. In addition, her involvement is perceived as being distinct from the infant’s own, as yet unformed, manner of relating to the toy.

3.4 Imitation

Imitation affects many areas of the infant’s development. This is an indication of its importance as a forward carrying force in the development process. Imitation is believed to contribute significantly to the learning process, especially in the assimilation of language. On the other hand, imitation is connected with the command of social interaction, in particular, in the mutual reconciliation of the two parties’ behaviour and as a way of participating interactively with the other person. Imitation is directed by the infant’s motives. It thus appears in situations which the infant experiences as being of especially interest. During the pre-language stage the infant’s motives are orientated towards activity with objects and, by approximately eighteen months, also towards active speech.

Infants display imitative behaviour as soon as they are born. At first it appears as reflexive imitation concentrated around the area of the mouth. Delayed imitation begins to emerge in activity with objects at about nine months (Meltzoff & Gopnik 1989). From the start of the second year imitation becomes the infant’s main means of learning.

Meltzoff (1990) considers imitation to constitute an important building block in the formation of identity. While imitating an adult’s actions, the infant recognises both the temporal continuity of such actions and the similarity between the adult’s and his own behaviour. In this the infant may indeed possess a primitive understanding of the similarity between people and of people’s ability to share ideas with one another. Bretherton (1991) came to similar conclusions in his description of imitation as being both a social and a psychic phenomenon. Examined from a psychic, or mental, viewpoint imitation shares
a number of characteristics with representation, where the infant builds internal pictures based upon his experiences of and perceptions about behaviour.

Researchers have differed in their conception of the nature and significance of imitation in relation to shared attention. For example, Tomasello (1995) is of the opinion that imitation is not especially typical of divided attention, but is merely in certain respects associated with it in. During the pre-language stage imitation occurs in the context of activities with physical objects. In such situations something is done and as a result of this action some consequence follows. This makes imitation interesting from the perspective of shared attention. But to what extent is intersubjective awareness involved here? When the infant observes the adult’s activity with objects is he aware of the adult’s intention to accomplish something. Or is the imitation merely a practising of a given function in order to obtain mastery?

3.5 The shoots of language

From the age of about nine months the infant begins to direct the adult’s attention towards objects via intentional communication. This happens at first through the use of non-linguistic gestures and use of voice. Most children begin to produce word symbols from the start of the second year and use them at first in order to gain attention. Infants acquire the greater part of their early vocabulary through shared interaction with adults (for example, Bruner 1983). We can say that by experiences of states of shared attention the infant learns both to understand and to himself produce language.

Why is the state of shared attention so beneficial from the standpoint of language learning. Shared attention creates in itself a favourable climate for language learning because both infant and adult simultaneously attend to one common object. In such situations their individual attentions are fixed towards the same external object or event. Thus we have a situation in which messages from the adult to the infant are conveyed via the help of observations and actions.

Precisely how the adult acts in situations of common interaction is also of import. The infant’s language learning is furthered by situations of interaction in which the adult follows the infant’s focus of attention, carefully guiding it, exploits the act of orientation by giving names to the various objects of attention and generally invests the overall process with a linguistic setting (Dunham, Dunham & Curvin 1993).
From about eighteen months the infant has an awareness of shared attention. At the same time he is competent in turn-taking activities and the motives for imitation begin to be directed towards active speech. The infant understands that shared attention has a communicative value. Language gradually begins to dominate the interaction between infant and adult. Non-linguistic communication falls away, the range of linguistic expressions broadens and the infant’s vocabulary begins to grow significantly. In truth non-linguistic communication continues to have a supporting effect on the development of linguistic expressions for a considerable period of time.

3.6 Conclusions

The infant begins to assimilate the various manifestations of shared attention from the age of about nine months. These develop qualitatively during the second year, becoming increasingly refined and beginning to serve intentional and intersubjective purposes. A favourable environment for activity with external objects and the presence of an adult together encourage the development of shared attention. Importantly, the infant is in a position to bring the adult objects and to physically share them with her. The adult’s following and careful honing of the infant’s attention has been shown to be a valuable means of encouraging development. This is not, however, self-evident to the adult and neither is it easy. It demands a consciousness of the infant’s desire and ability to strive and manage himself. The infant is himself able to orientate towards activities required for his development but the adult is needed to invest these activities with enriching content. At its most useful, the state of shared attention combines these developing activities and so creates the ideal environment for the development of language and for learning in general.

Turn-taking games are more than merely an enjoyable way for the adult and infant to spend time together. We should be aware of their manifold meaning for the early development of the infant. Of particular note is their significance in the development of the various manifestations of shared attention. Imitative turn-taking affects many areas of development. It is fundamentally cognitive by nature: in turn-taking games significance relationships are investigated and practised in the context of social interaction. Turn-taking games are based upon proximity and are keys to the understanding of others and to the realisation of ones own distinctiveness. Reciprocal intentions and mutually compatible interaction indicate to the infant that he is, in his own nature, similar to other people without being identical (Tomasello 1995). In addition, feelings
form an essential element within turn-taking play. They are conveyed with the help of rhythm and tension and these elements in turn give rise to laughter. Laughter in turn-taking play thus assumes a semiotic function, something which, according to Kristeva (1993, 126), “is inevitable for the construction and transferal of the semiotic as part of a symbolic whole”. In themselves turn-taking games embrace all the most essential features of shared attention.

The empirical stage of this research consisted of a long-term study of six mother-infant pairs under laboratory conditions (Tolonen 1997). The manifestations of shared attention were initially analysed from video material using a time sampling method (using the most interactive five minute excerpt from the total period of free activity recorded for each pair). The results of the analysis indicate that infants relate gradually towards events commonly experienced with their mothers. Of the periods of mother-infant free activity it would also be useful to choose entire episodes of events for the purposes of further analysis. Interaction should be analysed within the context of these events and, on the basis of this, conclusions may be drawn as to how the manifestations of shared attention appear and develop.
REFERENCES


COMMUNICATIVE READINESS OF PRESCHOOL CHILDREN FOR SCHOOL REGARDED AS THE ABILITY TO SOLVE COMMUNICATIVE Speech PROBLEMS

Communicative development of a person which is included into his overall psychic formation and which is closely interrelated with its main lines, i.e. the development of one’s personality, intellectual sphere and activity is a lifelong, cyclic and nonhomogeneous process. It falls into certain stages and periods, one of the primary among them being the period of preschool education which serves as the basis for all further development of a person, namely his successful training at school and future professional activities. Investigating the problem of communicative readiness of preschool children for school it is necessary to analyze the specificity of communicative development of a child as such taking into account the formation of speech and thinking activities. But first of all it is essential to formulate the main principles which underlie this kind of analysis. The first principle to be mentioned in this respect is that of unity, correlation and interdependence of all types of human activity. It was put forward by L.S.Vygotsky [3] in connection with the idea of correlation between communication and generalization. The second principle is that of social conditionality of the development of a person in different age groups [3, 10]. The third is the principle of succession, i.e. setting up close correlation between the most important features of one’s previous and subsequent development [14, 15, 5, etc.]. To determine the scope of preschool age group from its beginning to end, and to describe the characteristic features of the communicative development of a child belonging to this age group we will make use of two classifications, one being the classification of psychic development as a whole worked out by D.B.Elkonin and V.V.Davidov [24, 5], and the other being the classification of speech development suggested by A.K.Markova [15]. We will respectively consider that the main principles of these classifications are attributable to the communicative development analysis. Thus, the leading activity of each age group plays its decisive role in the formation of the communicative maturity of a person whereas new age psychic and speech formations are closely connected with new formations in the sphere of communicative activity of a person, constituting its basis. Another thesis of primary importance is that communicative development as such is a
succession of gradual changes (from one age group to another) in the communicative development of a person which we treat as the formation of communicative problem solving in the process of the person's interaction with other people. We fully agree to the idea formulated by M.I.Lisina [12] according to which each communicative as well as any other problem creates the situation of problem solving that motivates the person to act and solve the problem by means of this activity. Treating one’s communicative development as the making of the ability to solve various communicative speech problems allows us to regard the new formation of each age group as the main changes in the nomenclature of the problems used in the process of verbal behavior, as well as the mode of their solution, the latter being primarily determined by the specific age peculiarities of speech and thinking activities of a person.

Speaking about different periods and stages in the communicative development of a person it is necessary to mention that preschool age group is one of the most important among all of them. It is in that very period that the basis for further communicative activity is laid, which predetermines the success of school training in future. Preschool period itself, its general characteristic features, the specificity of speech and thinking formation in particular have always been widely investigated. However, the communicative aspect as such needs further intensive research. The analysis of the problem of readiness of preschool children for school training, which is of both theoretical and practical importance, includes the communicative aspect of children development. In other words, it coincides with the problem of communicative readiness of preschool children for the system of training at school. It goes without saying that the problem is quite urgent as long as the modern level of primary education is sufficiently high and requires well developed speech and thinking activity of a child and comparatively high level of his communicative competence, the latter in its turn predetermining successful training of a child in primary school and eventually the success of his future education.

Discussing the problem of readiness of preschool children for school one should focus on the factors underlying it. One of the main among them is the character of the child’s communicative activity which depends on a number of external and internal conditions. External conditions include such things as the people who constitute the child’s sphere of communication and the way it is formed, the character and the level of influence exerted on the child by the grown-up, the professional level of this influence, the absence or presence of special work aimed at developing speech, thinking and communicative activities of a child, etc. Internal conditions include the general age peculiarities of preschool
children as well as the level of their speech, thinking and communicative activities.

