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The study of L1 attrition is currently entering its third decade. However, after twenty years of diligent investigation resulting in numerous theoretical and empirical papers the questions on this topic still greatly outweigh the answers. Findings from individual studies seem to indicate that it cannot even be said with any certainty *whether* an L1 in which a certain level of proficiency has been reached can ever undergo significant attrition, let alone *how* or *why* it might.

There are many reasons for this failure to arrive at a more integrated and explanatory framework. Some are theoretical, some methodological, and some are linked to communication or lack thereof between individual researchers. These were the problems that our conference, this volume, and subsequent work have been trying to address. A further problem is, of course, the extraordinary complexity and multi-facetedness of the phenomenon of language attrition. It is our belief, however, that this last issue cannot even begin to be tackled unless the first three have been solved.

This chapter will attempt to identify and clarify these issues, in order to establish the starting ground from which the individual papers will proceed. The first section will give a chronological overview of how the field of language attrition has developed over the past two decades, try to identify the concerns and forces that have shaped it, and point out developments and changes. The second section introduces those extralinguistic factors that have been shown to play important roles in attrition. The third section presents an overview of theoretical frameworks within which language attrition studies have been conducted, while the fourth section focuses on questions of research design. The final section is an outline of the structure and contents of this volume.

1. A historical overview

The topic 'language attrition' seems to exercise a strange fascination. The question of whether an individual can really forget an L1 or L2 once learned, and how and why this 'loss' might proceed, is an intriguing one. One could even go so far as to say that most people would intuitively describe themselves as 'attriters' – "I took Spanish in school for three years, but I've forgotten it all". Especially fascinating are questions about the nature of memory and the possibility of reactivating a forgotten language system, e.g. under hypnosis. This fascination was also at the root of the beginning interest in language attrition in the early 1980s – Richard D. Lambert, one of the organizers of the 'inaugural' UPenn conference "The Loss of Language Skills", and co-editor of the subsequent conference volume (Lambert & Freed 1982), describes his interest as "both personal and professional". Having studied a variety of foreign languages, ranging from a number of standard Indo-European ones to Urdu, Bengali, Sanskrit and Marathi, and having achieved fluency in at least some of these, he found that his proficiency was decreasing through the course of the decades (Lambert p.c.).¹ Such reports of a feeling, based on introspection, of erosion in a first, second or foreign language seem very frequent among language attrition researchers. On the professional level, too, interest in language attrition often seems to have been initiated by experiences with FL students who had devoted a substantial amount of time trying to achieve proficiency which they subsequently lost:

To a considerable extent, the large amount of time spent learning an Indian language was wasted. And this problem was not limited to students of Indian languages, but was more widespread throughout the field of area studies. I had conducted two major national surveys of university-based language and area studies [...]. The survey showed that the problem of language skill loss was endemic to African, East European, Far East, Middle East, South Asian, and South East Asian studies as well. (Lambert, p.c.)

This observation, coupled with a paucity of published literature, motivated Lambert to organise a national stocktaking conference which “might turn up more information and perhaps help establish an area for future research in the field” (p.c.). The study of language attrition was thus inaugurated in a very teleological and conscious way, certainly a rather unusual procedure for a research topic. Unusual it might have been; effective it no doubt was. *The Loss of Language Skills* (Lambert & Freed 1982) was a benchmark publication that, two decades later, has lost none of its importance and relevance to current research. It not only covers the issue of (first and second) language loss from every conceivable perspective, taking into account issues such as language shift/death, pathological language loss, social and political factors, but it also contains, in a methodological section, the groundbreaking papers by Andersen, Oxford and Clark. Of these, Andersen’s paper, in particular, is worthy of far more consideration than it has, so far, received in language attrition research, since it provides an outline of a set of preliminary assumptions and testable hypotheses and thus draws up a blueprint for research. Both the conference and the publication thus took it upon themselves to provide an emerging field with theoretical and methodological frameworks as well as background information from neighbouring disciplines.

