# *A new psycholinguistic taxonomy of self-repairs in L2: A qualitative analysis with retrospection*

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## 0 Introduction

Speech errors have traditionally been seen as exposures of the underlying language formulating machinery, and indeed, besides the study of hesitation devices and pauses, it is the analysis of repair mechanisms that can provide us with the most direct information about the psychological and linguistic processes at work in L1 and L2 speech production and the organisation of communication. Thus the phenomena of repairs and monitoring both in the speech of L1 and L2 speakers have been of great interest to applied linguists, sociolinguists, language teachers, and psycholinguists during the past decades and a great deal of research has been conducted in these diverse fields. Compared to the numerous and highly reliable studies on L1 self-repairs, the investigation of L2 self-correction behaviour from a psycholinguistic perspective, however, has been less advanced. Less research has been conducted on this issue of L2 speech production, and the analytical tools of L2 researchers have also been less reliable than those of their colleagues studying L1 self-repair.

The present paper will argue that one of the reasons for the relatively little progress in L2 self-repair research is that studies in this field have either used an ill-defined taxonomy or have adapted a system of classification which might be appropriate for L1, but not entirely for L2. Although the distribution of repairs established in this way is indicative of the functioning of the monitor, that is, it has the potential of revealing what type of errors or inappropriacies are detected most frequently, the quantitative analysis of the distribution of self-corrections will not provide us with detailed enough information concerning this issue. As this paper will suggest, without some accompanying retrospection procedure the intentions of the speaker may

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not be known, thus the surface manifestations of the self-corrections might represent several types of repairs. Thus, there seems to be a great need for a new, more reliable taxonomy of self-repairs and also for novel research methods, such as retrospection to establish these categories. This belief is in line with recent studies arguing for the usefulness of verbal reports in second language speech production research (e.g., Færch & Kasper 1987, Poulisse et al. 1987).

The purpose of the present paper is to establish a reliable taxonomy of L2 self-repairs, which is in accordance with recent theories of L1 and L2 speech production. As the procedure applied for the data collection aimed at reproducing the natural conditions in which L2 communication can occur, it is hoped that the types of self-corrections identified in the study will be generalizable for other instances of L2 verbal behaviour as well. The retrospective research method was used in order to enhance the reliability of classification.

The paper will first review the existing taxonomies of repair behaviour, which will be followed by the description of the retrospective study carried out for the purpose of establishing a new taxonomy of L2 repairs. After the models of analysis are presented, a new system of classification will be drawn up based on a qualitative analysis of repairs.

## 1 Review of the taxonomies of L1 and L2 self-repairs

The first psycholinguistic studies in this field merely classified repairs according to their surface representation (e.g., Nooteboom 1980) and ignored the speech processes that are involved in the erroneous or inappropriate formulation. Levelt (1983) was the first psycholinguist to propose a precise classification of repairs.

The first type of repair in Levelt's (1983) taxonomy is related to the speaker's problem in ordering the information to be conveyed. As in this case the current message is replaced by a different one, Levelt calls this type of repair DIFFERENT (D) REPAIR. D-repair originates from an error in the conceptualizer, which did not order the information appropriately or encoded incorrect information and, in turn, issued an inadequate preverbal plan. The next type of repair concerns the manner of expression and is called APPROPRIATENESS REPAIR. Levelt's study distinguishes three types of appropriateness-repairs. The first one is AMBIGUITY REPAIR, which corrects an ambiguous reference. APPROPRIATE LEVEL REPAIRS complement the original utterance with more information. Finally, COHERENCE REPAIRS correct the terms which are not coherent with previously used terminology. Brédart (1991) adds a fourth type to the class of appropriateness repairs, namely, REPAIR FOR GOOD LANGUAGE, which involves the replacement of an utterance or part of an utterance either because it is not in accordance with the perceived canonical rules of 'good language', or because it is socially inappropriate.

The next comprehensive category of repairs in Levelt's taxonomy is ERROR REPAIR. In the case of errors, the pre-verbal plan is appropriate, but in the course of the formulation either an erroneously activated word, or an inappropriate syntactic structure, or a wrong morpheme or phoneme is selected. Levelt labels these lexical, syntactic and phonological repair respectively, corresponding to the three main levels of processing in his model. He defines lexical repair as the correction of "any lexical item, colour words, direction terms, prepositions, articles, etc." (1983 : 54) and assumes that in the case of a lexical error the wrong lexical entry is activated and is, in turn, articulated. In his taxonomy, syntactic repair involves the correction of a syntactic construction (*ibid.*). Unfortunately, Levelt fails to give a definition of phonetic repairs.

All the above mentioned repairs have been overt repairs, but, as several researchers have pointed out (e.g., Berg 1986, Blackmer & Mitton 1991, Levelt 1983, 1989, Postma et al. 1990, Postma & Kolk 1992, 1993), inappropriate or erroneous output can be repaired before articulation. These studies unequivocally claim that COVERT REPAIR proceeds in the same way as overt self-repair. Since the reparandum is not articulated, one can only infer the existence of this process from its indirect manifestations such as word or phrase repetitions, blocking, prolongation, syllabic repetition or silent pause (Postma & Kolk 1992).

Levelt's (1983) taxonomy classifies L1 self-corrections in a detailed and psycholinguistically accurate manner. Nevertheless, several problems can arise when this system of classification is applied. First of all, if the specific instances of self-corrections are classed on the basis of their surface representations, without the knowledge of the intentions of the speaker, the results of the studies carried out in this way might prove to be inaccurate especially in L2 repair research. On the other hand, the definitions of the subtypes of error repairs are not precise enough, and therefore it might be difficult to distinguish certain instances of error repairs, especially lexical and syntactic error repairs. In addition, Levelt (1983) does not explain into which category repairs of morphology would belong.

