Amos van Gelderen en Ron Oostdam

Learning grammatical structures for revision of form and meaning; A classroom experiment[1]

1. Introduction

Text revision is probably one of the most complex skills for writing. It depends on both linguistic and extra-linguistic skills. *Linguistic* skills are dependent on lexical, syntactic, phonologic, morphologic and orthographic knowledge of a certain language. They appear to be essential, because manipulating linguistic units within and between sentences is the most obvious - and most observable - aspect of revision activities. By *extra-linguistic skills* we refer to conceptual knowledge, metacognition, discourse knowledge and topic knowledge relevant to the writing task. Some influential models of revision (cf. Bereiter & Scardamalia, 1987; Flower, Hayes, Carey, Schriver & Stratman, 1986) stress extra-linguistic aspects, focusing on cognitive processes like comparison, diagnosis and operation. Linguistic skills that are needed to carry out these processes successfully are not specified in these models. We focus on revision from a *communicative perspective*: producing text that is comprehensible to the readership. The importance of extra-linguistic skills in this context is evident. Nevertheless also linguistic skills are at stake here. We may assume that all the above-mentioned aspects are at work in producing comprehensible text.

In this contribution we address the revision processes of young, inexperienced writers and describe results of an experiment aimed at facilitating these processes in an educational context. We focus upon the way *linguistic fluency* determines the revision process on both the level of meaning and form. In our research improving linguistic fluency is just an instrument for allowing children to solve *meaning* related problems and creating comprehensible text. Thereby we assume that working memory limitations play an important role in revision skill. Improving linguistic fluency frees working memory space and allows the writer to devote more attention to meaning related problems in reformulation (cf. Mc Cutchen, 1996; McCutchen, Covill, Hoyne & Mildes, 1994; Kellogg, 1996; Grabe, 2001; Gelderen & Oostdam, submitted; Snellings, Van Gelderen & De Glopper, submitted). Therefore we explore ways of improving linguistic fluency that are generated in contemporary discussions about mother tongue (L1) and second language (L2) learning. Central issues in this discussion are the role of explicit and implicit learning of linguistic regularities and the implications for focus on form and meaning in language education.

The following results are based upon a preliminary analysis.We believe that publicizing the first results of our experiment helps to shape the educational debates around the form/meaning issue for learning L1- and L2- linguistic skills (cf. Doughty & Williams, 1998; Kroon & Vallen, 1996; Long, 1998). Lately, discussions about the so-called task-based approach with its strong focus on meaning have been introduced in the Dutch speaking community. One of the most active players in this field is the *Steunpunt NT2* at Leuven striving towards the development of curricula for primary and secondary education based on the concept of task-based learning. We think that our preliminary results can contribute to the clarification of methodological issues (how to shape educational conditions and how to study their effects) and to the formulation of realistic expectations of experimental effects. Because of the international relevance of the topic this article is published in English.

2. Revisions of inexperienced writers

In previous studies into elementary students' revision skills it has been found that these students (and also older students) almost exclusively revise in order to correct errors of linguistic *form*: spelling, punctuation, syntax or idiom (cf. Fitzgerald, 1987; Flower, Hayes, Carey, Schriver & Stratman, 1986; National Assessment of Educational Progress, 1977; Nold, 1981). Rethinking and rephrasing the *meaning* of what is being communicated seems to be absent in these students' revision process. Somehow this observation is surprising, given that children's awareness of the *meaning* of text presumably is developmentally primary to their awareness of *forms* (cf. Galambos & Goldin-Meadow, 1990). Moreover models of the writing process generally assume that meaning related processes, like idea generation, organisation and selection, have priority over linguistic processes, like lexical selection and syntactic structuring (cf. Hayes & Flower, 1980; Bereiter & Scardamalia, 1987; Hayes, 1996; Kellogg, 1996).

There are several explanations for the absence of revision on the level of meaning communicated. One is Bereiter and Scardamalia's (1987) description of knowledge telling as the basic process of composition of inexperienced writers. In short, the process consists of the separate generation of an idea for each following sentence of a text, thereby producing rather isolated sentences that contain little, communicatively relevant information and have poor coherence (see also McCutchen & Perfetti, 1982). Knowledge telling is a result of the absence of reactions of a live interaction partner. In the conversational situation in which text production originates, the partner provides the necessary signals for elaborating on, improving or correcting text already produced. In the typical writing situation at school there is no substitute for this kind of cuing so communicative problems may pass completely undetected.

Some other explanations for the absence of revision on the level of meaning can be added to the 'knowledge telling' explanation. Van Gelderen (1997) quotes Garner's (1990) analysis of the reasons children have for not using strategies that

are potentially available to them. He mentions several explanations. Important factors for successful meaning-related revision are the ability to comprehend text adequately, awareness of meaning-level problems and checking reformulations. All of these explanations focus on extra-linguistic aspects of revision skill. Children are not sufficiently attentive to *meaning related problems* in the text they are producing. But *linguistic* problems that children have in manipulating words in sentences can also play an important role, especially when a communicative problem has been detected and the child is trying to solve it by changing words and structures.

A central problem in revision from a communicative point of view is the integration of linguistic and extra-linguistic resources in reformulation. Writers have to keep in mind the knowledge they have of their subject, what they want to communicate, who they want to communicate to and what they know about that person(s). At the same time they have to manipulate words, sentences and their syntactic, semantic and pragmatic implications in order to express their ideas correctly and appropriately. It is rather likely that such complex integration leads to cognitive overload, especially in the case of inexperienced writers. Flower and Hayes (1980) speak in this context of *juggling constraints*.