At this point, the study of language loss research branched out across disciplines and countries. In the USA, the Language Skills Attrition Project (LSAP, see Ginsberg 1986) was founded in an attempt to compile an archive of foreign language attrition tests and data in the less commonly taught languages Chinese, Japanese and Arabic. The aim of this project was

(...) to measure the language competency at the end of their training of a cohort of students in the AOLC’s [Advanced Overseas Language Centers, BK & MSS] in Cairo, Taipei, and Tokyo, then measuring their proficiency again at yearly intervals after their return to the United States (Lambert, p.c.).

The methodological problems involved in developing a roughly equivalent set of tests across these languages, investigating features that were assumed to be vulnerable to attrition, were immense. Unfortunately, very little has been published on how these tests were designed, and what the outcome of the pilot studies were (the only available reports are Lambert & Moore 1984, 1986). Lambert himself describes them as “not substantial enough to help much in the development of the new field of language skill attrition. Nor, unfortunately, were the students’ competencies measured after a lapse of time as originally planned.” (Lambert, p.c.) Meanwhile, the Pennsylvania conference had inspired interest in Europe, and specifically in The Netherlands. A personal link developed between Richard Lambert and Theo van Els, leading to the organisation of a two-day workshop with participants from the US and The Netherlands at Nijmegen University in October 1982. A number of European projects were thus set in motion (van Els 1986: 3). The ‘Dutch contingent’ introduced several new concepts to this developing field. Researchers had begun to feel that the microlinguistic approach put forward so far was lacking in theoretical depth, and that language attrition had to be seen not

merely as a linguistic but also as a cognitive process, and thus an integral component of language acquisition (Bert Weltens, p.c.). A further important consideration was that the research strategies and models which had, so far, been used in large-scale projects on language shift had to be incorporated into the typically small studies of individual loss. In other words, it was hypothesized that attrition could not be studied in isolation from its social context. It was via this angle of interest that questions about linguistic minorities, migrants, and the attitudes of the surrounding dominant society entered the field (Sjaak Kroon, p.c.). These efforts eventually led to the *Language Loss Symposium* held in Kerkrade (near Maastricht, NL) in 1986. The proceedings of this conference (Weltens, de Bot & van Els 1986) are discernibly different from Lambert & Freed. Where the earlier volume had contained a collection of papers that were largely if not exclusively theoretical-methodological, the 1986 volume presents only a few methodological papers – which, furthermore, are clearly the outcome of preliminary reflections on a very specific research project to be undertaken – augmented by a number of reports on pilot studies or work in progress. The 1986 volume furthermore attempts to span the gap between language shift, dialect death and L2 attrition, contributions on individual L1 attrition still being notably absent.

These early years witnessed a mere handful of investigations of L1 attrition which – in contrast to the studies that emerged from the dense network described above – were apparently conducted and published in relative isolation, such as Sharwood Smith (1983), Hiller-Foti (1985), Bettoni (1986) and Py (1986).

The next big surge in publications was to be witnessed in 1989, when two journals devoted a special issue to language attrition: *Studies in Second Language Acquisition* 11:2 (ed. by Andrew Cohen & Bert Weltens) and *Review of Applied Linguistics (I.T.L.)* 83-84, comprising papers presented at the Language Loss Symposium held at the *World Congress of Applied Linguistics* at the University of Sydney, 1988. Both collections witness a further shift in balance from exclusively theoretical to applied papers and towards L1 attrition in an L2 environment. These two volumes are a good indication of the type of research that was being conducted at this time. Most papers are short preliminary, in-progress, or concluding summaries of projects, pilot studies or PhD-studies (some of these projects, unfortunately, were abandoned before completion).