Similarly to L1 self-repair researchers, L2 speech production researchers have also investigated the types and distribution of self-corrections. Fathman (1980) was among the first who carried out a large scale study on L2 self-repair behaviour. Her subjects were 75 L2 English speaking children, who were asked to describe a cartoon and talk about themselves. Upon analysing repairs Fathman distinguished five types of self-corrections: phonological, morphological, syntactic, semantic and lexical self-repairs. Each type of self-correction was further broken down into four sub-classes: omission, addition, substitution/replacement and re-ordering. However, Fathman does not provide a precise definition of the different types of repairs, and as pointed out above, the surface representations of correction behaviour can have several sources, thus the results obtained merely on the basis of these manifestations and without any complementary retrospection data may not be accurate.

Applying a taxonomy partly similar to that of Levelt (1983), Verhoeven (1989) investigated monitoring in children's second language speech and defined certain subclasses of error correction more precisely. In Verhoeven's study three types of corrections were distinguished: phonological, syntactic, and semantic. Phonological corrections involve the repair of "the phonological representations already selected for expression" (*op.cit.*: 146). Syntactic corrections aim at improving the syntactic form of the utterance and can manifest themselves in the form of the "arrangement of word order, the use of appropriate function words, or the selection of the right word final markers" (*ibid.*). In Verhoeven's data analysis semantic corrections repair "the coherence of the utterance to be made" and often "involve the replacement of a content word with another one" (*ibid.*). Whereas the definitions of phonological and syntactic repairs are more accurate than Levelt's, the category of semantic repairs might be too broad as it contains both lexical error repairs and coherence repairs.

Poulisse (in press b) also investigated the correction of the slips of the tongue in the Nijmegen corpus. She differentiated between lexical, morphological, syntactic and phonological slips of the tongue and their corrections. Although she further subdivided lexical, morphological and phonological slips of the tongue and their repairs, she failed to give an account of how they can be distinguished.

Based on a corpus of 4700 self-repairs produced by Dutch speakers in their L1 and L2 in three different types of tasks (picture description, storytelling and personal interview), van Hest (1996a, b) also investigated the distribution of self-repairs in L1 and L2. She has complemented Levelt's (1983) taxonomy with several new classes of repairs, such as conceptual error repairs, which are applied if the speaker has selected a wrong concept. Without retrospection, however, it can prove to be difficult to distinguish lexical error-repairs from conceptual error repairs. Another innovation in van Hest's taxonomy is that she includes appropriateness syntactic and tense and aspect repairs in the category of A-repairs. In this case again, it seems to be difficult to decide whether the speaker repaired erroneous or inappropriate syntax or tense, or has resorted to restructuring due to limited L2 competence.

As the brief review of the taxonomies of self-repair has shown, studies on L2 self-repairs have attempted to further specify or apply Levelt's (1983) system of classification for the analysis of the self-correction and monitoring behaviour of L2 learners, but none of the categorizations have been without problems. Most of the taxonomies classify self-repairs based on their surface representations only and they fail to consistently consider the underlying psycholinguistic mechanisms. Consequently, there undoubtedly exists a need for a more reliable and informative taxonomy of self-repairs in L2.

## 2 Models of analysis

Self-repairs can be analysed on the basis of several compatible and in psycholinguistics widely used and accepted models of speech production: Levelt's (1989) model of L1 speech processing and the various adaptations of Levelt's model for L2 speech processing, most notably those of de Bot (1992), Poulisse & Bongaerts (1994) and Poulisse (in press a). In the following section of the paper only Levelt's (1989, 1993) model will be briefly described as this theory is the most directly relevant one to the investigation (for a review of models of L2 speech production see Poulisse in press a).

### Levelt's (1989, 1993) model of speech production

Several attempts have been made in the literature to set up a comprehensive model of speech processing but the most widely used theoretical framework in L2 language production research is Levelt's (1989, 1993, 1995) model originally developed for monolingual communication (for a schematic representation, see the Figure on the next page).

Levelt argues that speech production is modular, that is, it can be described through the functioning of a number of processing components that are relatively autonomous in the system. Five principal components are distinguished: the CONCEPTUALIZER, the FORMULATOR, the ARTICULATOR, the AUDITION (later relabelled as the ACOUSTIC-PHONETIC PROCESSOR), and the SPEECH COMPREHENSION SYSTEM (relabelled as the PARSER), as well as three knowledge stores: the LEXICON, the SYLLABARY (containing phonological information) and the store containing DISCOURSE MODELS,

**Figure.** Schematic representation of the processing components involved in spoken language use (based on Levelt 1993 : 2 & 1995 : 14; used with permission).

SITUATIONAL and ENCYCLOPEDIC KNOWLEDGE. Although the Figure and the new terminology may seem highly complex at first sight, the basic mechanisms of speech processing are conceptualized by Levelt in a fairly straightforward manner: people produce speech first by conceptualizing the message, then formulating its language representation (i.e., encoding it), and finally by articulating it; with regard to speech perception, speech is first perceived by an acoustic-phonetic processor, then it undergoes linguistic decoding in the speech comprehension system (i.e., the parser), and is finally interpreted by a conceptualizing module. The unique feature of the model is the integration of the two processes into one comprehensive system, and its richness in details. For example, it precisely specifies the role of the 'lexicon' and the procedures of 'monitoring' in relation to the processing components, and delineates explicit directional paths between the modules outlining their cooperation in producing their joint product, speech.