Consider the main of the above mentioned conditions in more detail. It is common knowledge that a child starts communicating with grown-ups beginning with the first days of his life. The psychic development of a child is carried out by means of acquiring the social experience which is accumulated in the behaviour of a grown-up who is regarded as an example to be followed. It is the preschool age which is usually referred to as the period when the child acquires the experience of adults most intensively. The degree of the child's tendency to follow the example of grown-ups depends on how closely the child and the adult are acquainted with each other, on how authoritative the grown-up is towards the child, on the emotional colouring of their relations [3, 10, 6, 25, 12, etc.]. But acquiring a language does not only mean imitating somebody who is older and more experienced. This process is closely connected with language generalization and being conscious, though on some elementary level, about language phenomena. It is largely because of this fact that certain well organized activity of a grown-up aimed at forming language generalizations and realizing language and speech phenomena is required, which is extremely important for developing the communicative activity of children [21]. Our own observation of senior preschool children show that they behave adequately in the situation of personal contact with a grown-up. Active purposeful adult influence contributes to the development of interaction between a child and a grown-up during which speech statements of a child are adapted to the speech patterns of a grown-up, different language aspects are worked out and acquired by a child. Transition to verbal communication with adults that does not depend on the situation allows children to «hear» and understand the speech of adults [3,12], which, in its turn, makes for the formation of readiness for school.

Irrespective of the fact that communication with grown-ups is extremely important for children, at a certain period of preschool development it turns out to be insufficient for children. By the age of six the subjective significance of wide social surrounding is substantially enlarged to include not only close relatives, but grown-ups unknown to children [12]. At the same time there appears a steadily growing tendency for a child to communicate with other children, i.e. to further enlarge the sphere of his contacts, which contributes to the development of personality and activity of preschool children especially if this communication is well organized and is adequate to the age [10, 6, 25, 12, 16, 18, etc.]. At the same time, the role of communication with children
greatly affects the child’s readiness for school, and the character of this communication is genetically due to the character of relations between children and adults, both of them being equal partners in their common activity [9].

Turning to the discussion of internal conditions of communicative activity formation it is essential to point out some factors of primary importance such as age peculiarities of preschool children psychic development as a whole as well as the specificity of various psychic functions, the main being thinking, speech, speech and thinking activity. All of them were substantially studied by psychologists from different countries of the world both theoretically and practically. Thus, it was shown that by the end of preschool period a child is able to express his thoughts more or less coherently, makes use of elementary thinking operations that are connected with definite actions, acquires causal relations which are restricted by the scope of his experience, applies verbal planning actions and reasoning [24, 25, 13, 15, etc.]. All these make up the basis for the emergence of intellectual regulating function of speech which means that speech precedes and organizes the child’s actions, the tendency itself being connected with the development of game playing activity as the leading activity of preschool children [4, 25, 15]. Senior children of this age group make use of grammatically, lexically, and phonetically correct speech, apply different parts of speech, are able to make up sentences according to the norms of the spoken language and select words and word combinations to express their thoughts [28, 26, 31, 27]. Due to the role play, there appear new forms of speech, such as instructive speech, narrative speech, and others. Special emphasis is to be placed on the fact that preschool age is the very period when there develops the ability to adapt one’s speech to different partners as well as various situations of communication, which results in selecting language means in accordance with a definite situation and applying either situational or contextual speech appropriate to each situation. These abilities lead to the emergence of another function, that of exerting influence and regulating other people’s activity [15, 11]. In other words, preschool period is characterized by the intensive development of communicative activity which allows to lay down the necessary foundations for developing the ability to exert different types of influence on a certain partner of communication, and thus solve various types of communicative speech problems more or less successfully.

The investigations referred to earlier were connected with the analysis of speech as such, speech and thinking activity, and speech development of a child. If we enlarge the sphere of investigation to include communicative aspects in
the development of a child we will have wider and more precise understanding of the specificity of children’s formation. The notion of «communicative development» seems to be more appropriate to the nature of communication as a specific type of human activity than the notion of «speech development» traditionally applied by the investigators of the problem [8, 32]. Communicative development encompasses both traditionally investigated tendencies of improving the structure of coherent utterances, enlarging the vocabulary, acquiring more and more complicated grammar rules and phenomena and the progressive changes in the development of all types of speech activity, in the character of their interconnection, in the making and complication of speech mechanisms, in enlarging the scope of means and modes of forming and formulating one’s thought.

We consider it reasonable to analyze communicative development proper on the basis of the concept of «communicative age» [17] which can be derived from our understanding of communicative activity as the process of solving communicative speech problems by the listener and the speaker in turn. New age formations in the scope of communicative problems which promote the verbal behaviour of a person, as well as the mode of solving a particular problem may serve as a criterion for «communicative age». On the one hand, this concept is derived from that of «speech age» put forward by A.K.Markova [15]. On the other hand, it appears to be much wider and more detailed encompassing alongside with the specificity of speech and thinking activity formation the character of the communicative development of a person. Thus, this concept makes it possible to make a substantial analysis of the character and the main tendencies of the personality communicative development. This approach to the communicative development of preschool children, i.e. the one based on the concept of communicative age, and the analysis of the range of communicative speech problems solved by the children in the process of their verbal behaviour and relevant to their age abilities, seems to be highly productive for defining communicative readiness of preschool children for school.

Passing over to the analysis of the personality communicative development as such, it is essential to notice that the character of communicative maturity of junior, intermediate and senior schoolchildren, and university students has been thoroughly investigated by a research group that worked under the supervision of I.A.Zimnyaya [for more information see 32], whereas the character of communicative activity of preschool children requires further investigation. In such works more attention is traditionally paid to the analysis
of productive types of speech activity aimed at solving various problems. Thus, experimental research of the age problem solving peculiarities typical of schoolchildren and students of higher educational institutions [17] resulted in a number of conclusions, the first being the fact that all communicative problems used in the course of communication with people can be classified according to the degree of their communicative orientation and the character of reality reflection. The second conclusion is that the psychological nature of communicative problems is relevant to the age peculiarities of personality. The third one consists in the fact that the communicative development of each age period is characterized by a certain nomenclature of problems adequate to the abilities of students of this age group and those belonging to the so-called «zone of the immediate future development» (the term introduced by L.S.Vigotskiy) of this age group. The forth conclusion coincides with the fact that communicative development as such is determined by both the character of communicative problem solving as a whole, and the specificity of solving each problem taken separately. The mode of communicative problem solving was described according to I.A.Zimnyaya by means of analyzing the text as the product of speech, thinking and communicative activity, the text being regarded as the unity of three spheres, i.e. the sphere of the subject content, the sphere of the meaning content, and the sphere of the speech and language shape of the text. Analyzing the parameters of each sphere made it possible to reveal the specificity of communicative problem solving mode peculiar to schoolchildren and university students, and the main tendencies of its formation in the course of personality communicative development. The investigation referred to above allows to work out the primary lines of preschool children communicative development research. Hence, it allows to define the character of children's readiness for school. Extrapolating tendencies revealed to the period of preschool development it is possible to describe a preschool child from the point of view of his ability to solve various communicative problems in the process of communication with grown-ups and other children.

In the course of development, socialization and acquisition of subject actions a child acquires communicative skills and the language as the primary means of communication. All qualitative and quantitative skills of preschool children result in developing the ability to express their own thoughts in different situations which refer to various spheres of communication. Children’s utterances are often reproductive in character, i.e. children prefer to reproduce things learnt by heart, to retell the text, either read or heard, rather than make up utterances of their own. That is why it is especially important for grown-ups to communicate with children using utterances which are correct from the
speech and language point of view because adult speech serves as a certain kind of pattern to be followed by young children. Preschool children often reproduce things heard or seen earlier, thus enlarging their own speech and communicative experience. Senior preschool age period is commonly characterized by transition from situation-based to context-based utterances. Children of this age group start selecting words to express their thoughts purposefully and consciously. According to the data obtained by V.S. Mouhina [16], a six-year-old child makes use of about three to seven thousand words, the balance of active and passive vocabulary being approximately one to two, which was mentioned earlier by V. Stern [30], who emphasized the fact that productive speaking lags behind understanding until the period of maturity. Preschool children’s vocabulary mainly consists of nouns, verbs, pronouns, adjectives, numerals and connectives. Children widely apply derivatives, show the ability to choose the right words to express this or that thought, acquire complex sentences, conjunctions, etc. Thus, the orientation in the system of one’s mother tongue is intensively developed. Children’s utterances can be sufficiently coherent and logical, they can express cause and effect relations. However, integral coherent monologues as such are not formed yet. All instances of progress in the development of preschool children are primarily connected with the formation of speech and thinking activity, and can be regarded as a fundamental basis for developing communicative skills and abilities, the main being the ability to solve various communicative speech problems in the process of communication with people.

Communicative aspects of preschool children development proper, the specificity of communicative problem solving require special investigation which would continue the general line of experimental research of the verbal behaviour of schoolchildren and university students in the course of their interaction with other people [17]. However, on the basis of the overall analysis of preschool children speech and thinking activity, one can hypothetically assume that the main speech problems most frequently solved by preschool children are «informing» and «questioning». Playing a special role in the formation of a child, questions first appear in children’s speech at the age of two or so [30] and are aimed at exerting specific influence on the partner of communication, through which children acquire the surrounding world. At the same time, a six- or seven-year-old child is already able to give exact, concise and full answers to different questions himself [21]. Such problems as «describing» and «explaining» emerge at this age period and start being regarded by children as specific modes of influence on the partner [8]. Senior preschool children are also able to make up a consistent descriptive or plot story on this or that
topic suggested. It is important to mention that emotional attitude to the objects described is to a certain extent underdeveloped at this age [21]. On the whole «describing» and «explaining» as communicative problems can be treated as the so-called «reserve» of the preschool children communicative development. Meanwhile, the importance of game playing as the leading activity of this age group is not to be underestimated. The role play helps lay down the foundation for the communicative formation of a child. It is through this activity that a child acquires the ability to take and play various roles selecting speech and language means of implementing his verbal behaviour and adapting his own speech to constantly changing communication conditions and different partners. In other words, preschool age is the period of forming such abilities and skills which are further developed throughout the periods of school and university training. The level of preschool children communicative development, the degree of their communicative competence, the ability to raise and solve psychologically different communicative problems, the range of problems by means of which verbal behaviour is fulfilled, the peculiarities of the problem solving modes determine the degree of preschool children communicative readiness for school.

In this respect, it is quite essential to mention that the process of communicative maturity of a child may be quite spontaneous, i.e. free of any adult influence. That means that well organized purposeful training can substantially accelerate the children’s communicative development implemented through the ability to solve communicative speech problems. It was in particular shown in the experimental work of E.V.Chukreeva, which we are going to focus on.