3. Fluency in spoken and written language

Kellogg (1996) developed and tested a model in which working memory capacity restricts what writers can and cannot do. The load placed on working memory by lexical and syntactic decisions in (re)formulation can thus prevent non-fluent writers to focus on meaning communicated (cf. Chenoweth & Hayes, 2001; McCutchen, Covill, Hoyne & Mildes, 1994; McCutchen, 1996). The linguistic constraints in writing are in many ways new to inexperienced writers. Though they can be fluent in *spoken* discourse - and many of them are - expressing their thoughts in written form deprives them of many instruments that they normally use to convey meaning in interaction: gestures, personal and physical contact, intonation, pauses, redundant formulation, 'lax' syntax and self-repairs (cf. Chafe, 1986; Levelt, 1989; Van Gelderen, 1994). The contrast with written communication is large indeed. Personalized aspects of communication are absent in most writing situations; prosodic instruments are not available; lexical and syntactic constraints are much tighter than in spoken discourse and self-repairs must be made invisible to the readership. The conciseness of written language is the result of the extra-linguistic context of most writing situations. Requirements like preciseness, clarity, and depersonalisation severely constraint the linguistic form that written texts take. This form must be a simplification and densification of the richness of oral communication. To avoid misunderstandings the writer must be much more cautious than the speaker. Lacking the non-verbal and prosodic ways of communication and lacking possibilities for redundancy and overt repair, utterances on paper may become ambiguous in unexpected ways. Each single lexical decision might have diverse consequences for the way the text will be interpreted by the reader. Therefore each word is a potential candidate for conscious attention and revision.

Fluent writers are supposed to relieve the burden of this task by using automated (or proceduralized) processes for formulation and evaluation of relatively large chunks of language (Chenoweth & Hayes, 2001; Anderson, 1995). Children, being non-fluent writers, thus may restrict attention to the forms of the language in order to prevent working memory to be exhausted.

In accordance with other studies we define linguistic fluency as the ability to produce language in a fast rate (Schmidt, 1992). Fluency is being distinguished from *language proficiency*, because in the latter also aspects of syntactic correctness, coherence and appropriateness are included. Although correct usage of language is not our criterion for fluency some quality criteria do apply. According to us lexical richness and variability of word combinations are also aspects of fluency. We assume that these aspects - although they might be less important in oral communication (cf. Van Gelderen, 1994) - are important in writing and especially in revision. For successful revision it is essential that the writer can choose from a rich resource of lexical entries and syntactic structures in order to actually improve drafts. In the writing process fluency may not be a directly observable aspect of behavior. Fluent writers do not have to write fast. Fluency in writing simply means that a great number of words and syntactic structures are efficiently accessed (cf. Chenoweth & Hayes, 2001). In other words fluency indicates the *accessibility* and *retrievability* of linguistic knowledge.

4. Facilitating linguistic fluency by focus on form and meaning

As our interest now is in improvement of linguistic fluency, we want to explore ways in which this can be done according to theories of the role of linguistic knowledge in L1 and L2 learning. One of the most debated topics in the last century is the role of linguistic awareness in language learning. Both in school practice and in scientific discourse about the conditions for a good language curriculum 'grammar' has been one of the most debated topics. More than half of the previous century the teaching of grammar was generally regarded as a hallmark of good practice for language education, no matter who the learners were (children, adolescents, adults) or what the learning was about (L1, L2 or a foreign language). From the seventies on, a more critical attitude towards so-called traditional grammar grew amongst educationalists, both from a pedagogic and a linguistic point of view. In mother tongue education there were debates questioning the relation between subject matter of grammar education and the communicative skills that students' actually had to learn. Also the fundamental question was raised whether explicit knowledge about sentence structure is necessary for understanding and producing grammatical utterances. From the point of view of second language acquisition Krashen (1982) put forward the idea that all that is necessary for successful L2-acquisition is meaningful communication in the L2 (see also Robinson, 1997). Any focus on formal aspects of the language was considered non-productive by Krashen, because this kind of explicit knowledge has no relation with actual usage and does

not transfer to communicative skill. Therefore a *focus on meaning* was stressed by Krashen (1981) and his followers as the main factor for successful (second) language acquisition. This was a dominating theme in L2-theory and practice during the eighties and part of the nineties of the previous century. Lately a counter-movement set in, proposing that a *focus on form* is a key factor for successful L2-learning (cf. Long, 1991; Doughty & Williams, 1998; Norris & Ortega, 2000). According to this view learners will keep on making the same mistakes over and over again if formal aspects of L2 are systematically being neglected. Focus on form (not formS, like Long insists to discriminate it from the tradionalist view on grammar) means that the attention in the classroom mainly stays on the level of communicative meaning, but that at the same time learners are confronted with some form related issues that are supposed to be at their level.

The previous discussion makes clear that awareness of linguistic form can be an important condition for acquisition of certain structures and thus for aspects of linguistic fluency. On the other hand it is still debated how important this awareness is in the context of communicative language learning in general (cf. Ellis, 1994). *Noticing* of linguistic forms seems to be an important factor (Schmidt, 1993). It might also be that many linguistic structures are learned without conscious noticing, while learners are solely focused on meaning. This can be seen as 'pure' *implicit* learning. But it can also be the case that noticing specific linguistic structures is essential for learning, so that students must be (explicitly) confronted with these forms. This is a sort of *explicit* learning directed to form, but focus on meaning still dominates. Furthermore there is discussion about the role of explicit knowledge of linguistic *rules*. In several experiments in the field of artificial grammar Reber (1967, 1989) showed that implicit learning of rules was often at least as effective for grammaticality judgements as explicit learning. There are studies indicating that the effect of explicit knowledge of rules on linguistic fluency depends upon the *complexity* of the rules in question (cf. Reber, 1989; De Keyzer, 1995; Robinson, 1996). Explicit learning of rules goes one step beyond simple noticing by using explanations or generalizations of certain linguistic structures.

