

## Chapter 4

# **Cross-linguistic Similarities in Comprehension and Production: The Mental Lexicon**

### **L1 Comprehension and L1 Production**

L1 research has focused more than SLA research has on the relationship between comprehension and production (see, for example, Clark, 1993; Clark & Hecht, 1983; D. Ingram, 1974). There are certainly differences between L1 acquisition and SLA, mainly due to the difference in maturity between children and adult second language learners, and to fact that the learners have already acquired at least one language. Yet the main characteristics of the processes underlying L2 comprehension and L2 production can hardly be all that different from the equivalent processes in L1. At least established relations between L1 comprehension and L1 production are no doubt highly relevant also for the relation between L2 comprehension and L2 production. Both children and learners try to perceive similarities to prior knowledge, and the fact that there are differences between the two kinds of prior knowledge must be of secondary importance. Advanced FL (foreign language) learners learn new words very much in the same way as native speakers (adolescents and adults) learn new words in their L1 (Meara, 1988: 13).

I will now take up some of the salient points made by researchers about the relation between L1 comprehension and L1 production. The study of speech errors throws light on the ways in which formal and semantic similarity works on L1 communication. Fay and Cutler (1977) analyse malapropisms and list other types of speech errors: spoonerisms, anticipations, perseverations, omissions and blends – see also, for example, Aitchison (1976: 208ff.) and Heikkinen and Valo (1984) on slips in interaction, and Laufer (1988) on synforms. The underlying reason for one type of speech error is formal similarity between words. In a true malapropism, no semantic similarity is present. A well-known example is Mrs Malaprop's saying 'She's as headstrong as an allegory on the banks of the Nile'. Another malapropism is 'You keep new-born chicks warm in an incinerator' (for incubator). Further examples of malapropisms are *emancipated* for

intended *emaciated*, *insect* for *index*, and *experience* for *experiment*. Such activation of a formally-similar word occurs in the production mechanism, but intra-lingual formal similarity leading to misinterpretation of words may also affect comprehension, though this aspect does not appear to have been much studied.

There are other types of native speakers' speech error apart from malapropisms caused by similarity of form. Slips of the tongue are most often caused by semantic similarity, without formal similarity being involved. It is quite common for native speakers to make a selection error and produce an antonym (*good* for *bad*, *summer* for *winter*, *midsummer* for *New Year*) or a hyponym or another word with a clear semantic relation to the intended one (*fingers* for *toes*). However, such errors, which the speaker himself often immediately notices, do not occur in L1 comprehension. If somebody utters the word *summer* we interpret it as referring to that season, unless the context leads us to suspect irony or that there has been a speech error. In simple terms a speech error can be described like this: the intended word and a semantically or phonologically similar word are stored close enough for them both to be activated in the production process, and the wrong selection is made. An error in reception may occur owing to confusion of phonologically-similar words, but because they are helped by the surrounding context native speakers are normally able to avoid confusing semantically-similar words in the comprehension process.

In both comprehension and production, form and meaning are paired, but different retrieval procedures are used, and the relationship is not symmetrical. The absence of semantically-based slips in L1 comprehension pinpoints the difference between the two processes of comprehension and production. A word that is formally or semantically similar to the intended one can be easily activated in production, but in comprehension semantically-related words dissimilar in form from the intended one are not activated to the extent that they would compete with the word in the input. Generally speaking, formal similarity, but not semantic similarity, may cause confusion in L1 comprehension.

Both comprehension and production need to be considered for a thorough understanding of the underlying processes of language learning. Clark summarises her discussion of the problem in the following way:

To conclude, there must be different representations for comprehension and production, so both processes can be taken into account in any theory of acquisition. Accounts based on production alone, or comprehension alone, are necessarily incomplete. This view is incompatible with all accounts that simply take for granted that there is a single set of repre-

sentations in memory, neutral between comprehension and production, that captures the idealised speaker's linguistic knowledge. This overly simple view ignores both the asymmetry between comprehension and production observable in all speakers, regardless of age. And also the essential differences, for example, between the auditory information in C-representations and the articulatory information in P-representations. In acquisition, the asymmetry between the two types of representation plays a critical role in the alignment process. C-representations, set up first, offer a means of checking and, where necessary, adjusting the products of early P-representations. (Clark, 1993: 251)

## **L2 Comprehension and L2 Production**

Compared with what has been done in L1-acquisition research, SLA research is narrower in scope. In general, L1-research has been conducted along three different lines: language comprehension, language production and language development. Of these, language production has been the most extensively studied area in SLA research, so much so that learning for production, especially learning grammar, has often at least implicitly been identified with SLA generally. The implications of the work up to the late 1980s, even that of a key figure such as Corder, whose contributions to SLA theory have been of major importance, are that language comprehension and vocabulary studies are, as it were, stepchildren not worthy of treatment at the same level as the study of grammar acquisition for productive use.