The experiment conducted in preparatory groups of kindergartens was aimed at revealing the specificity of preschool children communicative activity in the course of traditional and specially organized training. The examinees (58 children) equalized beforehand according to the level of their intellect were asked to make up a story based on the plot picture, to reproduce the tale read by the teacher, and to make up a story without the support of key words. In other words, preschool children were asked to solve three different communicative problems. The analysis of the data obtained in the control group where children were taught traditionally showed that the existing programme for speech development training does not provide the sufficient grammatical, lexical and orthoepic level of preschool children communicative development. Besides, the programme fails to form the level of communicative competence that is relevant to senior preschool children. In the experimental group where children were taught for two months some parameters of the mode of forming
and formulating thought in the process of making up utterances of different communicative orientation changed substantially. Thus, the average growth of vocabulary was about 10%, this rise being accompanied by the decrease in the number of mistakes. The most considerable growth was in the retelling of the text where the increase was as high as 14% (58 words in the control group as compared to 66 words in the experimental group). Lexical saturation of the utterance gave the average growth of 6%, the highest value of this parameter referring to the description of plot pictures where it rose from 74 to 80 words, i.e. by 6 words. The solution of this communicative problem is characterized by the most considerable increase (11%) of the number of sentences which make up each utterance, as well as the number of meaningful words per utterance (15%). Some parameters, such as the complexity of thought, grew slightly, which might mean that the complexity of thought as such is formed later, i.e. when children are at school. The data obtained allow us to conclude that preschool children are hardly conscious of the difference between various communicative problems as modes of influence exerted on the partner. Although, the qualitative analysis of a number of parameters proves that children turn out to be most successful retelling the tale read by the teacher. This conclusion of ours fully coincides with the tendency of children to prefer reproductive activity. Besides, they are successful enough in describing the picture. However, that does not necessarily mean that preschool children can attain the optimum mode of solving these problems.

Thus, the theoretical and experimental analysis of psychological peculiarities of preschool children communicative activity allows us to conclude that the character of their communicative activity, their achievements in the level of communicative competence which are determined by both the age abilities of preschool children, mainly the abilities of their speech and thinking activity, and a number of external factors of development (the circle of communication, the character of influence exerted on the child in the process of communication, the absence or presence of the system of purposeful training, etc.) define the degree of preschool children communicative readiness for school. Specially organized purposeful training aimed at communicative formation of children alongside with their speech formation, particularly at developing the ability to raise and solve communicative speech problems relevant to the age peculiarities of children, can considerably promote the communicative readiness of preschool children for school.
ZWEISPRACHIGKEIT IM KINDERGARTEN - EINE PERSON - EINE SPRACHE-

Sigrun Veigel in her paper handles a case of early language immersion with the method one man one language. She has been working as a german - speaking teacher in a hungarian kindergarten co-operating in with the german partner. The experiences of this action research have been discussed.

1. Der geschichtliche Hintergrund

Wie kommt es, daß in Ungarn der deutschen Sprache so große Bedeutung beigemessen wird? Ich zitiere aus der Satzung der Stiftung „Deutscher Kindergarten EYE-Hungary“:

“Die natürliche Zwei- bzw. Mehrsprachigkeit in Westungarn“

2. Die Sprachvermittlung in den Nationalitätenkindergärten in Ungarn

Es gibt bis heute folgende Lösungsansätze:

- 50-70 Wörter und Redewendungen bei 3-jährigen
- 70-90 Wörter und Redewendungen bei 4-5-jährigen
- 90-100 Wörter und Redewendungen bei 6-jährigen Kindern.
(Laut dem Handbuch für Deutsch an Nationalitätenkindergärten von 1975)

Doch der Wortschatz ist nur einer von vielen sprachlichen Faktoren. Die Zahlen zeigen jedoch, daß hier nicht hoch gegriffen wurde. Kinder, die aus diesen Kindergärten kommen, können zwar einige deutsche Wörter, Lieder und Reime, jedoch können sie sich in alltäglichen Situationen nicht in Deutsch ausdrücken!

Aus diesem Grund gründeten Ágnes Szauer, damals Lehrstuhlleiterin für Nationalitäten und Fremdsprachen an der Hochschule für Erzieherinnen in Ödenburg/Sopron und ihr Kollege Ferenc Tauber die Stiftung „Deutscher Kindergarten“, für das Gebiet Sopron und Umgebung.

3. Die Idee der Stiftungsgründung Anfang - Heute - Zukunft des Projekts


Während in Agendorf eine völlig neue Gruppe entstand, wurde in Kroisbach eine bestehende Nationalitätengruppe zu einer zweisprachigen- umfunktioniert.

Nach zwei Jahren, im September 1996 löste dann Sandra Mark Sigrun Veigel in Agendorf ab, sodaß das Projekt mit der zweiten deutschen Erzieherin ohne Unterbrechung weitergeführt werden konnte. In Kroisbach arbeitet jetzt eine
sehr gut deutsch sprechende Ungarin weiter.

Frau Wendlandt, eine deutsche Sozialpädagogin, konnten wir für die praktische Projektbegleitung gewinnen. Sie besucht beide Gruppen regelmäßig und führt auch Sprachstandsmessungen durch. 18 Kinder aus Agendorf kamen im September 1997 in die Schule.

Dort ist für die weitere deutschsprachige Förderung gesorgt, d.h., daß einige Fächer ganz in deutscher Sprache unterrichtet werden. Auch andere Städte im Westen Ungarns sind nun von der Effektivität der Methode des Projektes überzeugt und übernehmen die Arbeitsansätze.

In den vergangenen drei Jahren, seit Beginn der Projektarbeit, konnten wir einen großen Erfolg bei den Kindern feststellen. Sie haben auf spielerische Art und Weise deutsch gelernt.

Einige Kinder sprechen sogar lange Sätze mit Nebensätzen, z.B. Die Glocken läuten, ich glaube, es ist jemand gestorben. usw.


4. Doch - was ist Sprache?

Nichts unterscheidet den Menschen mehr von allen anderen Lebewesen als der Besitz der Sprache.


Wie jedoch der Erwerb der Muttersprache abläuft, ist den meisten Menschen nicht bewußt. Wir waren zu klein, um darüber nachzudenken...

Es gibt verschiedene Theorien, die den Spracherwerb erklären wollen. Es ist aber bisher nicht gelungen, eine lückenlose und widerspruchsfreie Theorie über den Erwerb der Sprache vorzulegen.
Der Spracherwerb:
Einzelmern grundlegende Merkmale:
1. Man geht davon aus, daß es universelle Spracherwerbsstrategien gibt, die jeder Mensch anwendet. (LAD = Language Aquisitation Device)
2. Die Sprache wird zerlegt und einzelne Strukturmerkmale werden herausgefiltert.
3. der natürliche Spracherwerb von erster und zweiter Sprache verläuft also in einer geordneten Abfolge von Entwicklungssequenzen.

Ich möchte noch eine grundlegende und allgemeingültige Erscheinung hervorheben, die ich bei den Kindern immer wieder beobachten konnte.

"Die sofortige Herstellung des Sinnbezuges zwischen Bezeichnung und Bezeichnetem."

Das Kind hat also die Fähigkeit, aus der Flut der Sprachlaute und Erscheinungen in der Umwelt und aus dem stetigen Wechsel der Situationen, die Bedeutungskonstanten herauszufiltern.

Beispiel:

5. Der Erstspracherwerb

Einige bedeutende Entwicklungssequenzen werden hier behandelt:

5.1 Die vorsprachliche Phase

Beispiel:
Das ungarische “gy“ oder “ny“. Im Deutschen der “ang“ Laut und das “ch“.
Erkenntnis der bedeutungsvermittelnden Funktion der Sprache: Die Sprachmelodie, die Betonung, die Lautstärke, die Tonhöhe und der Sprechrhythmus sind wichtige Merkmale.

Beispiel:
Lob und Tadel können dadurch schnell unterschieden werden.
Tadel: “Warum schlägst du schon wieder den Laci ?!“
Lob: “Das hast du schön gemacht, prima !“

Das Verständnis entwickelt sich primär in Assoziation mit Gestik, Mimik und den genannten Lautfunktionen. In der Anfangszeit meiner Arbeit mit den nur ungarisch sprechenden Kindern, wurde mir die Bedeutung der nonverbalen Sprache bewußt, die das dann tatsächlich gesprochene Wort unterstreicht und die Bedeutung vermittelt.


5.2 Sprache und Denken

Mit ca. zwei Jahren verbinden sich die Entwicklungslinien des Denkens und des Sprechens. Das bedeutet, daß das Sprechen und das Denken jeweils einen eigenen Ursprung haben.

Das Lallen und die ersten Worte sind vorintellektuelle Stadien in der Sprachentwicklung und haben mit Denken nichts gemeinsam. Mit der Verbindung beider Entwicklungslinien wird die Sprache intellektuell und das Denken sprachlich! Ein qualitativ hervorragendes Denken ist kaum ohne Sprache denkbar, so wie die menschliche Sprache auf das Denken angewiesen ist.

Für das Kind bedeutet das Eindringen in den Bereich der Sprache das Eintreten in den zunächst nonverbalen, gedanklichen Dialog.
Und genau das ist von großer Bedeutung in Bezug auf den Zweitspracherwerb!

Es sieht oftmals so aus, als ob sie gar nicht lernen würden. Doch ich als Erwachsene wollte den Erfolg sehen bzw. hören...

Dieser nonverbale, gedankliche Dialog dauerte bei den Kindern unterschiedlich lange, von ein paar Wochen bis zu einigen Monaten.


5.3 Der Wortschatz und die Strukturierung der Sprache

Die Kinderpsychologin Schenk-Danzinger sagt:
"Zwischen zwei und drei Jahren zeigt das Kind eine besondere, spontane Aktivität beim Aufbau des Wortschatzes, den es durch unzähliges Fragen ("Fragealter"), die immer wieder gestellt werden, (Wiederholung-Gedächtnis) zu erweitern sucht."

Die Sprache bildet im Vorschulalter einen Schwerpunkt der kindlichen Lernfähigkeit! => Diese Kapazitäten sollten gezielt genutzt werden!!