In Levelt's model the processing components are 'specialists' in the particular functions they are to execute, that is, they do not share processing functions. A component will start processing if, and only if, it has received its characteristic input. Levelt assumes that processing is incremental, which means that as soon as a preverbal chunk is passed on to the formulator, the conceptualizer starts working on the next chunk regardless of the fact that the previous chunk is still being processed. As a consequence, the articulation of a sentence can begin long before the speaker has completed the planning of the whole of the message. Thus, parallel processing is taking place as the different processing components work simultaneously. This is only possible because most of the actual processing, particularly the encoding phase, is fully automatic. As de Bot (1992) points out, the incremental, parallel, and automatized nature of processing needs to be assumed in order to account for the great speed of language production.

Let us now look at the main processing components involved in generating speech as depicted in the Figure, which is the 'blueprint' of the language user. The first component, the CONCEPTUALIZER, generates the message through (a) MACRO-PLANNING, which involves the elaboration of the communicative intention down to the level of conceptual and propositional message content, resulting in macro-plans that Levelt (1989) calls SPEECH-ACT INTENTIONS, and (b) MICRO-PLANNING, which shapes the semantic representations that are associated with the message content by assigning a particular information structure to the macro-plan, thereby finalizing it for expression, resulting in the PREVERBAL MESSAGE. As the name suggests, this preverbal message is not yet linguistic although it is linguistically accessible, that is, contains all the necessary information to convert meaning into language.

The preverbal message is the output of the conceptualizer and, at the same time, the input of the next processing module, the FORMULATOR, which is the component in charge of selecting the lexical units and carrying out grammatical and phonological encoding. The formulator retrieves information from the speaker's mental LEXICON, which in Levelt's model consists of LEXICAL ENTRIES, each made up of (a) LEMMAS that specify the meaning and the syntax of the lexical entry and (b) LEXEMES that carry information about the morpho-phonological form of the lexical entry. In order for the preverbal message to be accessible to the formulator, it must contain lexicalizable CHUNKS. It is not clear, however, whether this chunking is the result of micro-planning or is carried out by another processing module mediating between the conceptualizer and the formulator (cf. de Bot & Schreuder 1993, Poulisse 1993).

The primary procedure to take place in the formulator is LEMMA ACTIVATION; the speaker will retrieve the lemma whose meaning best matches the semantic information carried by the corresponding chunk of the preverbal message. Based on Bresnan's (1982) lexical theory of syntax, Levelt (1989) assumes that the selection of the lemma activates its syntax, which, in turn, triggers syntactic building procedures. Thus, Levelt considers semantic activation primary to form activation and sees the lexicon as a mediator between conceptualization and grammatical/phonological encoding — an assumption he calls the LEXICAL HYPOTHESIS; consequently, he attributes a central role to lemma retrieval in the speech process.

The output of grammatical encoding is the SURFACE STRUCTURE, which is "an ordered string of lemmas grouped in phrases and sub phrases" (Levelt 1989 : 11). This is further processed by the PHONOLOGICAL ENCODER, which makes use of the phonological information of the lexical item contained in the lexicon, resulting in the PHONETIC or ARTICULATORY PLAN (or 'internal speech'). This is then transformed into overt speech by the ARTICULATOR, drawing on the repertoire of articulatory gestures stored in the SYLLABARY.

Levelt's model also accounts for MONITORING in speech production. The MONITOR is located in the conceptualizer but receives information from the separate SPEECH COMPREHENSION SYSTEM (or PARSER), which, in turn, is connected to the mental lexicon. In order to avoid the necessity of duplicating knowledge, Levelt assumes that the same lexicon is used for both production and perception, and the same speech comprehension system is used both for attending to one's own speech and for checking other speakers' utterances (via the acoustic-phonetic processing module). Furthermore, the interpretation of the perceived messages is carried out by the same conceptualizing module as the one in charge of generating one's own messages. This uniformity of the underlying processing modules justifies the inclusion of self-correction and meaning negotiation mechanisms in a coherent, psycholinguistically motivated discussion of L2 problem-management.

In Levelt's system of speech processing there are three monitor loops (i.e., direct feedback channels leading back to the monitor) for inspecting the outcome of the production processes. The first loop involves the comparison of the preverbal message with the original intentions of the speaker before being sent to the formulator. The second loop concerns the monitoring of the phonetic plan (i.e., 'internal speech') before articulation, which is also called 'covert monitoring' (see also Postma & Kolk 1992, 1993, Postma et al. 1990). Finally, the generated utterance is also checked after articulation, which constitutes the final, external loop of monitoring, involving the acoustic-phonetic processor. Upon perceiving an error or inappropriacy in the output in any of these three loops of control, the monitor issues an alarm signal, which, in turn, triggers the production mechanism for a second time. If a mere lapse has occurred in the speech encoding process, the same preverbal plan is re-issued and processed in the hope of an error-free output. If there is a mismatch between the preverbal plan and the speaker's original intention, or if the speaker perceives that the originally issued message is itself inappropriate or inadequate, a new message is generated in the conceptualizer and encoded in the formulator.

## 3 The design of the study

The subjects of the study were 30 native speakers of Hungarian, who were learning English in a foreign language setting. Ten participants spoke English at an intermediate level and attended an exam preparation course in a language school in Veszprém. Their age ranged between 16 and 22. Ten subjects were upper-intermediate learners aged 25–35 participating in an evening course at ELTE, and 10 students' level of proficiency was advanced, and they study English as day-students at ELTE.