The next, and – thus far – last collection of papers that explicitly limits itself to language attrition, in this case even narrowed down to L1 attrition, is Seliger & Vago (1991). This is the first collection that was not the outcome of some kind of meeting of researchers. The editors – both of whom had also become interested in the topic through personal experience – contacted potential contributors directly (Robert Vago, p.c.), which is a testimony to the fact that the field was beginning to establish itself. Rather interestingly, although this volume is the first collection of papers to proudly carry the term ‘attrition’ in its title, few of the reported studies actually deal with this phenomenon in the strict meaning of the term – the non-pathological decrease in proficiency in a language that had previously been acquired by an individual, i.e. intragenerational loss. Apart from a number of theoretical papers, Seliger & Vago contains several papers on language shift and death, as well as one on aphasia. In addition to that, there are five case studies on the attrition of one (in one case two) subjects, and only three larger studies – with between 6 and 30 subjects – are reported on.

This volume ushered in the nineties, a decade that witnessed the disciplines of L1 and L2 attrition drifting apart. L1 attrition, by and large, seemed to be content to be a subfield of the larger ‘Maintenance and Loss of Minority Languages’ area, on which a series of conferences were held in The Netherlands between 1988 and 1998 (see below). It is symptomatic that in 1998, Kees de Bot pointed out in exasperation – and doubtlessly not for the first time – that he and Bert Weltens were the two only ‘knights’ in pursuit of the shining goal of terminological

distinction between *Shift* (intergenerational) and *Attrition* (intragenerational) as hyponyms of the more general *Loss*.² L2 attrition, on the other hand, became more and more firmly established within the field of foreign language teaching. This division in ‘affiliation’ impacted very heavily on the methods of data elicitation, testing, and analysis used by the two fields, which eventually made comparisons between individual studies virtually impossible. The loss of close links was not, however, confined to the two branches of the discipline. The personal ties between most researchers working on the narrowly confined field of language attrition that had characterized and shaped the eighties also ‘attrited’. If we take Seliger & Vago to be the transitional point between the decades, it is very noticeable that hardly any of those names that had been so prolific in the eighties recur in the nineties (except, as e.g. in the case of Bert Weltens, as PhD supervisor – i.e. not themselves actively involved in research on the topic). The major exception is Kees de Bot, who can be described as the only constant in this quickly changing field – and the single force that held it together during the next decade. Where L1 attrition is concerned, the nineties were the decade of large but solitary studies. While the eighties had posed interesting questions, a great proliferation of short papers hoping to find quick and easy answers, towards the end of the decade a sobering effect had set in, as researchers realized that it might all be far more messy than they had previously thought. On the other hand, a large enough body of theoretical work was now available to make the topic attractive for PhD studies. Fig. 1 illustrates the development of articles and PhD dissertations in relation to each other.

(insert Fig. 1)

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It is evident how the past decade, in particular the past five years, has witnessed an astonishing increase in dissertations while over the same span of time, the number of articles published has remained relatively stable (many of these latter publications, however, are exclusively theoretical treatises in handbooks or encyclopedias). Language attrition research was thus characterized by the solitary existence of the PhD-student, spending a large part of her time doing fieldwork and, typically, having little opportunity and less money to go to conferences and make contacts in the international scientific community. Unfortunately, many of these PhD-dissertations are not easily available,⁴ which means that, while much work - and good work – was being done on language attrition in the 90s, many researchers could not draw on each other’s work, and the field lost most of the overall coherence and collective impetus it had begun to enjoy in the decade before. In addition to that, many researchers who were doing a PhD during this period abandoned the topic (if not the profession) after completing their dissertation.