Der Erwerb des Wortschatzes ist Voraussetzung, um die Strukturen der Sprache zu erwerben. Gerade in dieser Phase des erwachenden Strukturbewußtseins ist die Förderung durch die Umwelt von großer Bedeutung. In der Zeit des Kindergarten eintritts, ab drei Jahren, sind die natürlichen Voraussetzungen für den Erwerb einer oder mehrerer Sprachen besonders günstig.

5.4 Grenze des natürlichen Zweitspracherwerbs

6. Der Zweitspracherwerb

Es gibt verschiedene Möglichkeiten des Zweitspracherwerbs: Mischen, in den beiden Elternteilen eine andere Muttersprache sprechen und den Kindern von Geburt an beide Sprachen vertraut sind. Ethnische Minderheiten, die ihre Sprache als hauptsächlichen Kulturträger pflegen und durch die Pflege der Sprache ihre Identität erhalten. Ausländer, die in ihrem Gastland die dortige Sprache lernen. Und viele andere Varianten...

Grundsätzlich unterschieden wird:

6.1 Der natürliche Zweitspracherwerb

D.h. die Kinder haben von Geburt an, oder ab dem Kindergarten, Bezugspersonen um sich, die beide Sprachen perfekt beherrschen. Also zwei Sprachmodelle darstellen und verkörpern. So, wie das im Deutsch Ungarischen Kindergarten nach dem Modell „Eine Person - eine Sprache“ umgesetzt wurde.

6.2 Der unterstützte Zweitspracherwerb

Er stellt eine Unterstützung des natürlichen Zweitspracherwerbs dar, durch gezielte sprachdidaktische Übungen und Spiele. Dies allein genügt jedoch nicht, um die Sprache kommunikativ anwenden zu können!

6.3 Der Unterschied zur Fremdsprache

Beide Formen unterscheiden sich vom Fremdspracherwerb insbesondere durch den weit früheren Beginn, (Im Deutsch Ungarischen Pilotprojekt mit Beginn des Kindergarteneintritts) die anders geartete Motivation, den Sozialisationsaspekt in eine andere Kultur, und das weit höhere Niveau an Sprachbeherrschung und Sprachausformung, die unter entsprechenden Bedingungen erreichbar ist. Zweisprachigkeit ist keine statische Erscheinung!

Zwischen dem Verstehen des ersten Wortes einer Zweisprache und deren authentischer Beherrschung, liegen eine Reihe von Zwischenstadien.

Je nachdem, welche Sprache häufiger gesprochen wird, bzw. gefördert wird, entwickelt sich normalerweise die eine zur “starken” und die andere zur
“schwachen“ Sprache.

Die Kinder unseres Projekts haben die ungarische Sprache als „Muttersprache“ und zugleich “starke Sprache“.

Zweisprachigkeit
Pro-Contra

Toleranz

Vielseitige lerntbereitschaft

Erweiterter Horizont

Flexible Denken

Überlegene Auffassungsgabe

Korrekte Aussprache

Sie wird deren Denksprache bleiben und spontanes Ausdrucksmittel in Augenblicken der Erregung sein.

Ziel des Pilotprojekts: Wir streben die “ausgewogene” Zweisprachigkeit an. Keineswegs bedeutet das identische Zweisprachigkeit, das wäre utopisch.


Dabei darf nicht verschwiegen werden, daß die Frage, ob Zweisprachigkeit nützlich oder schädlich ist, gegensätzlich diskutiert wird.
6.4 Ist Zweisprachigkeit nützlich oder schädlich?


7. Das Modell: "Eine Person - eine Sprache“, was ist das?


Das klassische Rezept stammt von dem französischen Phonetiker Grammont. Er empfahl, daß das Kind sich mit dem jeweiligen Bezugspartner ausschließlich in dessen Sprache verständigen soll.

Beispiel:

Beispiel:
Zunächst nannten mich die Kinder auf ungarisch die nőmet óvóneni, nach drei Wochen war ich dann die Tante Sigrun.

7.1 Konsequenz ist elementar wichtig

Bei strikter Einhaltung dieser „funktionalen Trennung“ bildet sich in den Kindern ein konditionierter Reflex heraus, der einen situationskonditionierten Umschaltvorgang auslöst. Die Konsequenz ist dabei entscheidend!

Zitat von Kielhöfer: "Ein konsequentes Ordnungsprinzip für beide Sprachen scheint uns die wichtigste methodische Voraussetzung für das Gelingen der
zweisprachigen Erziehung. Die beste Ordnung scheint die funktionale Sprachtrennung.“

7.2 Der gesellschaftliche Status

Ein weiterer Faktor, der die Entstehung und die Qualität der Zweisprachigkeit beeinflußt, ist der gesellschaftliche Status der Sprachgemeinschaft und das Sozialprestige der von ihr verwendeten Sprache.

Beispiel:
Deutsch wird in Agendorf von der verbleibenden Minderheit gesprochen und wieder gefördert. Es gibt eine Minderheitenselbstverwaltung und einen deutschsprachigen Chor.

Einige Dorfbewohner arbeiten in Österreich und sind auf die Sprachkenntnisse angewiesen.

7.3 Die Motivation des Kindes


Eine gezielte, institutionelle, zweisprachige und auf beiden Kulturen aufbauende Erziehung sollte erst ab etwa drei Jahren einsetzen. D.h. zu einem Zeitpunkt, in dem sich sowohl die Muttersprache, als auch die von der Erstkultur geprägte Grundpersönlichkeit des Kindes in ihren wesentlichen Zügen herausgebildet hat.

Wenn eine institutionelle, zweisprachige Erziehung so erfolgt, ist den Kontrahenten, die die Spaltung der Seele und eine Mischsprache prophezeien, der Boden entzogen!
7.4 Das Verhalten der Erzieherin und des Umfeldes

All diese Faktoren berücksichtigend, arbeiteten meine ungarische Kollegin und ich, zwei Jahre in der neuen Kindergartengruppe mit 21 drei bis vierjährigen Kindern, die kein Wort Deutsch sprachen und zunächst nichts von dem verstanden, was ich sagte. Ich selbst erhielt das oft zitierte “Sprachbad”! - Dennoch wurde ich nicht müde, immer wieder die Tätigkeiten zu kommentieren.

Beispiel beim Anziehen:
Jacke (zeigen) anziehen (zeigen) Jetzt ziehen wir die Jacke an usw.


Die Kinder sprechen tausend Sprachen!

Die Sprache der Vorschulkinder ist noch stark durch Gestik, Mimik und die Intonation der Stimme geprägt. Und darauf stützte ich mich auch, um von den Kindern verstanden zu werden, bzw. zu verstehen und zu deuten, was sie von mir wollten.


Beispiel:
Wir sitzen alle gemeinsam an kleinen Tischen zum Mittagessen zusammen. Die ungarische Erzieherin und auch die ungarische Helferin sind im Raum anwesend. Szimonetta, eine Vierjährige, sagt mir etwas auf ungarisch und unterbricht sich mitten im Satz und denkt:”Ach so, Tante Sigrun versteht mich ja nicht!” Sie überlegt, wie sie mir ihr Anliegen verständlich machen kann und schaut mich verlegen und etwas hilflos an. Ich kann mir nicht denken, was sie von mir möchte und muß ebenso hilflos geschaut haben, worauf wir beide zu lachen anfingen. Zoltan saß am selben Tisch und hat die Szene verfolgt. Er ruft: “Tante Sigrun, schau mal!” Und er hält zwischen Daumen und Zeigefinger
eine Erbse und zeigt darauf.


Szimonetta hätte es leichter haben können, indem sie die Mária darum gebeten hätte, doch sie wollte es von mir haben und nahm die geistige Anstrengung in Kauf. Zoltan und die anderen Kinder, die der Situation beigewohnt hatten, haben diese Lektion gleich mitgelernt. Das sind Kinder beim situationsorientierten, spielerischen Lernen!

7.5 Wichtige Grundregeln, um das Ziel der ausgewogenen Zweisprachigkeit zu erreichen:

1. **Konsequente Einhaltung der funktionalen Sprachtrennung.** “Eine Person - eine Sprache“
Beide Bezugspersonen sprechen nur in ihrer Sprache!

2. **“Herstellung und Erhaltung des sprachlichen Gleichgewichts.“**

3. **“Verständnis und Geduld“**
Die Einsicht, die wir bei den theoretischen Grundkenntnissen gewonnen haben, zeigt, daß eine ausgewogene Zweisprachigkeit nicht schadet, sondern nur nützen kann. Andererseits ist die Handhabung zweier Sprachen schwerer zu erlernen und zu meistern, als eine einzige.

4. **“Zweisprachige Erziehung ist gleichzeitig auch Erziehung in zwei Kulturen“**
Dies wird über Lieder, Finger- und Kreisspiele, Feste und den Umgang miteinander geprägt. All das läuft spielerisch und ohne Zwang ab, in einer Atmosphäre, die Liebe, Geborgenheit und die Befriedigung der kindlichen Grundbedürfnisse an erste Stelle setzt. Das Interesse der Kinder ist dafür der einzig gültige Gradmesser!
Wer als Erzieherin sich dies zur Aufgabe gemacht hat und Kinder so erziehen will, muß allerdings bereit sein, die Ausschließlichkeit seines eigenen Wert- und Normsystems in Frage zu stellen und aufzugeben.

7.6. Der Kontakt mit den Eltern/Öffentlichkeitsarbeit


Die Einbindung der Eltern in dieses Projekt ist von großer Bedeutung, da sie den Kindern die Sicherheit und Motivation mitgeben; daß sie stolz darauf sind, was ihre Kinder lernen.