A C-test was administered to all participants to measure their level of proficiency. Following the test, the subjects were interviewed one by one in a separate room to ensure environmental reliability. First, the participants were asked to act out an approximately 5 minute-long information-gap type role-play activity adapted from Jones (1991 : 218) with the researcher being the interlocutor. The subjects' task was to answer an enquiry concerning a private room in a restaurant. Instructions and the necessary background information were provided in the native language of the subjects (see the Appendix for the English translation of the participant's task sheet). Upon performing the task the subjects had to answer unexpected questions, such as what dishes the menu contains and what the room looks like, as well as to react to the problems of the customer and find compromises. Thus this task involved unpredictable interaction and considering new information, which seemed to place heavy cognitive load on the subjects. Consequently, it was assumed that participants in the research would focus rather on meaning than form, which would ensure the modelling of real-world interactions.

The role-play task was followed by a 25–35 minute-long retrospective interview in the native language of the subjects, in which upon listening to their own speech, they were requested to recall what problems they experienced in formulating their message in L2 and how they were trying to solve these problems. The retrospective interview was conducted on the basis of the guidelines set up by Ericsson & Simon (1980, 1987, 1993) to ensure the reliability of the data gained in this way. The retrospective interview was partly controlled as subjects were asked to comment on specific aspects of their performance only, but the information they could provide was not predetermined. The recall of relevant information was aided by asking the subjects to verbalise their thoughts upon listening to their speech on a tape recorder. The retrospective report was to a certain degree self-initiated because the participants were requested to stop the tape when finding instances of breakdowns or self-repairs and comment on them. Nevertheless the researcher also took the initiative to ask questions if the subjects failed to reflect upon relevant hesitation phenomena or instances of self-correction. Due to the fact that the subjects were not informed that they would need to comment on their performance before carrying out the task, the request to provide retrospective comments was not supposed to influence task performance.

The performance of the task and the subsequent retrospective interview were both video- and audio-recorded. The transcriptions of the tasks were done by trained transcribers and were checked by the researcher herself. The retrospective interviews were transcribed by the researcher.

## 4 Results and discussion

On the basis of the qualitative analysis of repairs found in the speech of the participants of the study, it is suggested that four main types of psycholinguistic mechanisms underlie self-repair in L2; that is, Levelt's (1983) tripartite taxonomy of repairs for L1 is extended with a fourth major type of self-correction: REPHRASING-REPAIR. In addition, a more precise psycholinguistic definition of the different types of self-repairs will be provided. (The table below contains a comparison of the existing L1 taxonomies and the system of classification proposed here.)

**A comparison of L1 and L2 taxonomies of self-repairs**

| **Main classes of self-repairs** | **Subtypes of self-repairs** | |
|---|---|---|
| | **L1**<br>(Levelt 1983, Brédart 1991) | **L2**<br>this paper |
| Different information repair | Different information repair | Ordering error repair<br>Inappropriate information repair<br>Message replacement repair |
| Appropriacy repair | Appropriate level of information repair<br>Coherent termonology repair<br>Appropriate level of information and coherent terminology repair<br>Repair for good language | Appropriate level of information repair<br>Coherent terminology repair<br>Appropriate level of information and coherent terminology repair<br>Repair for good language<br>Pragmatic appropriacy repair |
| Error repair | Lexical error repair<br>Syntactic error repair<br>Phonological error repair | Lexical error repair<br>Grammatical error repair<br>Phonological error repair |
| Rephrasing repair | ——— | Rephrasing repair |

## 4.1 Different information repairs

The first type of repair to be discussed is a self-correction which involves the modification of the content of the preverbal plan. In the case of a mistake in the conceptualizing phase of the speech production process, the speakers might decide to encode different information from the one they are currently formulating. This type of repair is called DIFFERENT INFORMATION (D-) REPAIR (Levelt 1983). Levelt identifies two reasons why one might want to choose to convey different information; firstly, one can realize that parts of the intended message need to be ordered differently, like in (1), and secondly the information content of the message can prove to be inappropriate or incorrect, like in (2).*

(1) Uhm — well there's a — big dining table for — forty person. + And — then + **we've also got — er well it's + well the dining table** occupies half of the room.
*(Retrospection: I thought, I did not tell you first how big the room was, so I said that the dining-table occupies half of the room, and then I said what I originally wanted to say.)*

(2) **you** have to + **we** have to + make a contract
*(Retrospection: I realised that it is stupid to say that you have to make a contract, it's the restaurant who has to write it.)*

In (1), the participant realizes that she did not follow the rules of spatial descriptions and has started talking about the details of arrangement before actually providing the listener with background information about the size of the room. Upon noticing the problem, she interrupts her current utterance and reorders the description of the room. In (2), the respondent perceives that she has encoded inappropriate information, as it is not the customer who has to write a contract, but the management of a restaurant. In order to rectify the problem, she replaces 'you' with 'we'. On the basis of these two types D-repairs are further subdivided into ORDERING ERROR (DO-) REPAIRS and INAPPROPRIATE INFORMATION (DI-) REPAIRS.