The theoretical debate about the role of awareness of linguistic forms and knowledge of linguistic rules has made it clear that there are no simple answers to questions like the following. Is it better to learn language and its usage by mere exposure to as much meaningful input as possible, or should explicit noticing and/or knowledge of rules accompany this input?

	Explicitness of instruction	
Focus of learner attention	**Implicit** instruction of linguistic structures with attention to **linguistic forms**	**Explicit** instruction of linguistic structures with attention to **linguistic forms**
	Implicit instruction of linguistic structures with attention to **meaning**	**Explicit** instruction of linguistic structures with attention to **meaning**

Figure 1: Two dimensions for facilitating linguistic fluency

In discussions about *writing* education the same questions have been raised into the role of teaching explicit rules for language use (cf. Hillocks, 1984; Gelderen, Couzijn & Hendriks, 2000). In the case of revision it is relevant too. For successful revision it is necessary that linguistic errors are detected, diagnosed and corrected with some certainty. Explicit knowledge of rules can help the inexperienced writer in carrying out these processes. On the other hand some revision processes might be carried out more efficiently, drawing on implicit knowledge of sentence structure, especially when explicit rules are hard to apply. Two dimensions of instruction are at stake here that can have an independent effect on learning outcomes. The first dimension we might call 'focus of learner attention'. The second we call 'explicitness of instruction'. In Figure 1 these two dimensions are being depicted.

5. An experimental approach

An important question now is what kind of training of linguistic fluency actually facilitates writing and revision skills. This question has not been addressed experimentally yet. We are planning on a series of experiments on different domains of linguistic knowledge: formal, semantic and pragmatic. Following is a description of the experimental design that we are applying. The first experiment aims at improving linguistic fluency for revision focusing on form or meaning. Furthermore we manipulated the explicitness of instruction, as defined in Figure 1. For both levels of revision we distinguish implicit instruction and explicit instruction of linguistic structure. As a result four experimental conditions have been defined in the same way as depicted in Figure 1.

In all conditions linguistic structures are being presented in the same meaningful texts. The exercises are systematically ordered from receptive (detect and diagnose) to productive (operate). In the conditions in which learner attention is being focused on forms, assignments require that linguistic structures are at least being *noticed.* In the meaning conditions, however such noticing is not required. Instead learner attention is directed to meaning level problems in the texts. The explicit learning conditions supply explicit rules for dealing with the structures that are the objective

of the lessons. These rules give some meta-linguistic terminology for discussing the structural phenomena and explain how to use the structures correctly in formulation.

The first experiment consists of four lessons and is directed to students in grades 5 and 6 (ages 10-12). The objectives are subsequently: deleting and adding information in sentences, adding relative clauses to main clauses, combining sentences and using anaphora. In Appendix 1 a schematic overview is given of the beginning of lesson 1, in the four conditions.

Outcome measures are two revision tasks. In the first task children have to detect and solve problems, directly related to the objectives of the lessons. The text was made in such a way that these problems were richly represented. In the second task a step further towards 'normal' writing was taken. In this task students had to take information from several sentences and translate them into continuous text. Also in this task students have to apply linguistic knowledge that has been addressed in the experimental lessons.

Here we present preliminary analyses of the effect of our experiment on only the first revision task. The short time period between the execution of the experiment (April 2001) and the preparation of this manuscript did only allow for such a preliminary and partial analysis.

6. Method

Design

The experiment uses an experimental pretest-posttest-control group design, with randomized assignment of children within a classroom to the four experimental conditions. The control group consisted of two classrooms (one from grade 5 and one from grade 6) with a composition in terms of language background comparable to the classrooms from which the experimental children were recruited.

Subjects

In total 247 children (130 boys and 112 girls) from grades 5 and 6 divided over 11 classrooms from five different elementary schools in Amsterdam and wide surroundings participated in the study. Most children were 11 or 12 years (N=198). There were 25 students of 10 years, 19 students of 13 years and 1 student of 14. All classrooms were selected on the basis of having a rather large percentage of children from minority groups, mostly of Moroccan, Turkish or Surinam origin. Only data from children that had followed all years of elementary education in the Netherlands and without learning disabilities will be considered. We are aiming at L1-learners and advanced L2-learners of Dutch. In the present situation of Dutch schools this is by far the majority of students. Beginning L2-learners are rather rare in classrooms for grades 5 and 6. Moreover the grammatical issues in our experimental lessons are far beyond the level of beginning L2-learners, because they have insufficient knowledge of the structure of simple Dutch sentences.

Treatment

The issues in the lessons have been selected from classroom materials in use in the Netherlands and Flanders for grades 5-6. The lessons in this experiment are directed to *formal* aspects of sentence construction, dealing with several means for adding and deleting information in sentences. All conditions consist of revision-like exercises in order to make sentences in text richer in information, and to avoid unnecessary repetition of information. In all exercises children had to read whole texts, presented in a meaningful context. There are four lessons. Per lesson the following subjects are dealt with:

1. adding commentary to parts of a sentence (kernels)
   [The *handsome* boy *with the black hair* has the *red* ball *that Ilse is looking for.*]
2. adding relative clauses to main clauses
   [The ball, *that Paul is looking for*, is in the pond.]
3. combining sentences
   [The teacher wears a *beautiful, warm* coat. Instead of: The teacher wears a coat. It is beautiful and warm.]
4. using anaphora
   [He goes to Australia for a holiday. I would like to do *that* too.]
   [Paul and Mary have worked all day. Now *they* are tired.]