Essential in an SLA context is the temporal precedence of comprehension over learning and production. Before items or structures of a new language can be produced, the learner first has to comprehend them. Some comprehension has to occur before production, though it need not be complete prior to production (Clark & Hecht, 1983).<sup>1</sup>

What has often been done in SLA research is to talk about learning problems when the matter under discussion is actually problems in the production mechanisms. The interaction between comprehension and production is also more complex in SLA than in L1-acquisition, where it is easier to get a full picture of the learner's output at various stages. If a consistent distinction is made between learning for comprehension and learning for production this question may be elucidated. Ability to produce presupposes some previous understanding of the underlying systems of phonology, grammar and lexis, while ability to comprehend does so to a much more limited extent, for at least approximate comprehension to occur. If a learner's expectations of general structural similarity between L1 and the TL are at least in essential parts fulfilled, learning for comprehen-

sion can concentrate on salient lexical items, nouns, adjectives and verbs, after a few hundred high-frequency words, including function words, have been mastered. Comprehension focuses on decoding of contextual meaning while structural details remain in the background. Grammaticality and acceptability are concepts far less important to the listener or reader than to the speaker or writer. For English learners, learning the German genders is a main obstacle in L2 production, but it affects L2 comprehension only in a limited way. Fay and Cutler (1977) as well as Channell (1988) discuss the different directional relations between form (sound) and meaning in comprehension and production.

The two distinct processes of production ... and comprehension make differential use of the store of words in the mind. Part of the production process must consist of the selection of appropriate words according to the meaning to be conveyed. The word form is then converted into a phonological shape for onward processing into speech. Thus the direction is meaning to sound. In comprehension, the direction of mapping is sound to meaning. These differences might suggest that for the mental word store the optimal arrangement for comprehension will be according to sound. (Channell, 1988: 85)

Comprehension and production are modes of use relying on different retrieval procedures, and for easy retrieval procedures in L2 comprehension it is essential how much similarity to prior knowledge, formal and functional, has been perceived. For L2 comprehension, the importance of form is manifested in the learners' making use of both intra-lingual similarities and cross-linguistic similarities. For production, again, simple cross-linguistic similarities of form are not as naturally exploited, since the learner starts out from a vague communicative intention, to which various phonological and syntactic procedures are applied.

While good learners may acquire a considerable receptive proficiency, at least of a psychotypologically close language, in a surprisingly short time, achieving advanced speaking or writing ability is much more complex and time-consuming. The different speeds of learning are also connected with the difference between declarative knowledge, ('knowledge that') and procedural knowledge ('knowledge how'). In philosophy, the distinction between declarative and procedural knowledge was made by Ryle (1949). Faerch and Kasper (1987), among others, have used the distinction in SLA research. In reading comprehension, declarative knowledge of vocabulary can take the learner a long way. It may develop rapidly and suddenly, whereas the development of procedural knowledge requires a great deal of time and practice. The relation between declarative and procedural knowl-

edge is further discussed by deKeyser (2005), and earlier by, among others, J.R. Anderson (1983), Anderson & Lebriere (1988) and Singley & Anderson (1989). See also below, p. 91.

The presence or absence of perceived cross-linguistic similarity in comprehension is highly relevant for the varying gap existing between learners' receptive and productive vocabulary. That native speakers can understand many more words than they can produce is self-evident. The same asymmetry is generally true of L2 learners, at least if they have had an extensive L2-input, having learnt the language in a natural environment. There are, however, variations here, in that some learning situations can be found where the gap is very small, almost non-existent. This was the result of Takala's 1984 study, which investigated young Finnish learners of English in a predominantly rural classroom environment in the 1970s, a time when such learners had hardly any L2 input outside the classroom. The near-zero similarity relation between Finnish and English, combined with the limited L2 input, explains the insignificant difference between the receptive and productive vocabularies of these learners. The learning situation of the classroom is quite different from learning in a natural context where there is a wealth of unstructured linguistic input. Similar to the Finnish situation, English speakers learning, say, Arabic or Chinese entirely in a normal classroom context will not be able to understand much more than they can produce. It is almost impossible to tell whether the limited input of a classroom learning situation or the scarcity of perceived similarities for comprehension is the more powerful factor in reducing the normal gap between comprehension and production, but both are clearly important.<sup>2</sup> Another factor in the classroom situation that may contribute to reducing the gap between receptive and productive control of vocabulary is that teachers may require students to produce words whose meanings are not altogether clear to them (see Channell, 1988: 84f.).