If one accepts Levelt's (1983) definition of D-repair, namely, that in this case the speaker decides to encode different information from the one he/she is currently formulating, a third type of D-repair can be identified in the speech of L2 learners, which we will call MESSAGE REPLACEMENT (DM-) REPAIR. This new category of self-corrections occurs when speakers abandon their originally intended message and replace it with another one. In (3), the participant substitutes the original message with another one due to limited L2 competence, while in the case of (4), the learner decides to encode some alternative information because another, perhaps more relevant, idea came to her mind. This latter process can also take place in L1 speech, especially in informal conversations.

* Transcript notation:
— = 0–0.5 sec long pause
+ = 1–2 sec long pause
++ = 2–3 sec long pause
+++ = pause longer than 3 seconds
::(:) = prolonged sound

(3) **we have some er + er v... maybe you have** vegetarians in your group
*(Retrospection: Here the idea of vegetarians suddenly popped up and I abandoned what I was going to say because I would not have been able to list any more types of food anyway.)*

(4) **you have you can** + sit + at a big + table
*(Retrospection: Here I wanted to say something like 'you have the possibility to see each other', but then another idea came to my mind and I did not finish the previous one.)*

It has to be noted, however, that in some cases (e.g., in (3)) DM-repairs are very similar to the problem-solving strategy of message-replacement, as this type of self-correction can also arise when the speaker does not feel capable of executing the original pre-verbal plan, and, as a result, interrupts the encoding of the original message and substitutes it with a different one. In the case of the communication strategy of message replacement, however, very often the original message is not articulated and the replacement process takes place even before the pre-verbal plan is sent to the formulator.

### 4.2 Appropriacy repairs

APPROPRIACY (A-) REPAIRS are different from different information repairs in that they are employed when the speaker decides to encode the originally intended information but in a modified way (Levelt 1983). Speakers resort to A-repairs when they have encoded (i) inaccurate or (ii) ambiguous information that needs to be further specified, or if they have used (iii) incoherent terminology or (iv) pragmatically inappropriate language. The first three classes of self-corrections have been identified by Levelt (1983), and the fourth by Brédart (1991), who called this latter type REPAIR FOR GOOD LANGUAGE, which included both pragmatic and good language repairs. In the present paper, it is proposed that these two groups of self-repairs be more clearly separated, as their sources are distinctly different. Pragmatic self-corrections concern meaning in context, while repairs of good language are carried out to ensure a more sophisticated manner of expression.

In the first case, when the original message has not been precise enough, the speaker can decide to provide further details and carry out an APPROPRIATE LEVEL OF INFORMATION (AL-) REPAIR (Levelt 1983). In (5) the speaker realizes that she has not given accurate information as regards the number of tables in the restaurant and inserts 'about' to be more exact.

(5) there are er + er + **twenty er + tables + er + about twenty tables.** *(Retrospection: Here I was thinking about the number of the tables in the restaurant.)*

Besides supplying inaccurate information, one can also fail to express their message unambiguously. In this case, AMBIGUOUS REFERENCE (AA-) REPAIRS are applied to correct the referring expression (Levelt 1983). In (6), the pronoun 'it' could not only denote the restaurant but the university as well, and consequently, the speaker replaces 'it' with 'this restaurant'.

(6) in this — uhm — in this part of the town — er there are many vegetarians er this is because the — university is here and vegetarians **like it + er — like this restaurant**

A similar type of self-correction is COHERENT TERMINOLOGY (AC-) REPAIR, when the speaker corrects incoherent terminology (Levelt 1983). This type of self-repair seems to be genre dependent, and no instances of this category have been found in my corpus, therefore (7) has been borrowed from Levelt's corpus (1983 : 53).

(7) Ga je een naar boven, **is** uh **kom** je bij geel
Go you one up, is uh come you to yellow
'If you go one upwards, **is**... **you come** to yellow.'

In some cases it might prove to be difficult to decide whether the speaker has intended to further specify the original message or repairs incoherent terminology. Levelt (1983) assigns such instances of self-corrections into the mixed category of APPROPRIATE LEVEL OF INFORMATION AND COHERENT TERMINOLOGY (AL-) REPAIRS. (8) serves as an illustration for AL repairs: in this case, the analyst cannot determine whether the subject has used the word 'order' instead of 'letter' in order to be more precise or because she has used the same expression two turns before as well.

(8) in this case er if it is so urgent and important for you, we would like er you to:: to write us an order — er in er 24 hours that you make sure that you will er come and book this err room.
R: Well, that's fine. But we might have two problems with this. Er one is that er er I'm not sure that there will be 35 people in our er company, maybe there'll be only 24. Is that a problem, if there is only 24 or 25 of us?
S: We may — agree if you::: er er would like er to:: to arrange the room er on this er condition — that you will have enough er place but

I'm not sure that we can reduce the price er because of this.
R: I see, all right and then I can only pay the deposit next week when I er find out how many people come and when I have talked to all of the people.
S: Er but **this letter** is er — **the order** — er **your request** is er anyway — needed and we:::

Another source of issuing an inaccurate pre-verbal plan can be pragmatic inappropriacy, in which case the speaker repairs part of the message which he/she feels to be pragmatically unacceptable in the given situation (Brédart 1991). In (9), the participant has realized that 'it does not matter' is too informal in a service encounter and, in turn, she has interrupted the encoding of this formula and replaced it with 'it's not a problem'. We will call this type of repair PRAGMATIC APPROPRIACY (AP-) REPAIR.