The four lessons have been designed for each experimental condition in close collaboration with professional text writers of materials for elementary education. Per lesson each student received a *work book* containing the texts and exercises (also the explanation of rules for the explicit conditions) and a booklet containing the answers to the assignments (the *answer book*). The students had to use this for checking their own answers.

The receptive exercises all had a multiple choice answering format, making it easy for the students to check. The productive exercises had more open formats, but the answer book contained the most obvious answers. When students had different answers, they were encouraged to ask the assistant.

Each lesson ended with a reflective assignment consisting of two parts: 1) multiple choice questions about specific topics in the lesson (e.g. "Can you add interesting information to sentences?" alternatives: yes, always / it depends / no, never / I don't know), 2) a question about what was the most important thing that the students had learned in the lesson (admitting several answers and also an open answer).

Procedure

Each lesson lasted 45 minutes and was immediately followed by a ten-minute direct measure (see Table 1). The experiment (pretest, lessons and posttest) was spread over a period of 3-4 weeks. In most classes these weeks were consecutive. In one class there was an intermission of one week holiday between lessons 3 and 4.

Pretest Grammatical Knowledge	Lesson 1 & direct measure 1	Lesson 2 & direct measure 2	Lesson 3 & direct measure 3	Lesson 4 & direct measure 4	Posttest 2 Revision tasks
Experimental groups & Control group	Experimental groups	Experimental groups	Experimental groups	Experimental groups	Experimental groups & Control group

Table 1: Experimental agenda

Classroom wide instruction was not possible, because students of the four experimental conditions were working in the same classroom. Students were grouped according to the condition to which they were assigned and worked individually through their booklets. Two trained assistants (from a team of 6 assistants) supervised the four groups in each class. One assisted children in the form-conditions when they asked for help, the other assisted children in the meaning-conditions. Children rather quickly got used to this sort of independent work. Their calls for assistance in interpreting instructions or answers for exercises markedly decreased in the course of the four lessons. Furthermore the assistants' task was to make sure that students worked properly and did not for example consult the answer book before they finished an exercise. Also it was considered important that children seriously checked their answers with the answer book, counted the amount of correct answers and asked for assistance when they did not understand why a given answer was incorrect.

Measures

A short questionnaire was administered to probe the *language background* of the participating students. Other measures in the experiment were: a) a pretest for grammatical knowledge (to be used as a covariate), b) direct measures for knowledge of rules and application of knowledge from each of the four lessons, and c) two posttest revision tasks in which transfer of the lessons to a more complex sort of revision is measured.

The pretest Grammatical Knowledge

A pretest was administered to measure children's relevant grammatical knowledge in view of the contents of the lessons. Some advance knowledge of the following five subjects seems important in determining how much children profit from the experimental treatment:

1. gender of article (choose the correct article);
2. sentence concept (discriminate a complete sentence from an incomplete one);
3. word order in main and subordinate clauses (discriminate correct from incorrect orders);
4. cutting sentences (which parts of a sentence can and cannot be separated);

5. using conjunctions (discriminating sentences in which conjunctions are used correctly or incorrectly).

The test consists of a 100 two-choice questions, 20 items per subject.

The posttest Revision Task 1

We will only describe the first revision task, because this is the only one for which results have yet been analyzed. In this task children revise a given text in which information is given in an overly redundant way (see Appendix 2). The text consists of five paragraphs that have to be rewritten separately. The children are asked to remove all unnecessary repetitions in order to make the text more pleasant to read. In doing so the children have to use operations like the ones that were practiced in the lessons (adding commentary or relative clauses, combining sentences and using anaphora). However, (productive) exercises in the lessons were always *more structured* and *less elaborate* than this revision task.

Scoring

Our preliminary analysis is aimed at the content level of the revised texts. We were interested in the question whether the children had learned to preserve all important information (focus on meaning), while at the same time they were able to repair all unnecessary repetitions. Syntactic errors and involuntary deletions of words that can easily be guessed from the context are neglected in this stage of analysis.

Content elements (CE) are pieces of information that are considered important given the communicative purpose of the text. Each CE has been circumscribed by a phrase derived from the text. The first CE for example was circumscribed as "there is a problem". There were 20 CEs for the whole text.

Unnecessary repetitions (UR) are content words or phrases in the text that are being repeated (almost) literally, while there is no information being added and it can be said in a shorter way. URs make text unpleasant to read. Sometimes they suggest that something new is being said or accentuated, while this is not intended. A prescription has been developed for scoring URs in this task.

Inter rater agreement

Three raters scored CEs and URs in portions of the rewritten texts after a brief training period. Each pair of raters scored some twenty texts, working independently, to determine inter rater agreement. The agreement for CE was high. In both cases (rater 1/rater 2; rater 1/rater 3) the correlation between the scores was in the high nineties (.93 - .98). The agreement for UR however was lower. In some cases it appeared that raters became more severe than they had begun (i.e. they counted more URs the longer they were scoring). To counteract this undesired rater effect more stringent rules were set for some frequently returning phrases in the children's texts. For example "Do you know someone... If you know someone" was always counted as *one* UR, despite the fact that both "someone" and "you know" are being unnecessarily repeated. On the other hand "...will not be send home any more. If they will not be send home any more..." was always counted as *two* URs because both "home" and "will not be send anymore" are being unnecessarily

repeated and can be separately avoided. The more stringent rules guarantee a fairer scoring between different texts. When the raters' scores where corrected using these rules, inter rater agreement rose to a correlation of .97 - .99. All texts were corrected using the more stringent rules. The high inter rater agreements for CE and UR indicate that these aspects have been consistently and reliably scored.