There are, then, basic differences between L2-comprehension and L2-production that need to be spelled out, also because cross-linguistic similarity works differently on the two. Lado (1957: 59) commented on the existence of such differences some time ago. A general difference concerns the approximate nature of all comprehension. Although comprehension is often approximate, communication, aided by linguistic and situational context, may still work: one need not understand every detail and every shade of meaning of a message to comprehend its general content.<sup>3</sup> Even native speakers are far from perfect in interpreting a communication partner's intentions.

Learners have choice problems in both comprehension and production: they have to choose between competing activated items. But in production

the learner is faced with a number of choices, not only between different words, but also between different forms of the same word. Above all, the speaker/writer has to activate the knowledge structures himself, without external stimuli.

In comprehension the learner establishes relationships between incoming data and existing knowledge structures in the mind. Comprehension takes place when input and knowledge match each other. The form of a word is already given and it is mapped on to relevant existing knowledge, while in production the speaker himself has to give linguistic form to a pre-verbal intention. When you decide to say something, you 'create a meaning and then search for the word form associated with just that meaning' (Clark, 1993: 249). In production, the function that has to be given linguistic form must originate in the learner's mind. Comprehension and production 'use linguistic rules for different purposes and hence require different processing' (Garnham, 1985: 221). Production requires definite sentence plans for the messages. This means that a greater task effort is required by the learner in production than in comprehension (see Paradis, 1985: 27f.). Production does not have a clearly defined external situational context. It places much greater demands on specificity and accuracy than comprehension does. Similarities between incoming data and existing knowledge structures are more concrete and tangible than similarities between communicative intentions and assumed existing knowledge structures, and here lies an important reason why formal cross-linguistic similarities play a more important part in L2-comprehension than in L2-production. Cross-linguistically similar words, which form the central part of the learner's potential vocabulary, facilitate the learner's task in comprehension, but not at all to the same extent in production. The learner will not use L2 items productively until they, or parts of them, have been learned, but the potential knowledge across languages perceived to be similar is used for comprehension before learning has taken place. Mackey's early work already mentions the facilitative effect of L1 transfer on comprehension (1965: 109f.). Existing knowledge structures are activated by incoming data, all the more so if cross-linguistic or other formal similarities can be established, as they can in comprehension of closely related languages.

### **Perceived and Assumed Similarity**

This leads on to a formulation of another basic difference between comprehension and production of foreign languages. Here the sequence in which the processes are taking place must be considered. In comprehension of related languages, learners can often start out by *perceiving* cross-

linguistic similarity (i.e. formal similarity), to elements of a language they already know. A subsequent stage is the *assumption* of an associated semantic and/or functional similarity. If no formal similarity can be perceived, the learner will have to make do with merely assuming that the languages work in much the same way. Thus, in production and in comprehension of totally distant languages, assumptions provide the starting point: learners merely assume that a similarity exists to a language whose details they do not know (see Jarvis, 1997: 328: 'the source for L1 influence is always an assumed similarity between the L1 and the L2'). Assumption can be and often is based on previous perception, but that is not always the case. For two of the three similarity relations outlined above (similarity, difference and zero relations), perceived and assumed similarity are difficult to distinguish from each other, partly because comprehension and production normally work in constant interaction.<sup>4</sup> This is most obvious across related languages. When there is a zero similarity relation, however, there is a difference between comprehension and production in the extent of transfer, positive transfer. In target languages very distant from the L1, there will normally be little or no visible transfer in comprehension and learning, but transfer will occur in production, when the learner does not perceive but merely assumes that items and systems in the target language will work in more or less the same way as in L1 or some other known language. L1-procedures are used because relevant L2-procedures are not available, and the result is often a large number of errors, many of which may affect the comprehensibility of the message.