(9) **it doesn't + it's not a problem**
*(Retrospection: First I wanted to say 'it does not matter' but I realised that in a business deal you cannot say 'it does not matter'.)*

In the discussion of pragmatic repairs, however, certain issues concerning Levelt's (1989, 1993) theory of speech production have to be raised. Situational knowledge is assumed to be stored in Levelt's model either in the encyclopedia or in the knowledge store for situational knowledge (see the Figure on page 48). Similarly to linguistic deficits in the L2, less proficient L2 speakers may lack some important situational specifications (for a summary of the development of pragmatic competence, see Kasper 1996), which, according to Thomas (1983), may lead to two types of pragmatic problems: pragmalinguistic and sociopragmatic failure. The former concerns the mapping of inappropriate pragmatic force onto (usually highly conventionalized) utterances; the latter stems from insufficient knowledge about the social parameters of the communication situation, that is, of the social conditions placed on language in use. In L2 use, pragmalinguistic problems may be caused either by lacking the knowledge of a formulaic phrase necessary to encode or decode a pragmatic function, or attaching incorrect illocutionary specification to a lexical item either because of incorrect learning or due to some error in the sociopragmatic interpretation of the situational parameters.

It is not clear at present which processing module assigns specifications regarding illocutionary force to the message and what kind of mismatch causes pragmalinguistic errors. The problem is that illocutionary specifications do not appear to be absolute but rather situationally dependent (i.e., we cannot attach an absolute illocutionary value to a given phrase), and therefore these should be regulated by the conceptualizer, which is the only processing module that has access to the situational knowledge store. This is the reason why it is proposed that the correction of pragmalinguistic errors should be included among pragmatic appropriacy repairs, and it should not be categorized as grammatical error repair. On the other hand, it has to be noted that the conceptualizer does not have a direct link to the lexicon and cannot, therefore, directly map pragmatic force onto lexical items.

Brédart (1991) included pragmatic appropriacy repairs in his newly established group of self-corrections under the name of repairs for good language. In the present study, a distinction has been made between corrections which aim at rectifying pragmatic errors, and utterances, which are pragmatically acceptable, but which the speaker judges to be not sophisticated enough according to his/her standards of eloquence. We will only call the latter type of self-correction repair for good language. Instances of such repairs are frequent in the speech of more advanced learners, whose production processes are so automatic that they can pay attention to refined lexical choice. In (10), the speaker replaces the word 'persons' with 'people' as she remembers that she has used 'persons' several times before, while in (11), another subject substitutes 'I should think' for 'I think' merely because she finds it more elegant in expression.

(10) thirty-five **per — people**
*(Retrospection: First I wanted to say 'persons' but I had used 'persons' several times before, so I said 'people'.)*

(11) **I think er + I should think** it's about
*(Retrospection: I think, the second one was stylistically better.)*

### 4.3 Error repairs

Error repairs involve psycholinguistically different mechanisms from the above discussed two types of repairs as in this case the speakers repair an accidental lapse which occurs in the formulator rather than a deficiency in the conceptualization process. Such lapses can occur at every phase of speech processing, that is, during lemma retrieval, grammatical and phonological encoding and articulation. When the monitor perceives this type of problem, it sends an alarm signal to the conceptualizer, which re-issues the same pre-verbal plan without any modification in the hope that this time the message will be accurately processed (Levelt 1989).

As mentioned above, classifying error repairs according to the nature of the reparandum blurs the psycholinguistic processes underlying self-correction to a great extent. Therefore we argue that error-repairs should be grouped on the basis of where they occur in the process of encoding. In the following an attempt is made to clearly delineate the three main types of error repairs: LEXICAL, GRAMMATICAL and PHONOLOGICAL ERROR REPAIRS.

## 4.4 Lexical error repairs

In Levelt's (1989) model, the first phase in the processing of the pre-verbal plan is when the lemma corresponding to the concept specified by the pre-verbal plan is retrieved, which is called lexical access or lemma retrieval. Evidence from research on slips of the tongue both in L1 (e.g., Fromkin 1973, 1980, Dell & Reich 1981; Stemberger 1985) and L2 (Poulisse in press b) shows that failures of lexical access are frequent. Thus the correction of an accidentally erroneously activated lemma will be called LEXICAL REPAIR. As in Levelt's theory both content and function words as well as phrases and idioms are considered to be lexical entries, i.e., lemmas, lexical repair will involve the correction of erroneously activated content and certain function words (see below), phrases, idioms and collocations. In addition, repairs of derivational morphology, for example replacing 'different' with 'difference', also belong to the category of lexical error repairs, as in Levelt's model of the lexicon, derivatives constitute different lexical entries. (12) and (13) illustrate instances of lexical error repairs.

(12) you have to — er rent it er ++ for + 35 — person ++ uhm it's **max... minimum** minimum yes
*(Retrospection: I realised that I was not using the right word. It's not 'maximum', but 'minimum', since it is a room for 40 people.)*

(13) will er have to — pay +++ **er five er sorry — er twenty-five** percent +++
*(Retrospection: Here I said 'five' instead of 'twenty-five' accidentally.)*

One of the problems of the classification of lexical repairs involves corrections within idioms or expressions. In (14) the speaker has selected the preposition 'on' first, which she replaces with 'in' as a result of the repair.

(14) **on** a **in** a + written form

It can be assumed that in the case of L2 speakers, many of the idioms and expressions have not been fully automatized and therefore are not stored as a complete lexical entry. Although very little is known about the processes of lexical encoding or word formation, the mechanisms through which L2 speakers construct these set phrases can be similar to those of creating new words. Therefore it is proposed that corrections of this kind should be considered lexical repairs which do not occur in the phase of lemma activation, but in the process of lexical encoding.