7. Results

Language Background

Four questions were asked about students' language background. Results of these questions are depicted in the table below.

	Dutch	Another language	Bilingual
Home language	56	38	5
Language with mother	48	49	3
Language with father	51	46	3
First language	55	42	3

Table 2: Percentages of students in the sample indicating language background

From Table 2 it is clear that almost half of our sample is from an L2 or bilingual language background. One question was asked about the nation of birth. 81 percent of the children was born in the Netherlands; 19 percent was born in another country. No significant differences between the experimental and control groups were found qua language background and nation of birth.

Descriptive statistics

Results of the pretest and posttest measures used in this preliminary analysis are presented in Table 3. First data of four of the 247 children were removed, because they dropped out during the experiment and/or their Dutch proficiency was of a too low level to meet the requirements for the experiment (see above). Nine children did not do the revision task, because they were absent at the time of administration and could not do it at a later time.

For the following analysis the pretest measuring grammatical knowledge was screened in order to ensure its reliability. Fifteen out of the hundred items of the pretest were deleted because of poor item-rest correlations. Most of these deleted items appeared to be too difficult for the students. Especially items that required recognition of a correct use of gender-specific anaphoric conjunctions in subordinate clauses (like: *that, which and who*) had very low p-values and lowered test-reliability.

The mean score for the test of grammatical knowledge indicates that the test is of moderate difficulty for the students, the maximum score being 85. Given the fact

that the items were of a two-choice format, pure guessing would yield an average score of about 43. The mean score for CE in the revision task must be related to the maximum score of 20. It can be concluded that many children preserve most of the important CEs in their rewriting. On the other hand there are some children that do not. Some of them do not even reproduce *one* of the CEs originally in the text and a substantial group (N=33) produce only half of the CEs or less. The mean score for UR must be related to the URs in the original text (27). So we can conclude that on average the children succeeded in avoiding most of the URs in their revised text. The reliabilities (Cronbach's alpha) for the three measures are satisfactory. The reliabilities for CE and UR are calculated by taking the scores per paragraph as one item of the test. Therefore there are 5 items for these measures in the table.

	Mean	Standard deviation	Reliability	N of subjects
Pretest				
Grammatical Knowledge	65.04	8.51	.82 (k=85)	243
Posttest				
Revision task (CE)	14.88	4.87	.85 (k=5)	234
Revision task (UR)	7.37	4.30	.77 (k=5)	234

Table 3: Means, standard deviations, reliabilities and number of subjects for pretest and posttest measures

Experimental effect

For the analysis of experimental effects we selected children that scored *more than half* of the content elements for the revision task. This was done to exclude children that did not produce text according to the assignment, making their text incomparable with the other texts. 201 of the 234 children matched our criterion.

We conducted a MANCOVA with two independent factors (condition and grade), two dependent variables (CE and UR) and a covariate (grammatical knowledge). Results of the analysis are given in Appendix 3 and Table 4. The correlations between the covariate (grammatical knowledge) and the dependent variables are rather low (.12 for CE and - .23 for UR). Because low correlations have a negative effect on power in covariance analysis, we also carried out a MANOVA. Results of both analyses lead to the same conclusions. Here we present the results of the MANCOVA only.

There is a main effect of condition on both CE and UR scores (F=3.55 and 5.63 respectively; p= .008 and .000). There are no significant effects of grade and there is no significant interaction. Post-hoc analysis of the condition effect reveals that only the differences between the control group and the experimental groups are significantly different. For CE all differences between the control group and conditions 1-2 are significant at the .05 level. The difference between control and conditions 3 and 4 (explicit/meaning) are not significant. For UR all differences between the

control group and the conditions 1-4 are significant (p-values are smaller than or equal to .004). In Table 4 the mean CE and UR, corrected for the covariate, grammatical knowledge, are depicted. From this table it appears that the students of the four experimental groups have performed better on CE and UR than the control group.

We also tested the assumption that students in the experimental conditions had a better *resolution* of the *trade-off* between content elements and unnecessary repetitions. According to our assumptions a better mastery of the linguistic techniques for avoiding repetitions results in more attention for meaning related aspects of the revision task and therefore in a better preservation of important elements in a text. However, there is a significant positive correlation between the two dependent variables (r=.26), indicating that producing fewer content elements reduces the risk of unnecessary repetitions. Therefore it is worthwile to investigate to what degree students succeeded in preserving important content elements while at the same time deleting linguistic repetitions. We measured the way in which the trade-off between CE and UR is being resolved by standardizing the scores and subtracting the UR scores from the CE scores. An ANCOVA (with condition and grade as independent factors, the trade-off score as dependent variable and grammatical knowledge as covariate) reveals that there is again a main effect of condition (F= 13,83, p= .000) and no significant effect of grade, nor a significant interaction. All differences between the control group and the four experimental groups are significant in favor of the experimental groups (p-values smaller than .000). The differences between the four experimental groups in the post-hoc analysis are still not significant.