The difference between perceived and assumed similarity recalls the discussion of transfer to somewhere/ transfer to nowhere (Andersen, 1983; Kellerman, 1995; see also Jarvis, 1997; Odlin, 2003). Andersen restricts his discussion to syntactic transfer. He says that one of the two conditions for transfer to appear is that the learner must perceive similarity between an element in the L2 and a corresponding element in L1: there must be transfer to somewhere.

Kellerman states that, if cross-linguistic similarity is the driving force behind transfer, then where there is no perceived similarity, there should be no transfer. I do not quite see that this would directly follow from Andersen's argument. Anyway, Kellerman (1995: 137) proposes a refinement of this principle to complement Andersen: that there can be transfer 'which is not licensed by similarity to the L2'. Now, it seems possible to consider Kellerman's examples as instances where Andersen's principle does, in fact, apply (Odlin, 2003: 456). The difference between transfer to somewhere and transfer to nowhere appears to be another way of phrasing the difference between perceived similarity and assumed similarity, and it

also relates to the differences between similarity, contrast and lack of similarity, discussed above. With Andersen and Jarvis, we can certainly agree that similarity is the driving force behind transfer. Likewise, there is no reason to doubt Kellerman's view that transfer can occur where no perceived similarity is involved. Schachter (1983: 104) also makes the point that 'one's L1 knowledge has as much influence on the learning of an unrelated second language as on the learning of a related one', it just takes different forms. Transfer to somewhere is predominantly positive, and is particularly clearly manifested in comprehension and across languages perceived to be similar, whereas transfer to nowhere mostly corresponds to negative transfer or interference in learner production and across distant languages.

The somewhere/nowhere debate illustrates the possibility of looking at transfer from two points of view, both of them perfectly justifiable. The differences can be explained by researchers focusing on different types and aspects of transfer. An attempt to rephrase the issues placing them in a wider context, including communication and learning, comprehension and production could be something like the following:

Transfer as a communication process is the use of perceived and assumed cross-linguistic similarities in L2 comprehension and L2 production. It is natural to perceive similarities across closely-related languages, and they are especially frequently employed in comprehension. Formal similarity of items as well as functional equivalence of categories are relevant for the extent of perceived similarities in comprehension. Where similarities cannot be perceived, as in production and in comprehension of very distant languages, they are merely assumed. The learner assumes that L1 forms and L1 procedures are relevant and helpful for L2 production but, when similarities are merely assumed, without prior perception, there is a considerable risk of errors.

Transfer, or cross-linguistic influence, as a learning process is what transfer as a communication process may result in: it means that L1 items and L1 procedures have become or are becoming part of the learner's interlanguage system.

## **Cross-linguistic Similarity and the Mental Lexicon**

The question how the mental lexicon of a bi- or multilingual is organised has been discussed in a variety of contexts (for some recent contributions, see, for example, Cenoz *et al.*, 2003; De Bot, 2004; Kroll & Dijkstra, 2002; Singleton, 1999). Not all that much has been said about the relevance of



cross-linguistic similarity to the representation of words in the mind, but what Paradis (1987: 16) said almost 20 years ago no doubt still holds true: 'The less two languages have in common, the more they are represented separately'.

Word association tests provide evidence of what type of words are most closely linked with each other in the mind. In these tests a subject is asked to say the first word that comes to mind when presented with a stimulus. Tests with native speakers have shown considerable stereotypy: adults reacting in fairly predictable ways to the stimulus words, with little variation (Postman & Keppel, 1970). There are basically two types of responses, syntagmatic (*door* as a response to *shut*) and paradigmatic (*chair* as a response to *table*), the latter being generally more frequent than the former. Young children seem to prefer syntagmatic responses, and they differ from adults above all in that they also produce a fairly large number of 'clang associates' (*but* as a response to *butter*) (e.g. Ervin, 1961). These are words phonetically similar but without a semantic or syntactic relation to the stimulus word. Native speakers thus appear to show some development in the organisation of their mental lexicon: as maturity and L1 proficiency increase, words appear to be organised in the lexicon more and more by content, not by form. Several other researchers have arrived at the same conclusion.