### 4.5 Grammatical error repairs

The next phase of speech processing where lapses can occur is grammatical encoding, which, based on Kempen & Hoenkamp's (1987) Incremental Procedural Grammar, is assumed to consist of 6 phases. First, the lemma's syntactic category initiates a categorial procedure so that the phrasal category in which the lemma can be a head of the phrase is established. Second, the message is inspected as regards what conceptual material can fill the obligatory and/or optional complements and specifiers of the lemma and the diacritic parameters are set. After this, the formulator can proceed with the next step of grammatical encoding, which phase activates the subroutines that handle the complements, the specifiers and the parameter values specified at the previous stage. Fourth, the materials processed at step 3 are ordered as determined by the categorial procedure, which builds the phrases of the utterance. Fifth, the categorial procedure selects a grammatical function for the processed material, which means that it will decide whether the output will become a head or a complement of a higher order categorial procedure such as NP′, VP′, AP′, PP′ or S. Finally, the higher order categorial procedure described above will be activated and it will start processing the relevant fragment of the message from either the lemma retrieval phase or from step 2.

The different analyses of the corpus of grammatical slips of the tongue (e.g., Fromkin 1973, 1980, Garrett 1980; Levelt, 1983) suggest that lapses can most frequently occur at stages 2, 3 and 4 of the grammatical encoding process, that is, when the various complements, specifiers and parameters are encoded and handled by the different subroutines and when these processed materials are ordered. (15) serves as an illustration for a repair which corrects the order of the constitutents.

(15) Uhm +++ **This I — I said that this** a quite er big room er +++

Consequently, grammatical repairs can be defined as the correction of a lapse which occurs in the grammatical encoding phase.

The terminology suggested in this paper differs slightly from that of Levelt (1983), as he calls this category of error repairs SYNTACTIC REPAIR. The term 'syntactic', however, can be misleading as it does not indicate clearly where repairs of morphology belong. First of all, the present paper proposes that repairs of derivational and inflectional morphemes should be handled separately. As derivations (e.g., complete, incomplete, completeness) are assumed to be different lexical entries (Butterworth 1983, cited in Levelt 1989), and word-formation is supposed to take place as a part of lexical encoding (Levelt 1989), corrections in derivational morphology need to be classified under lexical repairs. On the other hand, inflectional morphemes are encoded and processed in the grammatical encoding phase (stages 2 and 3), thus their repairs belong to the class of grammatical repair. As a result, corrections of the form of the same lexical entry should be classified as grammatical repairs. (16) illustrates the case when the wrong form of the lexical entry 'be' has been accessed during the VP building procedures, and is corrected for 'are'. In (17) the speaker encoded the wrong form of the past tense for the verb 'choose', and repairs it for the correct one.

(16) er our vegetarian menus **i**... **are** very good

(17) it was + nice to + meet you and + that you + **choose** + you **chose** us

The differentiation between lexical and grammatical repairs, however, is not without problems, as the processes of lexical access and grammatical encoding are closely related. For example, in step 3, when the subroutines handle the complements and specifiers, lemma activation also takes place, as these complements and specifiers also have to be accessed. Consequently corrections in the erroneous access of the lexical entry of a complement or specifier (e.g., the specifier of a noun phrase, such as in (13) above) is not considered to be grammatical repair.

Another issue is where corrections of certain function words, such as prepositions and auxiliaries would belong. In order to overcome these difficulties of classification, it is worth distinguishing function words which have conceptual specifications and those which do not (Levelt 1989). In the case of prepositions, for example, 'under' in 'Mary put her bag under the table' specifies a direction or path of movement. Corrections of these types of prepositions should be considered lexical repairs, as in these cases the processes of lemma activation are at work. On the other hand, the preposition 'to' in the sentence 'The mother explained the rules of the game to the child' has no conceptual specification, and its function is to specify the case for the NP it is heading. As these prepositions are addressed by the syntactic building procedures (Levelt 1989), it is proposed that instances of repairs concerning these prepositions should be considered syntactic repairs. An illustration for this process is (18), where a correction in the encoding of the complement of the verb 'decide' takes place.

(18) then you + if you + er **decide it + decided it on**
*(Retrospection: I was looking for the right way of saying decide on.)*

The classification of repairs of auxiliaries can also be conceived of in a similar way. Certain auxiliaries in English, such as 'have', 'be' and 'do' similarly to the preposition 'to' in the above example have no conceptual specification and are addressed by VP building procedures during the process of syntactic encoding. Therefore their repairs need to be grouped under syntactic repairs. (19) illustrates the case when during the encoding of the negative form of the verb, the wrong auxiliary has been accidentally accessed.

(19) you + **don't** + you **aren't** interested in Hungarian food
*(Retrospection: I realised that another structure had to be used here.)*

On the other hand, modals such as 'can', 'may' or 'shall' have independent semantic activation conditions (Levelt 1989; Lyons 1977) and are retrieved by means of lemma activation, thus it is logical to assume that their corrections are lexical repairs. (20) can serve as an illustration for the correction of a modal auxiliary, which is to be considered lexical repair.

(20) you + er **you ca you must** assure us that

### 4.6 Phonological repairs

The next steps of speech processing are phonological encoding and articulation. As research on phonological slips of the tongue is abundant (for a review see Fromkin 1980, Levelt 1989), here it will suffice to assume that the correction of the lapses occurring in these two phases of encoding will be called phonological repair. (21) illustrates the correction of the type of phonological slips when an additional phoneme intrudes into the nucleus of the syllable.