It is hard to say whether this ‘individualization’ of language attrition research was the cause or the outcome of the fact that the frequency of conferences or workshops specifically dedicated to language attrition also decreased sharply within this period. The political climate, which made it possible to obtain very generous funding for activities on language loss, necessitated the link between research on loss of indigenous and non-indigenous languages – upon which the field experienced what can only be called media hype. The first *International Conference on Maintenance and Loss of Minority Languages* (de Bot & Fase, 1991; Fase, Jaspaert & Kroon 1995, organised by researchers from the University of Tilburg in Noordwijkerhout (The Netherlands) was reported on in national and international TV programs and newspapers in 1988 (Kroon, p.c.). This great public interest diminished over the next decade, during which two more very successful conferences were held (in 1992 and 1998, see Fase, Jaspaert & Kroon, 1995; Klatter-Folmer & van Avermaet, 2001; Ammerlaan, Hulsén, Strating & Yağmur, 2001). At all of these conferences, L1 attrition was also represented, but the focus on a diminishing proficiency across one lifespan that had

commanded such interest in the decade before became fuzzier (see also the account of one of the organisers of the 3rd and, thus far last, such conference, Kutlay Yağmur, this volume). It was only after the turn of the millennium that the field started to consolidate itself again. Workshops on L1 attrition were organised at international conferences - at the *Second Language Research Forum* 2000 in Madison, Wisconsin by Dorit Kaufman (see some of the papers in Bonch-Bruевич et al. 2001) and at the 3rd *International Symposium on Bilingualism* in Bristol, 2001, by Agnes Bolonyai.

In this situation we felt that it would be beneficial to the field of L1 attrition studies to provide a platform for researchers to exchange their findings, reflect on methodological issues, and engage in an intensive discussion of theoretical and practical aspects of language attrition research, in order to try and re-establish something approximating the close network of the eighties.

The following sections will attempt to clarify some of the issues that we found especially in need of attention in such a network.

2. Some basic issues in attrition research

Researchers beginning work on language attrition often seem disconcerted that, contradicting all their intuitions on the ‘undoubted’ and unquestioned existence of the phenomenon we label attrition, twenty year’s work has not yet been able to turn up unambiguous answers. This, however, is hardly surprising. The question “Can people forget a language?” bears, at least in one respect, a close resemblance to the Ultimate Question of Life, the Universe and Everything invoked in Douglas Adams’s *Hitchhiker’s Guide to the Galaxy*. Adams describes a race of “hyperintelligent pandimensional beings” who build a supercomputer whose task is to calculate the answer to this Ultimate Question – a task which takes the computer 7.5 million years to accomplish. Eventually, it comes up with the answer “Forty-Two”. The problem, as Adams points out, was that it had never been precisely specified what the question was in the first place. In the same way, the question “Can a speaker forget a language?” is imprecise, and therefore unanswerable as it stands, in various ways: there is, as yet, no workable and testable definition of language attrition – or of what would constitute evidence for its presence. However, the growing body of work provides converging evidence for at least some of the assumptions pertaining to what attrition might be, and how and why it might happen.

2.1 Extralinguistic aspects

Many attempts were made during the first and largely methodological decade to provide a precise terminological and taxonomical framework within which language attrition research could be conducted. The best-known (and most extensively quoted) of these is the division of the types of language attrition according to what language is lost (L1 or L2) and in what environment (L1 or L2) this loss takes place (first made by de Bot and Weltens 1985, but usually ascribed to van Els 1986).

Language lost	Linguistic environment	
	L1	L2
L1	Dialect loss	L1 attrition

L2	L2 attrition	Language reversion (in the elderly)
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Fig. 2: The ‘van Els taxonomy’