Beispiele der Umsetzung:
- Elternabende; Austausch der Eltern und Erzieherinnen über den Sprachgebrauch zu Hause und Aktivitäten im Kindergarten.
- Tag der offenen Tür mit speziellem Informationsprogramm
- Gemeinsame Gestaltung der Gartenanlage
- Feste mit deutschen und ungarischen Programmpunkten

Öffentlichkeitsarbeit:
- Der Besuch und Aufbau eines Partnerkindergartens mit Loipersbach, ein Kindergarten in Österreich, ca. 2 km von Agendorf entfernt. (Grenze)
- Tage der offenen Tür; Information durch Plakate
- Zeitungsartikel in Ungarn, Österreich und Deutschland
- Fernseh- und Radioberichte und Interviews
- Großer Auftritt in Sopron am 25. Mai 1997; Aufführung der Vogelhochzeit, gemeinsam mit dem Kindergarten Kroisbach und einigen Schulklassen und Rolf Zuckowski, dem Komponisten aus Deutschland! Vor ca. 400 Besuchern!

8. Schluß

Das Erlernen von Sprachen, ist zugleich Erziehung zur Achtung vor dem Menschen, zur Verständigungsfähigkeit und Toleranz. In diesem Sinne stellt unser Modell einen Versuch dar, mit Sprachen Brücken zu bauen: Von Mensch zu Mensch und von Land zu Land!
Merja Karjalainen

THE LANGUAGE OF PLAY, THE PLAY OF LANGUAGE

When a three or four year old child plays, either alone or together with other children, he generally both talks as he plays and plays with language as he talks. The degree to which these two forms of language are used varies both quantitatively and qualitatively both for a given child from moment to moment and according to circumstance, and also consistently between children.

The observations presented here are based upon some nine hours of video material filmed in a daycare centre in the city of Oulu. The video material monitors the play of nine normally developed three and four year old children in small groups of varying composition. The varying composition of the groups included two boys and two girls, three boys and one girls, and three girls and two boys. The video footage presents a range of differing situations within the daycare centre. The majority of play situations involve the children building with lego or playing in or near the sand tray. In their lego building the children make use of space lego. They use these to plan and build various kinds of spacecraft into which they can place figures which serve as astronauts. The children also play with sand in one particular room in the daycare centre, in the centre of which lies a free standing tray about one square metre in area and filled with sand. During their sand play activities the children build all kinds of roads and land-forms using both spades and toy machinery and vehicles. They then drive toy cars around the model landscapes they have created.

As well as media such as lego and sand, play sometimes involves other situations such as eating or modelling. Children are prolific in inventing games involving anything from a potato to a fork. Play really is an essential part of a child’s behaviour.

When observing these children playing, I noticed that they did not all participate actively in any given play situation. It was typical with the group of three boys and one girl, for example, that the boys would play amongst themselves whilst the girl would take part only intermittently. At other times she played or built objects alone, even though she was still in close physical proximity to the boys. The common games recorded in my material are most typically tradi-
tional boys games. This was probably due partly to the nature of the play materials available to the children and partly to the composition of the group.

Language play appears in all situations recorded in my video material, but especially during free conversation and eating. A frequent observation made was that if one child initiated language play then gradually the others present would join in.

1. Talk accompanying play

The children in my sample talk continuously during play recorded in the material. They use language during play chiefly for one of the six following reasons:
1. directing the course of play and the behaviour of other participants,
2. commentating on aspects and tasks relating to a particular fantasy,
3. role play,
4. informing others concerning the management and use of particular objects,
5. comments of an emotional or evaluative nature,
6. drawing attention and other forms of controlling conversation

In addition to these functions children also use language simply for the sake of playing with language. This will be dealt with separately in section two.

1.1. Directing the course of play and the behaviour of other participants

In order for children to be able to play together they need to make sure that more or less mutual agreement has been arrived at regarding both the contents and the purpose of the play. In other words, the play must be kept to at least some degree coherent in order for it to remain common to all participants. This requires the participants to act in a sensible manner within the context of the play. Children direct play and the behaviour of one another most noticeably through verbal means. Smilansky (1968: 7) confirms that, especially in play of a social-dramatic nature, it is typical for participants to communicate amongst themselves in order to maintain common play through the use of language. It is also a characteristic of play that children playing out various roles work these out together. Those involved in play use language to refer to places, actions and situations.

According to my observations, children very often direct play together in such a way that no clear leader emerges. Sometimes, however, one of the children may either temporarily or more permanently orient himself (or herself) as the
leader of his own small group of three to five children. Of the children ob-
erved in my material, however, not all were equally willing to assume the role
of leader. A particularly typical leader role is played in the following example by
Juha (boy). The other clearly discernible role is that played by Taina (girl),
whose habit it is to follow and provide feedback. As far as the structure of
adjacency pairs (Sacks et al. 1974: 716) is concerned, Juha produces the first
pair part to which Taina’s reaction provides a complement (the second pair
part). The child directing the play, in this case Juha, uses the persuasive and
fantasy-orientated conditional mood in his suggestions.

Examples in this paper are set out in the following manner. Firstly, ap-
ppears an accurate transcription of the child’s speech. The children in
question are from the city of Oulu and speak Finnish using the local
dialect. If we are to consider a specific part of the transcript it will be
emphasised in bold text. Under this comes a literal translation in italic
text, again with any point to be focused upon in bold. In cases where the
meaning of the literal translation is not clear a free translation appears
on a separate row. In examples where the literal translation coincides
exactly with the free translation the latter is omitted. In some examples
where no intelligible word for word translation is possible only a free
translation is given. In other example, if it is felt to be of use, a literal
translation is provided which describes the various grammatical func-
tions of the words. (—) indicates that what was uttered could not be
made out while other text examples in parentheses indicate unclear
speech. Parentheses in translation may also indicate that the word does
not exist in the original utterance. If these are unintelligible in Finnish
then they are reproduced in their original form in the translation. The
author’s notes concerning specific utterances appear in square brack-
ets. If it is uncertain which child produced a particular utterance it is
assigned the speaker initial X.

(1)  J: Nää ois, nää, nää ois pikkulapsija.
    These would be little children.
    These are little children.
    T: Joo.
    Yes. [Referring to imigined astronauts which J. is roleplaying]
J: Nää uskaltas aijaat tämmösellä.
    These would dare to drive in these.
    T: Joo.
    Yes. [Referring to imagined astronauts which J. is roleplaying]
J: Ne sannois tälle että heippa.
   They would say to him "Bye!"
   Then they say "Bye!"

T: Heippa.
   "Bye!"

J: Ne, ne sannois että mitä tuolla.
   They would say, that "What is there?"
   Then they say "What's that there?"

T: Joo.
   Yes. [Referring to imagined astronauts which J. is roleplaying]

J: Se luulis että ropo-, onko nuo ropotteja vaim mitä ne on?
   It would think that robo – are those robots or what are they?
   And he thinks that robo – are those robots or what?

T: Mm.
   Mm.
   (—).

X: Mmm.
   Mmm.

J: Tää aukasis, tämmösiä, tää aukas, tää aukas ikkunan. Aukas ikkunan.
   Aukasko?
   This would open, these kind, this opened, this opened the window. It
   opened the window. Did it open it?
   This opens, these, this opened, it opened the window. It opened the
   window.
   Didn’t it?

As this above example shows, children are able to exploit a wide range of
linguistic means in order to direct play. Sometimes they present both each
other and adults with direct orders. Such orders are characterised both by the
use of the imperative mood and a commanding tone of voice. A strict order
can also be expressed by other means, for example, by naming the desired
object and/or direction, eg. Ukko tänne! – Man here! - Come here, you!
Children are also able to alter the tone of the command when the need so arises.
For example, in the following situation Juha begins his sentence with a direct
order but then softens it by employing the interrogative suffix kO.

(2) J: Tuu, tuukko panneen tään, tähän.
   Come, will you come to put it here!
   [i.e. put part of an object in a desired place]
It was very common to observe that children use the passive voice in directive speech, e.g. Mennään - go + passive - Let’s go! The imperative tone of this form may vary. Generally it has the character of a suggestion but it may also carry the weight of a strict command.

(3) J: No niin, lähtään lentoon! [lähtään spoken in a commanding tone] OK! Leave [passive] into flight! OK! Ready for take off!

Children are thus able to exploit a variety of indirect forms of command and requests. Also typical is the softening of a statement using the interrogative jooko/jookos. This makes easy for other playmates to reply with the affirmative joo.

(4) R: Nämä, nämä (leikkii) kotia (-), jooko? These, these (play) homes, yes + interrog. suffix. They’re, they’re playing homes, aren’t they? ['homes· = name of the game]

Direction of activity not only concerns the handling of objects or other concrete activity. Rather, children strive to direct speech and other cognitive-based activities.

(5) J: Ne sannois tälle että heippa. They would say to him, that "Bye!"
Then they say "Bye!"
T: Heippa.
"Bye!"
J: Ne, ne sannois että mitä tuolla. [flying in the rochet] They would say, that "What is there?"
Then they say “What’s that there?”
T: Joo.
Yes.
J: Se luulis että ropo-, onko nuo ropotteja vaim mitä ne on? He would think that robo – are those robots or what are they?
And he thinks that robo – are those robots or what?
T: Mm.
Mm.
1.2. Commentating on aspects and tasks relating to a particular fantasy

Children also use language to illustrate how objects and actions should be envisaged in the context of fantasy. In these cases they accompany their actions with a commentary which describes what is going on. It is difficult to assess how intentional and purposeful such commentary is. In other words, is the child in some way aware that he should describe his imaginings to other children in order for them to be able to picture the play in the same way as he himself does? At the same time that the child commentates on his ‘moves’ in the ‘play’ of the game, he also, through linguistic choices, reveals his own relationship to the object which he presents (i.e. he plays some or other role) or represents (i.e. he plays a role through the agency of some specific object or presents an object which represents a character or individual). Through making linguistic choices the child is at times also able to alter the role figure which he has assumed.

It is common for children to refer to the fictional character they invent by using demonstrative pronouns, which serve both to highlight the fantasy and to alienate the object in question. This can be seen in example (1). In the following abridged example (6) we see how the same child may change the degree to which he identifies with the role according to his own expressive requirements. At first, Juha refers to the pilot of the rocket using the demonstrative pronoun tää – this - he. In a corresponding situation Raimo (boy) refers to the same character using the personal pronoun mää – I. In certain adjacency pairs occurring later Juha too chooses this form of expression. Children vary their assumed roles in such a way that sometimes they identify completely (minä - I) with the fictional character whilst at others they almost seem to be examining the character from a safe distance (tämä – this – he).