(21) we could arrange er — more — smaller **[tɑɪbɪə] tables** if you would like that — better

Phonological repairs can involve the correction of a phoneme, an allophone, an allomorph, as in (22), the metrical and intonation structure of a word or of a string of words (intonational phrases).

(22) there's a place for **a** + for **an** orchestra

### 4.7 Rephrasing repairs

As opposed to appropriacy and different repair, the next type of repair involves the revision of the preverbal plan without changing the content of the original message. We will call this type of repair rephrasing repair, in the course of which the speaker repeats the slightly modified version of a word or phrase by adding something and/or using paraphrase because of uncertainty about its correctness. Rephrasing repair is also different from error repair in that the latter merely involves the correction of an accidental lapse and, consequently, the issuing of an unmodified pre-verbal plan. (23) shows that the speaker was uncertain about the success of her accessing the right lexical entry and consequently decided to substitute 'reflect' with 'answer'.

(23) we will er **reflect er to you in another letter we will answer you**
*(Retrospection: What happened here was that I was not sure whether 'reflect' really means 'answer', I knew what 'reflect' means but I do not know whether you can use it for writing as well, that is whether it means the same in writing as in speech that you 'reflect on something'.)*

Apart from the fact that rephrasing repairs are psycholinguistically different mechanisms from error repairs, sociolinguistic and discourse perspectives also support the need for the establishment of this new category. In her seminal paper, Tarone defined communication strategies as "mutual attempts of two interlocutors to agree on a meaning in situations where the requisite meaning structures do not seem to be shared" (1980 : 420). On the basis of these defining criteria, Tarone rejected Schwartz's (1977, cf. Tarone 1980) claim that all self-repairs are communication strategies, but asserted that the type of repair where the aim of the correction is to "move the utterance closer to intended meaning or socially accepted form" (*op.cit.* : 426) can be classified as a communication strategy. If, however, the repair corrects a linguistic form, it should not be considered a communication strategy (*ibid.*). This differentiation is completely in line with the system of classification proposed here.

On the other hand, it is understandable that researchers of L1 speech production have failed to distinguish error repairs from rephrasing repair. One reason for this is that situations where L1 speakers' knowledge of the language is incomplete are less frequent, thus rephrasing repairs occur less frequently in L1 speech than in L2. In addition, it is not easy to delineate these two types of repair processes without retrospection. Apart from retrospective comments, the placing of the cut-off point in repair and the amount of hesitation before making the correction might also help in the analysis. The reparandum in error repairs is frequently cut off before the complete articulation of the word (Levelt 1983, Brédart 1991), whereas it is expected that in the case of self-rephrasing repairs the word or phrase to be reformulated will be completed. It is also hypothesised that more extensive hesitations will precede rephrasing-repairs, since the speaker has to reformulate the pre-verbal plan and perhaps also employ a resource-deficit related strategy, which takes longer processing time than issuing the same pre-verbal plan.

## 5 Conclusion

This paper has argued that both the L1 and L2 psycholinguistic taxonomies of self-repair behaviour have certain shortcomings and this might influence the results of the studies on self-corrections. There is therefore a need for a new system of classification of self-corrections. On the basis of a retrospective study carried out specifically for obtaining relevant data for the purpose, it was suggested that Levelt's (1983) taxonomy of L1 self-repairs needs to be modified so that it could be applied for the analysis of repairs in L2.

It was argued that for the analysis of speech samples elicited under less control than in Levelt's study, the category of different repairs should be further subdivided into ordering error repairs and inappropriate information repairs. A new class of different information repair has also been identified: message replacement repair, in the case of which the speaker completely gives up the originally intended message. This type of repair is frequent in L2 speech, but can occur in informal L1 conversations as well.

Within the class of appropriacy repairs, Brédart's (1991) group of repair for good language has been divided into two types of self-corrections: pragmatic appropriacy repairs and repairs for good language. The former concerns the modification of meaning in context, and the latter the manner or the eloquence of expression.

It was argued that psycholinguistically more accurate results can be obtained in speech production studies if error repairs are classified not on the basis of their surface representations, that is, based on the nature of the reparandum, but according to the locus of the lapse in the message processing phase. An attempt was made to delineate lexical and grammatical repairs more distinctly. It was proposed that the criterion for assigning repairs into these two categories should be whether the given lexical entry is accessed via the syntactic building procedures or on the basis of its conceptual specification, that is, lemma activation. In the first case, the instance of self-correction should be classified as grammatical repair, and in the second case as a lexical repair.

Finally, a new category of repairs, rephrasing repair, has also been proposed. This type of repair involves the modification of the preverbal plan but leaves the content of the message unaltered. It was argued that rephrasing repair is similar to communication strategies (Tarone 1980) and is employed when the speaker is uncertain about the correctness of the utterance.

From a methodological perspective it can be concluded that retrospection might be of great help in establishing different categories of self-corrections and in increasing the validity of classifying repairs into these categories. Examples from the corpus illustrated that without retrospective comments several instances of repairs would have been incorrectly classified.

APPENDIX

### Participant's task sheet

You are the manager of the Golden Fish Restaurant. You'll receive a booking enquiry. Study this information before the customer arrives.

**Information:**

- Private room: capacity 40 persons but only if 35 people book, not for smaller number.
- The room is available on 18 and 19 December.
- You require confirmation in writing with 25% deposit within 24 hours.

**Task:**

1. Greet the customer.
2. Listen to the customer's wishes and try to come to a compromise.
3. Answer the various questions of the customer.
4. Say good-bye.

(adapted from Jones 1991 : 218)

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