This split results in four possible types of attrition (see Fig. 2), of which two – reversion and dialect loss – have received relatively marginal attention.⁵ This is understandable, since including these two areas under ‘attrition’ causes a variety of problems of methodology, terminology, and data analysis. Language reversion is very difficult if not impossible to separate from the kinds of linguistic problems that are also encountered in the monolingual elderly (see Goral, in press). Furthermore, the informants under analysis in this type of L2 attrition most often are migrants who have never received systematic instruction in their L2. The problem of the point of reference – what was the L2 competence of the informant before psychosocial and/or neurolinguistic reasons connected with aging led to L2 attrition and reversion to the L1? – thus becomes impossible to deal with. The inclusion of dialect loss in a taxonomy of language attrition, too, causes many problems. Firstly, it has to be assumed that dialect loss typically is more similar to language shift than to attrition, i.e. it is something that happens inter- rather than intragenerationally due to incomplete acquisition (Kroon p.c.). Secondly, the distinction between an L1 and L2 environment seems, in this case, to hinge critically on the rather arbitrary and messy classification of whether two linguistic systems are two ‘different’ languages or ‘merely’ two different varieties of the same language. Nevertheless, the four-way taxonomy is invoked in virtually every study on attrition – perhaps because it is such a clear milestone in the development of the field, and such a (seemingly) neat and discrete way of carving it up, rather than because of its actual long-term impact in establishing subfields of ‘attrition’. Given the overwhelming focus of language attrition studies on L1 attrition in an L2 environment and L2 attrition in an L1 environment (as well as the fact that the significance of the very distinction between these two has recently been called into question, see de Bot 2002), we would propose, with respect, that this taxonomy may have outlived its usefulness.

That notwithstanding, there are other methodological distinctions that are clearly necessary, if an overall picture of attrition is ever to be gained. These have not, so far, been clearly established or respected. The most obvious of these concerns the difference between language attrition in *children* – i.e. the attrition of a linguistic system which has not yet stabilized – vs. attrition in *adult* speakers. Clearly related to this is the distinction of attrition among simultaneous, early and late bilinguals. The results from previous studies indicate that it is necessary to take into account both *age at the onset of bilingualism* (see e.g. the findings in Montrul 2002) and *age at the onset of attrition*. There is converging evidence suggesting that an L1 system can indeed be eroded to a quite dramatic degree if the attrition process sets in well before puberty (e.g. Bode 1996; Isurin 2000a; Isurin 2000b; Kaufman & Aronoff 1991; Nicoladis & Grabois 2002; Schmitt 2001, this volume; Seliger 1989, 1991; Turian & Altenberg 1991; Vago 1991). Similar findings were obtained for L2 attrition among children (Berman & Olshtain 1983; Kuhberg 1992; Olshtain 1986). Preliminary results from a recent study even point towards the L1 being lost to the extent that psycho- and neurolinguistic methods can detect no trace of it any more (Ventureyra & Pallier, this volume), while no study researching attrition among speakers who were above the age of twelve when input from the L1 was reduced has found anything remotely similar to such a drastic picture. Where such speakers are concerned, the prevailing impression seems to be that the amount of attrition present in the data is usually surprisingly low, even after many decades spent in an L2 environment. For those few studies which looked at both types of subjects (e.g. Ammerlaan 1996; Pelc 2001), age turned out to be the most important factor for prediction of

attrition. It has been suggested that the younger the child is when the language of her environment changes, the faster and deeper she will attrite; yet neither of these studies allows one to specify a precise age limit up to which attrition is more likely to occur.⁶ Whether this difference between children and adults is merely quantitative, or whether clear qualitative differences also exist between child and adult L1 attrition, has yet to be established, until which time extreme caution should be advised in transferring general observations from one area to the other (see also below, section 3.2).