Condition	CE mean	CE s.e.	UR mean	UR s.e.	N
1. Implicit/forms	16.83	.34	7.57	.70	43
2. Explicit/forms	16.66	.35	7.49	.72	40
3. Implicit/meaning	16.50	.35	7.57	.73	42
4. Explicit/meaning	16.13	.33	6.85	.70	44
5. Control	15.07	.39	11.49	.81	32

Table 4: Means and standard errors of CE an UR for the five conditions, controlled for grammatical knowledge

8. Discussion

This report is a preliminary account of a classroom experiment aimed at facilitating revision skills by promoting linguistic fluency in four distinct conditions. The conditions vary along the dimensions explicitness of instruction (explicit vs. implicit

instruction of rules) and learner attention (focus on forms or meaning). At this stage we are not in the position to make a definite evaluation of the effects of our experiment. First other measures have yet to be analyzed (like the direct measures for skills and knowledge after each lesson and the second revision task). Second, also on the first revision task the analysis is incomplete and focuses only on meaning related outcomes, leaving aside the syntactic qualities of the students' texts.

If we confine ourselves to these preliminary results we must conclude, however, that there are clear learning results of all four experimental conditions: implicit/form; explicit/form; implicit/meaning and explicit/meaning. In comparison to a control group that received no experimental training in (receptive and productive) revision skill the students in the experimental groups obtained significantly better scores on the posttest revision task (specifically: the avoidance of unnecessary repetitions and the trade-off between number of content elements and amount of unnecessary repetitions). These results suggest transfer of the training (in which revision was restricted to some words or sentences in a text) to a more elaborate revision task (in which a whole text has to be revised and the communicative purpose is more explicit). On the other hand there are no differences found *between* the four experimental groups. This result suggests that focus of learners' attention and explicitness of instruction do not really matter in determining the learning process when only revision on the meaning level is taken into consideration. It is possible that it suffices to confront students with examples of texts in which the length of sentences and the use of certain structures are being manipulated. This would mean that the children already learn to manipulate structures in revision, solely on the basis of repetitive exercise. The fact that the condition implicit/meaning produced equivalent results to the other conditions suggests that even stimulation of *noticing* linguistic forms is not necessary for learning how to add information to sentences and avoid redundancy. The fact that the two explicit conditions did not result in better performance of the children can be interpreted as a failure to transmit the knowledge of linguistic rules effectively. This interpretation has yet to be checked with the results of the direct measures after each lesson. Assuming however that the children have actually acquired the intended knowledge of the rules, this means that such knowledge did not help them in the revision task on the level of meaning (i.e. there was no transfer). Nevertheless it is still possible that the explicit knowledge helps in relation to the syntactic correctness of their revisions. A remarkable finding is also the complete absence of (main or interaction) grade-effects. Apparently the selected learning material was equally suitable for both grade levels. Of course we selected these materials from textbooks for these levels, but it is not self-evident that they profit equally.

In the context of our research, improving linguistic fluency is not the aim, but the instrument for revision on the level of meaning. We believe that working memory can be seriously hampered when linguistic processing is not sufficiently automated. In this perspective we regard the results of the first experiment as very promising. All experimental conditions appear to improve linguistic fluency and facilitate revisions on the level of meaning of the text. The fact that the explicit instruction does not add to this effect and that the form-conditions do not out-

perform the meaning-conditions seems to favor the implicit/meaning condition as the most parsimonious way of improving linguistic fluency. In this condition the learner attention does not have to be distracted by rather abstract explanations of linguistic forms (with accompanying meta-language) and they can fully concentrate on text meanings, an attitude that writers would normally take to a text.

In next experiments we intend to address other domains of linguistic knowledge than the syntactic construction of sentences. We have to consider the possibility that several linguistic variables play a role in the effectiveness of the lessons. For each domain of linguistic knowledge (on the level of syntax, lexis, morphology or pragmatic aspects of usage) variables can be discriminated that may be important, such as rule governedness, difficulty of explicit rules, frequency and acquisition order. For example it seems plausible that knowledge that has been acquired in an early phase of acquisition is not influenced by exercises at a relative late stage of development, thus that sort of knowledge is an unlikely candidate for (fluency-) training for L1- and advanced L2-learners in grades 5 and 6. The ongoing experimental studies are not only directed at the effectiveness of the four distinguished learning conditions for revision, but also at the unraveling of the interaction between learning conditions and the above mentioned linguistic variables.

Note

1. This article is based upon a paper presented at the symposium on Revision of Form and Meaning in Written Language Production, of the EARLI 2001 conference on August 31.

Bibliography

Anderson, J. (1995). *Learning and memory: an integrated approach.* New York: John Wiley.

Bereiter, C. & M. Scardamalia (1987). *The psychology of written composition.* Hillsdale, NJ: Lawrence Erlbaum.

Chafe, W. (1986).Writing in the perspective of speaking. In: C. Cooper & S. Greenbaum, (Eds.), *Studying Writing: Linguistic Approaches.* Beverly Hills, Cal.: Sage.

Chenoweth, N. & J. Hayes (2001). Fluency in writing. Generating text in L1 and L2. *Written Communication* 18, 1, 80-98.

De Keyzer, R. (1995). Learning second language grammar rules: an experiment with a miniature linguistic system. *Studies in Second Language Acquistion* 17, 3, 379-410.

Doughty, C. & J. Williams (1998). *Focus on form in classroom second language acquisition.* Cambridge: Cambridge University Press.

Ellis, N. (1994). *Implicit and explicit learning of language.* London: Academic Press.