Word association tests have also been used with foreign language learners (Meara, 1978, 1982; Schmitt & Meara, 1997; Söderman, 1993; cf. Singleton & Little, 1991) to clarify whether there might be differences between native speakers and learners in the organisation of their mental lexicon. Non-native subjects do not respond to L1 stimuli in quite the same way as native speakers, but they show similarities to native children. They are often influenced by the phonological or orthographic form of the stimulus word ('clang responses') and they also show more variation from subject to subject in their responses. Söderman's study analysed Swedish-speaking subjects in Finland at four different proficiency levels and found that there was a steady development from clang and other unusual responses to syntagmatic and especially paradigmatic responses. Responses by the highest proficiency level (university students of English) in Söderman's subjects show that the distributional pattern still does not quite reach native speaker level, but 'the more proficient a learner gets, the stronger the words are integrated in his lexicon and the fewer unusual responses will he produce' (Söderman, 1993: 149). Non-native development thus parallels native development in that the organisation of the mental lexicon on the basis of phonological similarity is gradually being replaced by a more semantically based organisation. However, Söderman

also makes the point that the frequency level of the stimulus words plays an important part in the test. With high-frequency words there was hardly any difference between native speakers and advanced learners, while learners produced significantly more unusual responses, mostly based on purely formal similarity, than native speakers when the stimulus words were infrequent. Word frequency is thus a highly relevant variable closely interlinked with the learner's proficiency level. Lowie and Verspoor found for Dutch learners that:

the degree to which L2 prepositions are similar to prepositions in L1 only affected the scores if these prepositions were not very frequent: for the frequently occurring prepositions no effect of similarity (i.e. transfer, HR) was found. The explanation for this finding would be that subjects tend to rely on their first language only for the more unfamiliar prepositions ... This interaction did not occur at the highest proficiency levels: these students had been sufficiently exposed to the L2 to develop full representations for all prepositions. (Lowie & Verspoor, 2004: 89)

Another area of research that reveals differences between native speakers and advanced learners is studies of reaction time in grammaticality judgments (e.g. Alanen, 1997).

Formal similarities, phonological and orthographical, have an essential role in the organisation of the mental lexicon, especially at early stages of learning. These similarities may be predominantly cross-linguistic or predominantly intralinguistic, with the proportion being determined largely by the distance perceived between L1 and L2 and by the proficiency of the learner. As learning progresses, the learner relies less on phonological similarity and more and more on semantic similarity, with advanced learners approaching but not quite reaching the native speaker's setup, which is primarily semantically organised. A few conclusions can be quoted from the many studies providing support for the development from form to meaning in the learner's mental lexicon: 'Formal processing does come prominently into play during the early acquisition of a given L2 lexical item, but such processing predominates only where semantic processes find no avenue for the making of semantic connections' (Singleton, 1994: 54). 'Lexical units are increasingly progressed *qua* meaning rather than *qua* form as their integration into the mental lexicon progresses' (Singleton, 1999: 189). 'Increasing fluency in the second language is associated with a reduction in reliance on form and an increase in reliance on meaning' (Kroll & de Groot, 1997: 174). See further, for example, Albert and Obler (1978: 57); Henning (1973); Joannopoulou (2002: 40); Meara (1978).

## Notes

1. On the basis of a similar word formation occurring in L1, a Danish learner correctly produced the German compound *neusprachlich* without ever having come across it before (Faerch & Kasper, 1987: 128ff.). However, this cannot be taken as evidence for production preceding comprehension, since both elements of the compound must have been in the learner's L2 repertoire from before. Cf. what D. Ingram (1974: 316) says about grammar, 'Some comprehension of a specific grammatical form or construction occurs before it is produced.' Eckman (1981) makes the point that this may not always be the case in phonology, but the relation between the motor-perceptual skills of sound recognition and sound production may be different from the overall skills of language comprehension and production.
2. The relation between receptive and productive aspects of foreign language vocabulary has been discussed by Melka (1997) (see also Meara, 1990, 1997). Asymmetry between comprehension and production not only appears in lexis, it has also been found in phonology, as an early study by Nemser (1971) showed.
3. Flynn (1986: 135): 'Production tests principally evaluate a learner's developing structural competence in the L2. On the other hand, comprehension tests provide a less direct measure of structural competence and are significantly influenced by pragmatic context.'
4. Some studies have found that there is more interdependence, mutual dependence between L1 and L2 in comprehension than in production (Bergh 1986; Kolars, 1966). The consequence of this is that there is more transfer, more use of cross-linguistic similarities in L2 comprehension than in L2 production.