Less categorical, but none the less important, distinctions will also have to inform language attrition research to a far larger degree than they have previously done. Among these is the *level of education* – an aspect that has been largely neglected so far, probably partly because it is very difficult to define in a discrete way in a multilingual and multicultural context. A further methodological problem associated with this factor is how to determine whether education level actually influences language attrition, or linguistic performance in general. In the first case, the education effect should be present only in the attriting group, whereas in the second case, similar effects would be observable in the control group as well, the groups with more education being better equipped to solve specific tasks. However, the fact that most studies which included education level among their extralinguistic variables determine variable effects across tasks suggests that the issue may be even more complex than that. Jaspaert & Kroon's (1989) pilot study on attrition among 30 Italian immigrants in The Netherlands, measured by scores on various language tests (vocabulary, text editing, sentence correction, and general comprehension as measured by a picture-sentence matching task), for example, showed education level to be the most strongly significant extralinguistic factor in the tests where evidence for attrition was found, namely the text editing and vocabulary test. Education level also influenced verbal fluency in the L1 in the findings reported in Waas (1996), while it was not a significant factor for her other analyses. However, Yağmur (1997), who treats education level as one of the main independent variables, found that performance on the same verbal fluency task was influenced by education level in both attriters and controls, with less educated subjects achieving lower performance levels across groups. Similarly, his informants with a higher education level (both attriters and monolinguals) performed much better on his relativization task, although a weak effect of education level on the attrition of this skill was also detected (Yağmur 1997:91).⁷ This finding, suggesting that education level can influence the capacity to carry out a sentence generation task, was corroborated by the results of the sentence-generation task in Köpke (1999), on which more educated subjects in both the experimental and the control group produced the target structure more often.⁸ Education level also influenced the judgement of ungrammatical L1 sentences among her bilingual subjects and proved to be one of the most important factors influencing attrition in this task, while on the other hand it had no effect on general discourse measures in a picture description task.

A slightly different approach is chosen by Pelc (2001), who measures education level on the basis of number of years of L1 (Greek) education prior to emigration and years of education in the US.⁹ The results show that the number of years of education in Greece correlates with linguistic performance – a finding which is probably related to the age effect she reports and may indicate a complex relationship between age, literacy and attrition (see below, section 3.2).

On the whole these findings indicate that the role of education level needs to be explored further, and certainly is an important factor which has to be controlled for, especially in attrition studies based on predominantly metalinguistic tasks (such as correction, editing, sentence generation, grammaticality judgements etc.).

A third factor generally assumed to play an important role in attrition is the *length of time* since the onset of attrition (cf. also Hutz, this volume). Preliminary psycholinguistic studies

suggest that immersion in a different linguistic environment leads to a change in language dominance, i.e. access to L1 gradually becoming slower than access to L2, without L2 competence necessarily being native-like. Empirical evidence suggests that such a reversal of language dominance may occur after a comparatively short period: answers in L2 were found to become faster than in L1 on a picture naming test after around 7 years (Lachman & Mistler-Lachman 1976; Mägiste 1979), while a lexical decision task produced a similar effect after as little as three years (Frenck-Mestre 1993). It has to be stressed that such a change in language dominance is not identical with attrition: differences in processing speed as measured in experimental tasks are hardly noticeable in normal speech situations, and the complexity of the relationship between two or more languages in the mind may well entail other consequences on language processing that are most likely to be fluctuating as a consequence of the bilingual's language use of the moment. Nonetheless, even if a reversal in language dominance is not necessarily followed by attrition, it is most likely that attrition is preceded by such a reversal and depends on time in a similar way. However, attrition studies investigating subjects with a period of residence of more than ten years generally find no or very little time effect (Ammerlaan 1996: 209; Bouba et al. 2002; Brown 2001:31; de Bot & Clyne 1994: 17; Gürel 2002: 170), and it has further been suggested that length of residence may only have an effect when there is little or no contact with the L1 (de Bot et al. 1991:94; Soesman 1997: 190). Köpke (1999) did find an effect of immigration length with respect to grammaticality judgements and picture description, but notes that this effect might be due to differences in the immigration length of the two experimental groups (English vs. French L2). Whether this implies that the question of whether the subject will attrite or not is determined in the period between roughly 5 to 10 years after immigration (as has been suggested in e.g. De Bot & Clyne 1994: 27) will, however, need further investigation. For the moment, it appears that the role of immigration length for attrition is not as important as generally supposed. This is also what is suggested by research conducted with very long-term immigrants, indicating that the L1 system can remain surprisingly stable even after many decades in an L2 setting (e.g. Hutz this volume; Jaspaert & Kroon 1992, Schmid 2002).