Fitzgerald, J. (1987). Research on revision in writing. *Review of Educational Research* 57, 481-506.

Flower, L. & J. Hayes (1980). The dynamics of composing: making plans and juggling constraints. In: L. Gregg & E. Steinberg (Eds.), *Cognitive processes in writing.* Hillsdale, NJ: Lawrence Erlbaum.

Flower, L., J. Hayes, L. Carey, K. Schriver & J. Stratman (1986). Detection, Diagnosis, and the Strategies of Revision. *College Composition and Communication* 37, 1, 16-55.
Galambos, S. & S. Goldin-Meadow (1990). The effects of learning two languages on levels of metalinguistic awareness. *Cognition* 34, 1-56.
Garner, R. (1990). When children and adults do not use learning strategies: toward a theory of settings. *Review of Educational Research* 60, 4, 517-529.
Gelderen, A. van (1994). Prediction of global ratings of fluency and delivery in narrative discourse by linguistic and phonetic measures - oral performances of students aged 11-12 years. *Language Testing* 11, 3, 291-319.
Gelderen, A. van (1997). Elementary students' skills in revising; integrating quantitative and qualitative analysis. *Written Communication* 14, 3, 360-397.
Gelderen, A. van, M. Couzijn & T. Hendriks (2000). Language awareness in the Dutch mother-tongue curriculum. In: L. White, B. Maylath, A. Adams & M. Couzijn. *Language Awareness: a history and implementations*. Amsterdam: AUP, 57-88.
Gelderen, A. van & R. Oostdam (submitted). Revision of form and meaning in learning to write comprehensible text.
Grabe, W. (2001). Notes toward a theory of second language writing. In: T. Silva & P. Matsuda (Eds.), *On second language writing*. London: Lawrence Erlbaum, 39-58.
Hayes, J. (1996). A new framework for understanding cognition and affect in writing. In: C. M. Levy & S. Ransdell (Eds.), *The Science of Writing*. Mahwah, NJ: Lawrence Erlbaum Associates, 1-27.
Hayes, J. & L. Flower (1980). Identifying the organization of writing processes. In: L. Gregg & E. Steinberg (Eds.), *Cognitive processes in writing*. Hillsdale, NJ: Lawrence Erlbaum Associates, 3-30.
Hillocks, G. (1984). What works in teaching composition: a meta-analysis of experimental treatment studies. *American Journal of Education*. 133-170.
Kellogg, R. (1996). A model of working memory in writing. In: C. Levy & S. Ransdell (Eds.), *The science of writing: Theories, methods, individual differences and applications*. Mahwah, NJ: Lawrence Erlbaum Associates, 57-71.
Krashen, S. (1981). *Second language acquisition and second language learning*. Oxford: Oxford University Press.
Krashen, S. (1982). *Principles and practice in second language acquisition*. Oxford: Pergamon
Kroon, S. & T. Vallen (1996). *Het verschil voorbij; onderwijs Nederlands als eerste en tweede taal in Nederland en Vlaanderen*. (Voorzetten 51, Nederlandse Taalunie). Sdu: Den Haag
Levelt, W. (1989). *Speaking. From intention to articulation.* Cambridge MA: MIT press.
Long, M. (1991). Focus on form: a design feature in language teaching methodology. In: K. de Bot, R. Ginsberg & C. Kramsch (Eds.), *Foreign language research in cross-cultural perspective*. Cambridge: Cambridge University Press, 196-221.
Long M. (1998). Focus on form in task-based language teaching. *ESL*, 16, 2. University of Hawaii Working Papers, 35-49.
McCutchen, D. (1996). A capacity theory of writing: Working memory in composition. *Educational Psychology Review* 8, 3, 299-325.
McCutchen, D., A. Covill, S. Hoyne & K. Mildes (1994). Individual differences in writing: Implications of translating fluency. *Journal of Educational Psychology* 86, 2, 256-266.
McCutchen, D. & C. Perfetti (1982). Coherence and connectedness in the development of discourse production. *Text* 2, 113-39.

National Assessment of Educational Progress (1977).Write/rewrite: an assessment of revision skills: selected results from the second national assessment of writing. U.S. Government Printing Office; EDRS ED 196043.

Nold, E. (1981). Revising. In: C. Frederiksen & J. Dominic (Eds), *Writing: the nature, development and teaching of written communication* (Vol. 2). Hillsdale, NJ: Lawrence Erlbaum.

Norris, J., L. Ortega, (2000). Effectiveness of L2 instruction: a research synthesis and quantitative meta-analysis. *Language Learning* 50, 3, 417-528.

Reber, A. (1967). Implicit learning of artificial grammars. *Journal of Verbal Learning and Verbal Behavior* 6, 855-863.

Reber, A. (1989). Implicit learning and tacit knowledge. *Journal of Experimental Psychology* 118, 3, 219-235.

Robinson, P. (1996). Learning simple and complex second language rules under implicit, incidental, rule-search and instructed conditions. *Studies in Second Language Acquisition* 18, 1, 27-68.

Robinson, P. (1997). Individual differences and the fundamental similarity of implicit and explicit adult second language learning. *Language Learning* 47, 1, 45-99.

Schmidt, R. (1992). Psychological mechanisms underlying second language fluency. *Studies in Second Language Acquisition* 14, 4, 357-385.

Schmidt, R. (1993). Consciousness, learning and interlanguage pragmatics. In: G. Kasper & S. Blum-Kulka (Eds.) *Interlanguage pragmatics*. New York: Oxford University Press, 21-42.