(6) J: (—)
Täältäkö tää ajjaa niin? iiää!
Does this drive from here so? iiääaouu!
(imitating the sound and demonstrating with his hand)
[two adjacency pairs omitted]
R: Mää asun tässä kokonaan.
I live here completely inside this.
A: ja tässä...
and here...[interrupted]
and in there...
R: Jo riittää se vaan.
It is already enough. [interrupting]

J: Tää assuu, tää assuu tassä.

**This** lives in this.

He lives there.

[five adjacency pairs omitted]

J: Minä matkustin tällä kuoppaan.

I travelled into the hole with this. [showing the object to the others]

I went down the hole in this.

Children are also adept at alternating between their imaginary and realistic roles and, at the same time, between linguistic means associated with the two types of roles. In the following situation the child first uses the demonstrative **tää** when referring to the role character he has assumed. A moment later he gives up his own role and refers to both himself and his playmate **vaihettasko** – **change** + passive conditional + interrog. suffix. Let's change round! without reference to the role character.


**This** throws. Oooh!

He's going to throw it. Oooh! [waving the object then throwing it to Raimo. “He” refers to the character role.]

J: Kiitos!

Thanks! [trying to take it off Raimo]

A: [Imitates the sound of a car. J joins in]

[short pause]

A: Hei Raimo, **vaihettasko**, ko näitä.

Hey Raimo, **change** [passive conditional + interrog. suffix] these.

Hey Raimo. Let’s change these around.

Quite often children introduce fantasy-related role changes through the use of the conditional mood. In addition to the expression of fantasy the conditional has many practical uses such as finding out whether other playmates are of the same opinion.

(8) J: Nää asuu kot-, yhessä.

These live at ho-, together.

T:Joo.

Yes.

J: Tää ois näittem puoliso.

This would be their partner. [glancing at Taina]
And she’s their wife, isn’t she?
T: Joo
Yes.

However, the use of the conditional cannot be described as regular. Children often use the indicative mood. Sometimes during play a child will indicate quite directly to others what role he is playing or what a given object symbolises.

(9) J: Mää oom Pätmän.
    I am Batman.

(10) R: Täällä on tämmönen auto.
    Here is this kind of car. [bringing a lego model]

Children’s speech in the context of play does not, therefore, relate only to roles. Rather, they also describe objects, events and actions. Because children usually use demonstrative pronouns to describe both the functions of objects and actions of individuals it is sometimes difficult to know whether a child is referring to his role character or to, for example, a lego rocket in which this assumed character is flying.

1.3. Role play

Part of children’s talk during play relates directly to the fantasy roles which they are playing. In such situations children live the lives of the imagined individuals or characters and speak as they imagine the characters would speak. According to my observations it is extremely common for children to converse with each other in this manner, with each child playing his own role. In direct role speech it is common for children to refer to their own role character using first person verb suffix and the personal pronoun minä – I, as noted in the following conversation between two imaginary astronauts playing with space lego.

(11) R: Tulet tänne, minulla on (-)
    Come here, I have (got) a (-)
J: Ei, minä en vies sinua.
    No. I (will) not take you.
R: Kyllä, tänne voi tullaj juoksemalla.
    Yes. (one) can come here running.
Go on! You could run here easily.
R: Minä olen ihan lähellä. Minä asustelen täällä.
I am very near. I living here.

In the above example the playing of the fictitious character also affects the register selected. When children play the parts of adults they use correct standard language. In their every day speech these children would normally use dialect words typical of the Oulu area, e.g. the standard minä olen, I am, becomes mää oon, while minulla on, I have, becomes mulla on. However, even children with a good command of standard language cannot always maintain the register without producing a certain amount of inconsistencies.

Although, as video material of play situations shows, children also describe the actions of the fictitious characters they have to a greater or lesser degree assumed, they may also refer to the envisaged thoughts of such characters. This is of considerable interest.

(12) A: Tämä miettii kaikkia mitä nämä avaruuslegot tekkee vierekkäin kaikki
This considers everything which these space lego models do next to each other -.
He’s thinking all about what those space lego models are doing next to each other -.

Quite often in my material one observes a certain amount of role play speech in which the child plays the parts of both speaker and listener. In such situations he changes his voice and way of speaking according to which role is being portrayed.

1.4. Informing others concerning the management and use of particular objects

Children playing also make large numbers of comments relating to the ownership and control of particular objects. Here the language employed is of a highly practical nature, not generally relying on imagination but rather fulfilling an instrumental function. The following example illustrates typical speech concerning the use of objects during play with lego. Through his statement the child explains to his playmate just what is going on and at the same time encourages him to take hold of the object in question.

(13) J: Hei, minä annan sulle yhen ukon, täältä, ota.
Hi, I (will) give you one man, from here, take (it)!
[handing it to Taina]
T: Joo.
Yes.

Announcements concerning the use of objects were also frequently recorded when children played in the sand tray.

(14) R: Se om mun.
It is mine. [referring to an object]
R: (Se oli, mää haluan.)
(It was, I want.)
(A: Ai (pakkoti)
Oh! (pakkoti)
R: Nää oli jo mun.
These were already mine.
[short pause]
R: (Oli nää) munn.
These were mine.
[short pause, clattering sound]
J: (Kiitos) mullet torni.
(Thank you) I [allative] the tower.
(Thanks) give me the tower. [taking the tower]
[short pause]
J: Mullet talo kiitos.
To me the house, thanks.
Give me the house as well, thank you!

These kinds of statements may also express a desire to direct the progress of the play. In other cases the statement functions as a practical instruction.

According to my observations it is common for the ownership of objects to become the subject of dispute. In other cases permission to handle them is often sought. At the same time the majority of questions and answers occurring during play relate at least indirectly to the management and use of objects.


1.5. Comments of an emotional or evaluative nature

Many comments made by children in play situations involve emotional content of one form or another. These appear most clearly when a child expresses his own feelings or evaluations concerning either his own or another child’s belongings, actions or achievements.

(15) R: [imitating the sound of a car]
   J: **Hausska** silta!
   **Fun** bridge! [playing with sand]
   (This) is a great bridge!

(16) J: Ompa **sopiva** tie.
   This is indeed a **suitable** road. [playing with sand]

(17) L: Oli **hyvä** auto. Fiiuuuuu!
   (It) was a **good** car. Fiiuuuuu! [imitating the sound of a car]
   J: toi superskaar.
   that a supercar.
   it was a supercar.
   L: Niin.
   Yes.

Through the use of positive comments the child expresses support for his playmate. At the same time he may reveal his own genuine feelings. Comments may also, of course, be of a negative character:

(18) R: Vähän Noora on **pöljä**.
   Noora is a bit **stupid**.

Children may also switch to a meta-linguistic level in order to assess fictitious or non-fictitious character of the play.

(19) J: Tästä tulee hirviö jos on, jos hirviö on jossaki.
    This becomes a monster if there is, if there is a monster somewhere.
    T: Ei se oo’n (nytten) hirviö. Se on semmonen
    It is not now a monster. It is a kind of  [interrupted]
    J: **Leikisti**.
    **In play.** [spoken angrily]
    Just pretending.
It is no any (hirvistykää) in play, because it is really such a monster. It isn’t just a pretend (hirvistykää), it really is a monster.

1.6. Drawing attention and other forms of controlling conversation

The video material reveals clearly how children not only attend to their own activities but also keep an eye on what others around them are doing. It is also clear that throughout play children are receptive to verbal messages coming from their playmates. However, the receptive state of others is not taken for granted and children use a variety of means to continually check that those around them really can hear them and are listening to what they say.

According to my observations, the most common means of drawing attention is to use the words hei – hey or katso – look at the start of their utterance. Such words are also imbued with powerful stress or may even be shouted. Often the winning of attention involves the listener having to switch his gaze towards some new object. In the following example the visual aspect is emphasised. The child begins his utterance without gaining the other’s attention but then notices that the other child has not switched his gaze. At this the speaker arouses the listener’s attention using the word katso (look). He then goes on to ensure the attention of all others in the room.

(20) R: Tä-, tämä-on se, katso tässä se ukkeli istuu siinä autossa.
   Kattokaapa.
   Th., this is the, here the old man sits in that car.
   Everyone look! [standing and showing the others]

   N: Mahtavaa, näytäppäs tänne.
   Excellent! Show it over here. [spoken to R, who approaches]

The following is a very typical example of drawing attention through the use of the word hei (hey!).

(21) J: Pik-, missä o-, pikkulaneetta on? Pikkunen
   The lit-, where is -, is the little planet? The little one? [imitates a rocket sound]

   R: Missä pikkulaneetta on niinhän?
   Where indeed is the little planet?
   A: [imitates a rocket sound]
X: Tämä kiertää ympäri maailmaa.  
This circles round the world.
J: Mum pikkunen keltanen laneetta.  
My little yellow planet.
[in a soft voice, as if talking to a baby]
A: Hei sä otit multa sen keltasen lanetin.  
Hey! You took the yellow planet from me. [spoken to J]

In play situations children also gain each other’s attention through repetition. If a child notices that none of the listeners acknowledges hearing what he has said then he will often try to repeat his utterance in order to arouse their attention and to make sure his message gets through. The repeat may be identical to the original in its entirety, it may be identical only in part or it may express the same content but in a new form. In the following excerpt we have a typical example of a situation in which a child repeats an utterance in altered form in order to get other children to react.

(22) J: Tää lentää täältä.  
This flies from here. [makes a circle around the spacecraft]
X: [imitates sound of aircraft]
J: Täältä lentää.  
(It) flies from here.
X: Mm.  
Mm. [agreeing]

Rhetorical questions are also employed in order to win the attention of others. In accordance with the nature of such rhetorical questions the listener is not necessarily expected to provide any response. Nevertheless, replies are sometimes made. Most commonly, however, the child who puts a rhetorical question will check that all his listeners are indeed paying attention and will then supply the answer himself. This is seen in example 23. Certain children seem to put rhetorical questions to frequent use, as does, for example, Juha in my own material.

(23) J: Ompa sopiva tie. Mitä mitä tuos on eellä? Pittääko pomppia?  
(This) is indeed a suitable road. What is in front there? Must (it) bounce? It should bounce, bounce, bounce.
Oh dear! [the object bounces onto the sand]
Drawing attention also may serve the purpose of defining the borders of a current discourse and introducing the theme for a new one. This particular function is usually aided by the child clearly stressing his utterance.

(24) J: No niin lähtään.
   OK! [go + passive]
   OK! Let’s go!

(25) J: No niin kaikki kyytiin.
   OK! All aboard! [into the lego rocket]

Children sometimes use their voices in a most powerful manner in order to attract attention, often yelling out or roaring. This kind of use of voice sometimes also fulfils a humorous function.

(26) R: Tämä on –
   This is – [interrupted]
   J: Aaiiii!
   Aaiiii! [bellowing loudly]
   A: Aaiiihi! kävi hiekkaan.
   Aaiiihi! (it) went on the sand. [digging with a spade]

Children may also inquire directly whether a playmate is paying attention to what they are saying.

(27) T: Kuuleeko Raimo?
   Does Raimo hear me?
   Raimo, are you listening?
   R: Kuulen mutta minä olen lennossa vain, en ole missään muussa.
   I hear you but I am only flying, I am not anywhere else.

1.7. Supplying feedback

Children do not naturally merely initiate new adjacency pairs during verbal interactions with one another but also supply feedback. This comprises an important way of using language even during play. Through the offering of various kinds of feedback or response (see Karjalainen 1996, Dore 1979) children express disagreement, agreement, support, reply to requests for information and to accusations, react to orders etc..
According to the material of this present study, children argue quite frequently although, in truth, in a rather simple and superficial manner. In any case expressions of disagreement comprise a common form of feedback. It is also, however, very important for the child to express agreement with respect to other children around him.

(28)  A: Silläki on siivet, tuolla hirviöllä.
      It too has got wings, that monster.
      J:  Joo, niin onki.
      Yes, so it has too.

(29)  R: Tää lähtee (Tuupovaaralle).
      This leaves (for Tuupovaara).
      He’s going (to Tuupovaara).
      J:  Niin tääki.
      Yes, and this too.
      Yeah, so’s he.

It is very common for children to supply feedback simply by repeating, either in part or in total, what another has just said. In providing feedback repetition has a wide range of functions according to the particular context. (See, for example, Keenan 1977, Nurkkala 1990).

(30)  A: Nyt se, se toinen hirviö tulee tuosta minun eestä!
      Now the, the other monster comes from there in front of me!
      A: Saa opetus-, opetuksen.
      (It will) get a lesson.
      R:  - - [interrupting, unclear]
      Se saa minulta opetuksen nyt!
      It (will) get a lesson from me now!

Also non-verbal utterances, especially various types of sneering and laughing play an important role in providing feedback within conversations during play.

(31)  J:  Meikä pannee, mää panen, mää paal läääkärihatum päähäj ja sitte lähen, hihihi!
      I [meikä = I, swaggerly] put, I put the doctor’s hat on and then I leave, hihihi!
      R:  Hihhii!
      Hiihihi!
In the context of socio-dramatic play observed in the present study children did not usually talk to themselves but really directed their speech towards some other child or children. This is seen not only in the giving of but also in the demand for feedback: children seek feedback concerning their utterances even in the context of play. Children, thus, understand that feedback plays an important role within conversation. The receiving of feedback indicates to the child that the listener has indeed been listening, in other words, that the communication channel is open.

2. Playing and having fun with language

Normally developed three and four year old children appear to have already clearly acquired the means and the desire to use language in a skilful manner as material for play. They consciously use language to have fun both by themselves and together with others. Playing with language appears, however, to differ between children: some children are noticeably more eager to practise this form of activity, producing a significantly greater number of linguistic initiatives of this type than do others.

Three to four year old children at Finnish daycare centres have acquired models for playing with language from numerous sources. Firstly, language games occur in very many children’s television programmes. Similarly, language games are common in many children’s books. Furthermore, interaction between adults and children both at home and in daycare centres traditionally involves nonsense poems and nursery rhymes (see also Hasan 1989: 3 – 12) from which children acquire models for playing with language. The varied and multi-faceted language games which children play demonstrate, however, that children do not merely repeat off by heart those games they have learned but that they are also able to actively process them.

It is interesting to consider children’s language play in relation to the concept of meta-linguistic consciousness. Differing opinions as to the rate of development of meta-linguistic consciousness indicate merely that a single definition of the concept has not yet been agreed upon. Tunmer and Herriman present three different views of the development of meta-linguistic consciousness. According to the first, children are conscious of language together with its forms and functions throughout the whole period of language development. The second view describes meta-linguistic consciousness as a developmentally separate form of linguistic activity, one which appears only when mid-childhood is reached, i.e. at approximately five years. By this stage the child pos-
sesses a large fund of linguistic skills, through which his is able to deliberate over and manipulate the features of language structures. The child is also able to distinguish a text from its context as well as to extract language from its every day usage. At the same time he has the ability to direct his attention on those characteristics of language which express content. According to the third view meta-linguistic consciousness only begins to develop in connection with schooling and is chiefly a result of learning to read. (Tunmer – Herriman 1984: 17 – 35)

My own view is that meta-linguistic consciousness is an accumulative characteristic which develops together with other linguistic and cognitive skills. My understanding of this phenomenon therefore coincides most closely with the first of Tunmer and Herriman’s viewpoints as described above. Accordingly, children of different ages and stages of development represent differing levels of meta-linguistic consciousness. For example, the frequent occurrence of language play in interaction between children can be more easily explained from this standpoint. Three and four year old children become conscious in their own way of the material of language which can be employed as an independent element without reference to its situational context.

Opinions also differ concerning what is meant by language play. In some studies (e.g. Keenan 1983) the concept of sound play is put forward. This concentrates mostly on the manipulation of sounds and play with combinations of sounds. Keenan limits sound play to those utterances which the adult listener is unable to interpret as being of referential character. Also typical is that the utterance is usually followed by laughing. Often the utterance is repeated in modified form by a playmate. Words occurring in language play are selected largely on a phonological rather than a semantic basis. Thus, referential words too are chosen purely on the basis of their formal phonological characteristics. It is a source of great mirth for the child when he finds a word which fits into a chosen formal series. According to Keenan, repetition is very common in sound play. Children may repeat certain lexical units as many as fifteen times. Such repetitions may be the work of a single speaker or of two speakers contributing together. (Keenan 1983: 12 – 13)

Garvey comments that language supplies opportunities for play at many structural levels, namely, phonological, grammatical and semantic, as well as at the levels of pragmatic and functional aspects. Additionally, the processes of speech and the production of sounds and noise may also act as subjects of play. According to Garvey children play with sounds and words, as well as
engaging in social language games: spontaneous rhyming and word games, fantasy play and nonsense talk, as well as play involving pragmatic aspects of language. The most obvious form of language play is the nursery rhyme. The phonological characteristics of words appear to offer a richer source of material for spontaneous play than does grammatical form. According to Garvey’s observations, the most common way of inventing nonsense words is to create proper names which are either strange or impossible, or to devise meaningless common nouns. Most commonly, children produced nonsense talk in such a manner as if it were almost to be taken seriously. Only by adding laughter to their utterances did they demonstrate that the intention had, after all, been playful. (Garvey 1977: 28, 30 – 45)

Ely and McCabe (1994: 21) treat language play according to very wide ranging criteria. According to their understanding, language play includes, in addition to sound play, both word play and all other forms of verbal humour. I, myself, tend to define language play in a similar manner. Thus, all the above mentioned components are involved. However, in my view, they represent differing aspects and manifestations of the phenomenon. For example, a joke may be made up of a number of utterances which taken together have a certain meaning. Taken out of context the individual words contained within the joke are not in themselves humorous. On the other hand, nonsense words are independent units – lacking meaning, indeed, perhaps funny on account of their meaninglessness.

According to my own material, playing with language occurs almost entirely through the use of words or sounds while other forms of humour, such as exaggeration, are rarer. Important in the recognition of language play is that the child himself in some way indicates that he wishes to amuse the others present, in other words, a sign that the fun is intentional. My material reveals how children use non-verbal features to indicate to those listening that their type of speech has changed from a neutral style to one of language play. Such non-verbal features include facial expressions, gestures, movements and prosody. Similarly, listeners are skilled in recognising the verbal choices made, i.e. which are a part of conventional language and which are not.

The frequency of occurrence of language play shows a clear correlation with the types of situations in which they occur. For example, according to observations made by McTear (1985: 150), children used play with language most often when sitting in cars. At such moments there were no toys at hand so the children had to create their own material for amusing themselves. My study
also reveals the same phenomenon: during meal times, where the cutlery and crockery handled serve only a functional purpose, and in free conversation, in which objects are not handled at all, language play appears more frequently than in other situations. All in all, many types of language play occur. Children clearly derive great enjoyment from playing with language and readily join in language manipulation activities. They also enthusiastically acknowledge their understanding of the playful intention of the language through laughter, giggling and other feedback. Irrespective of the form employed, language play usually always breaks with the conventions of ordinary everyday speech.

According to my observations, children engaged in language play generally:
- make comical phonological modifications to existing words
- invent their own silly sounding innovations, usually consisting of single words
- use a familiar word in a strange context
- use conventionally unsuitable words
- play with syllable sequences

In addition, language play often includes playfully employed fantasy themes, exaggeration, teasing and various types of imitation and repetition. Children may also amuse one another through the use of colourful prosodic means. At this stage, however, I consider it sufficient to merely mention these phenomena without going into details.

2.1. Phonological modification

According to my observations the most common form of language play is the phonological manipulation of words. The child latches on to some pleasant sounding word and begins to modify its phoneme structure. Often the modifications produced are nonsense words, that is, they no longer possess any meaning. Very commonly, the meaning disappears in part but something of the structure of the original word remains. Often it is the first phoneme, or the first phoneme together with the final sound or sounds of the word, which form the affix or affixes in its morpheme structure.