Snellings, P., A. van Gelderen & K. de Glopper (submitted). Effects of an experimental training program for fluent lexical retrieval in EFL written language production.

Appendix 1

Lesson 1 (first part)
Topic of texts: snowboarding
Objective: deleting and adding information in sentences

<table>
<tr><td>Condition 1
Focus on form/
implicit</td><td>Condition 3
Focus on meaning/
implicit</td><td>Condition 2
Focus on form/
explicit</td><td>Condition 4
Focus on meaning/
explicit</td></tr>
<tr><td><u>Orientation</u>
Exercise in discriminating short and long sentences</td><td><u>Orientation</u>
Exercise in categorizing words in relation to the topic of the lesson (snowboarding)</td><td colspan="2"><u>Knowledge of rules</u>
Presentation of rule and exercise with isolated sentences.

Rule: Sentences consist of sentence parts. [Omar/ walks/on the street] Each part of a sentence always has a <u>kernel.</u> You cannot leave it out. In the next sentence the parts consist of kernels only. You cannot delete any word. [The boy/has/the ball] You can however extend the parts. [The handsome boy with the black hair has the red ball that Ilse is looking for] The italicized pieces do not belong to the kernels. You can leave them out. But they give more information about the kernel. They give a commentary on it. So, the commentary says more about the kernel but can be deleted. Commentary can be placed before or behind the kernel. [before: handsome boy; after: ball that Ilse is looking for]</td></tr>
<tr><td colspan="4">Exercise receptive 1a
[Two texts about snowboarding; sentences of text 1 contain only kernels; sentences in text 2 contain kernels and commentary. After completion of the exercise students check their answers in answer book.]</td></tr>
<tr><td>Read both texts. What is the most important difference according to you? Watch the <u>length</u> of the sentences.</td><td>Read both texts. Which one is better, do you think and why?</td><td>Read both texts. What is the most important difference according to you? Use the words <u>kernel</u> and <u>commentary</u>.</td><td>Read both texts. Which one is better, do you think and why? Use the words <u>kernel</u> and <u>commentary</u>.</td></tr>
</table>

(Appendix 1 is continued on next page)

Condition 1 Focus on form/ implicit	**Condition 3** Focus on meaning/ implicit	**Condition 2** Focus on form/ explicit	**Condition 4** Focus on meaning/ explicit
Exercise receptive 1b [Examples of kernels and commentaries from text 2. Some of the commentaries add *relevant* information about snowboarding but others are just funny. After completion students check their answers in answer book.]			
Check the pieces that have been added in text 2. [It is observed that some pieces of a sentence can be deleted, while the sentence remains correct.]	Why are the underlined pieces in text 2 interesting? Check one of the following answers: a) extra information about snowboarding, b) it helps to understand the text, c) it is fun to read.	Check the pieces that are commentary in text 2. Commentary can come before or after the kernel. [Application of the rule that commentary can be deleted, while the sentence remains correct]	Why are the commentaries in text 2 interesting? Check one of the following answers: a) extra information about snow-boarding, b) it helps to understand the text, c) it is fun to read.

Appendix 2

Revision task 1
First read the assignment below carefully

There is a shortage of misses and masters at school. The students are making a website calling people to become miss or master. A first draft has been written for the website. That text is printed below. The text **really** needs improving. It is unpleasant to read and has too much repetitions.

- Make the text more pleasant to read
- Remove unnecessary repetitions
- Take care that everything must be clear

There are five pieces. Improve the pieces 1 to 5 separately.

Miss or master wanted

1. We have a big problem at our school. It is an annoying problem. The big problem at our school is that children often cannot have lessons. The children often cannot have lessons, because the miss is ill. If the miss is ill, there are no more people to replace her. There are no more people to replace the miss, because there are not enough misses and masters.
2. There are no people any more who want to become miss or master. The people that do not want to become miss or master, are going to look for other jobs. A master or miss does not earn enough money. A master or miss must work too hard.
3. Misses and masters have rather nice work. It is exciting work. It is important work. Misses and masters enjoy very much to engage with children every day.
4. Don't you want to become master or miss? Do you know someone perhaps who wants to become miss or master? If you know people that want to become miss or master, please pass their telephone number. If you pass their telephone number we can ask the masters or misses whether the masters or misses perhaps want to give lessons at ours.
5. We hope that soon the children at our school will not be sent home any more. If soon the children will not be sent home any more the children can do nice things in the classroom. The fact is the children don't like it at all.

Appendix 3

Results of the Mancova-analysis

Source	Dependent Variable	Type III Sum of Squares	df	Mean Square	F	Sig.
Corrected Model	UR	776,337	101	77,634	3,721	,000
	CE	121,829	0	12,183	2,542	,007
Intercept	UR	807,391	1	807,391	38,693	0
	CE	491,014	1	491,014	102,445	0
Grammatical Knowledge	UR	231,914	11	231,914	11,114	,001
	CE	16,903		16,903	3,527	,062
Condition	UR	469,855	4	117,464	5,629	0
	CE	68,152	4	17,038	3,555	0,008
Grade	UR	6,636	1	6,636	0,318	0,573
	CE	0,150	1	0,150	0,003	0,955
Condition X Grade	UR	71,244	44	17,811	0,854	,493
	CE	30,640		7,660	1,598	,176
Error	UR	3964,618	190	20,866		
	CE	910,659	190	4,793		
Total	UR	17653,000	201			
	CE	54459,000	201			
Corrected Total	UR	4740,955	200			
	CE	1032,488	200			