In the proceeding examples no attempt is made to translate nonsense words. If the nonsense word is a compound word where part of the word has a meaning then this part will be translated and the original Finnish of the remainder retained. In examples 32 - 42 literal translations were considered superfluous.
It is clear that the amusement derived from a given word is augmented not only by an innovative phonological structure but also by the fact that it does not mean anything. Still increased amusement value is achieved if the child is able to introduce into a group of nonsense words a suitably out of place word. If the word is both amusing and surprising from the point of view of the context so its powers of amusement grow.

It is also possible that only the first sound of the word is modified during play. Often the word which is made the subject of language play relates to some structure (see also McTear 1985: 151 – 154) as, for example, the coordination occurring in the following example.
It is interesting how skilfully children are able to change phonemes within the structure of the word. Sometimes they appear to perceive at some level the use of alliteration. Alliteration may appear either within a given utterance or between two separate utterances.

Sometimes phonological manipulation does not arise from any conventional word as such but rather the child initiates the play using a nonsense word at the outset. The other child recognises immediately that his playmate wishes to have fun. In such situations it is, indeed, common for the reactive child to continue modifying the form of the word. Also, words which serve to continue the play are generally nonsense words. In the following example the play begins with a nonsense word, continues using nonsense words and ends with a standard word which is, nevertheless, inappropriate to the context. The choice of the correct word is probably influenced by both alliteration and word meaning.

(35) A: Tuohom päälle, kaveria päälle.
   On top of that, on top of the friend.
   T: Ja saa, kupulia.
      And gets, kupulia.
      Gets poo pupulia. Gets a bicycle.

2.2. Own innovation

Children also enthusiastically rework their existing vocabulary in order to entertain their playmates. The remodelling may take the form of adding a derivative affix to an existing word, thus rendering it amusing. Alternatively, the child may create a new compound word. The occurrence of such innovation is general amongst children, although some individuals are noticeably more innovative than others. Similarly, the age of the child also has a bearing on the rate of occurrence of such inventive activity. Not all innovations relate to having fun. A good many of them serve other pragmatic functions. The neologisms of Finnish children have been investigated by, for example, Vänttilä (1996) in her licentiate work.

The following situation taken from my material is based entirely on the creation of new and amusing compound words. The words created differ from those involving merely phonological changes insofar as they also possess meaning. This is further evidence that children remain in the same semantic field while choosing new words.
   Do you like potato(es)? I like cheese.
   T: Öhöhö.
   K: Mää tykkään potusta ja juustosta.
   I like potato(es) and cheese.
   J: Niim määkin tykkään juustosta.
   Yeah, I like cheese as well.
   K: Me ollaan juustovöitä.
   We’re cheese belts.
   A: Niim me ollaan juustopäisiä ko mei, meei syyvvä juustua.
   Yeah, we’re cheeseheaded ‘cause we, we don’t eat cheese.
   T: Niim minäki oon juustopäine.
   Yeah, I’m cheeseheaded as well.
   A: Niim määkit tykkääj juustosta.
   Yeah, I like cheese as well.
   T: Tykkää!
   (You) Like (it)!
   You have to like it.
   J: Niin siksi sää oot juustopäinen.
   Yeah, that’s why you’re a cheeseheaded.
   J: Soot omenapäinen.
   You’re appleheaded.
   T: Heheh.
   Hahah. [admiringly]
   T: Mä ööm mansikkapäinen ko mää tykkäään mansikoista.
   I’m strawberryheaded ‘cause I like strawberries.
   J: Määki, minäkin tykkään mansikasta. Moon, mansikkapää.
   I, I like strawberries as well. I’m a strawberryhead.
   K: Minä tykkään puolukasta mää oom puolukkapää.
   I like lingonberries I’m a lingonberryhead.

The above examples also how conscious children are of the opportunities provided by the compound word structure for presenting new meanings.

2.3. Familiar words in strange contexts

There have already been cases in previous examples where the child has used a familiar word in a strange context. This kind of playing with language is popular amongst children. In the following example the amusing nature of the compound word is based solely upon its unsuitability to the context and its
exaggerated character. The word functioning as the focus of the play is, in itself, not remotely comic. The proposition, on the other hand, takes on a decidedly strange meaning.

(37) J: Meijjän Tommi ossaa vaikka, meijjän Tommi ossaa syyvä, vaikka, vaikka **koulukirja**.
Our Tommi can even, our Tommi can eat even, even a **schoolbook**.

### 2.4. Conventionally unsuitable words

Very commonly occurring in the conversations of children recorded in my material is the use of words which are in some respect unsuitable or unexpected with respect to the situation in which they occur. So, for example, words referring to excrement uttered unexpectedly are intended to cause hilarity. Clearly, children are instructed not to talk about such things unless there is a genuine need and children are conscious of this convention.

(38) J: Sinäkö? (sinäkö?)
You? (you?)
T: (otatko?) Otatko ihimisiä? Hihih!
(d’you want?) D’you want (some) people? Hahah!
N: [sneering]
J: Pihimisiä.
Pihimisiä.
K: [glances at N who is an adult]
T: **Pimppiä**. [jokingly]
**Widge**! [children’s word for female genitals]
J: Pi-, [glances at N. N does not react] **pimppiä**! [glances again at N]
Wi- **wide**!
J: He.
Yeeeeeoh! [in a congratulatory tone]

In the following example the level of merriment is also raised by the fact that the unsuitable word is supplied as a part of a compound word. The combination of potato and poops causes great mirth. Here too the child providing the utterance is fully conscious of his entertaining the others present.

(39) T: Mitä tämä on?
What’s this?
A: Pottua.
Potato.
J: Pottumuusia.
   Potato mash.
K: Pottumuusia.
   Potato mash.
J: Pottukakkaa.
   Potato poops.
T: Pottukakkaa.
   Potato poops. [amusedly]

In one grouping within my study play with unsuitable words almost always occurred in such a way that Juha first said something funny and then Taina reacted to it by giggling. In the following example the amusement value of the conventionally unsuitable word is augmented by the context.

(40) J: Haloo, kaa, kakka tullee.
   Hello! p-, poo coming.
T: Jääähäähhää! [screaming with laughter]
A: ja
   and
J: Haloo, kakka siellä.
   Hello, poo there.
T: Heheheh.
   Hahahaha.
A: Mhh.

Children also find it fascinating and amusing to talk about kissing relating to adult eroticism.

(41) A: Tästä tuli automosse.
   This became a Moscwitch.
X: [singing]
J: Possee. Pussaavakoo?
   Kissing? [playfully]
X: Tästä tuli auto.
   This turned into a car.
J: Au-, ai pussaava.
   Ca-, oh! Kissing! [laughing]
X: eee, a-
J: Mosse, posse.
2.5. Play with syllable sequences

Considerations concerning children's meta-linguistic skills are usually accompanied by discussions on how children are able to recognise the syllabic structures of words. According to Hakes (1980: 32) information concerning the phoneme structure of words and syllables spoken is not yet within the grasp of four year olds. Children only attain this skill once they reach primary school age. Hakes concedes, however, that children are already aware of the syllabic structure of spoken words at an earlier stage.

Irrespective of how conscious children are of syllable structures, my own material indicates clearly that they are able to segment their speech into syllables. Indeed, my observations show that syllables are often made the focus of language play. The recognition of the boundaries between syllables is seen in numerous word games and other games based on intonation. Sometimes the grouping of syllable sequences is so fascinating to the child that the word loses its meaning in the process.

(42)  N: Katotaanko mitä täällä on?  
Shall we see what's in here?  [lifting up a lid, under which is a lego box]
T: Joo.
Yeah.
K: ( - ) leekoja.
Lego.
T: Lee- (shouting)
J: koja!
A: Lee
X: [bawling sound]
X: lee, lee, lee, lee, lee
X: lee, lee
X: koja.
X: ree-ko-ja. [rhythmically]
X: ree-ko-ja.
A: lee-ko-ja.
K: lee-ko-ja.
A: lee-ko-ja.
K: lee-ko-ja.
N: Taina, mihis sinä oot menossa?
Taina, where are you going?
T: Tännel leikkimään.
   To play over here.
J: Hei muute-
   Hey! Besid- [interrupted]
A: **lee-ko-ja**.
J: Tämä oli minu- [interrupted, bringing lego object onto the table]
   This was mi-
A: **lee-ko-ja**.
J: Meikäl on tammösä. (nostan käjet ylös)
   I've got some of these. (I'll lift hands up)
N: Minäpä käyn viemässä sen kirjan pois.
   I'm going to put that book back. [N departs]
   lee-koon -(train). lee-ko –(egg).
T: koo<-(ma).>
J: lee-koo<-(muna).>
   lee-ko –(egg).
T: lee-koo<->ja
J: lee-koo-kakka.
   lee-koo-poops.
T: lee-koo-ja.

Phoneme modifications within the syllables add colour to the play as too do varied and exaggerated prosodic features.

**Conclusion**

It is interesting to study the language used by three and four year old children in various situations and to be able to offer researchers from many areas fascinating viewpoints as a result. It is surprising how skilfully and adeptly three and four year olds are already able to exploit the elements of language according to their purpose both as an accompaniment to play and as a material for play in its own right. In language accompanying play verbal utterances generally relate to the progress of play as well as to the directing of the behaviour of playmates, commentary on fantasy related objects and actions, role speech, the dissemination of information concerning the manage-
ment and use of objects, the passing of comments of an emotional or evaluative nature, the drawing of attention and other forms of controlling conversation. Again, in language play it is most common for children to carry out comical phonological modifications to existing words, to invent themselves new and silly sounding innovations, usually compound words, to introduce familiar words in unusual contexts, to use words in a manner contradicting convention and to play with syllable sequences. Both in accompanying their play with language and in playing with language itself children are highly aware of other children and direct their messages towards these playmates. Speech is, therefore, highly interactive.

Numerous factors both in the language of play and in the play of language require still further clarification. For example, further analysis of language accompanying play would provide both qualitative and quantitative means for describing more accurately the language use of children of differing age groups and gender from a psycho-linguistic or socio-linguistic point of view. Similarly, language play could provide us with an unique opportunity to more precisely map out the degree and nature of psycho-linguistic consciousness of three and four year old children. It would also be interesting to compare how structurally differing languages offer diverging opportunities for language play.
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