2.2 *Language attitudes, motivations, and use*

Far more crucial than the length of time appears to be the influence of *language use and attitude*. The latter feature in particular has proved one of the most slippery and difficult to measure factors in attrition research (see Schmid forthc. a). Attitudes, motivation and other affective factors have been shown to have a strong impact on language learning (e.g. Gardner & Lambert 1972) and, at least in some cases, possibly also on recovery patterns in polyglot aphasic patients (Minkowski 1928). Such factors have also been shown to play a role in multilingual community settings, so that it seems reasonable to assume that they might influence attrition in some way. The work of Pavlenko (2002) and Dewaele (this volume) further suggests that the bilingual's different languages may fulfill different emotional functions and that in some cases affective factors might influence the process of attrition. One of the earlier studies looking for a link was Waas (1996), who examined the influence of ethnic affiliation (via active membership in German clubs or churches, endogamous relationships, or use of the language at work) and citizenship (permanent resident vs. naturalized citizen) in German immigrants in Australia as attitudinal factors. Waas' study is largely based on self-report data, for which her classification yields the expected results – however, where she investigates actual linguistic performance, she detects no difference. This suggests that attitude, as measured by her study, influences self-perception but not actual proficiency, i.e. language attrition vs. retention.

Further attempts to operationalize this factor have been made within the framework of *Ethnolinguistic Vitality Theory* (EVT), a framework attempting to identify “that which makes a group likely to behave as a distinctive and active collective entity in inter-group situations” (Giles et al. 1977: 308). In other words, EVT comprises the factors responsible for the strength of the group’s identity feeling: status, demography, institutional support and control (see Hulsen 2000 and Yağmur, 1997 for a more detailed discussion of EVT in the context of attrition). Since language has a great symbolic value in a group’s identity, it can be supposed that strong ethnolinguistic vitality would prevent attrition. The findings from the two studies investigating the role of these factors with respect to L1 attrition are, however, not conclusive. Yağmur (1997, see also this volume), in his study on Turkish immigrants in Australia, found no correlation between subjective EV measures and linguistic performance, and neither did Hulsen’s (2000) study on Dutch immigrants in New Zealand.

Köpke (2000) attributed differences in the linguistic performance of two groups of German immigrants in Canada and France to differences in the sociocultural environment of the subjects, creating different attitudes and motivations with respect to bilingualism and language maintenance. Nevertheless, the design of the study (Köpke 1999) does not allow one to validate this hypothesis and the question needs to be further investigated.

However, despite the failure of sociolinguistic frameworks to account for attrition effects, the assumption of a link between attitudes and attrition still stands. Supporting evidence has recently been reported by Schmid (2002), who showed that exceptional settings (such as persecution) might generate emotional factors which influence attrition more strongly than any other extralinguistic circumstance. It is not clear yet to which extent adopted children may suffer from similar traumata, creating emotional factors eventually favoring the attrition of the L1 (e.g. Bode 1996; Isurin 2000; Nicoladis & Grabis 2002; Ventureyra & Pallier this volume). Attrition studies have to date merely scratched the surface of this complex and elusive phenomenon.

The factor *amount of contact with the L1* is a complex one in this respect, since it is often impossible to say to what degree it is influenced by attitude, or simply outside the speaker’s control for sociogeographical reasons, if there is no L1 speech community in the country of emigration and financial means do not allow travel home (see Jaspaert & Kroon 1989). The hypothesis that attrition can often be ascribed to lack of contact – more so than to the actual length of time spent in an L2 setting – has been corroborated repeatedly by direct (de Bot et al. 1991; Köpke 1999) and indirect evidence from studies that find less attrition than expected and ascribe this to the fact that their subjects still had substantial contact with L1 (e.g. Schoenmakers 1989). However, Jaspaert & Kroon (1989), who also found “much less language loss than we had expected” failed to find a correlation with language use (Jaspaert & Kroon 1989: 94f.). Contact thus plays an ambivalent role in previous studies, which may have to do with the methodological problems involved. More than with any other factor, measuring the frequency of use depends on self-report data which may be determined more by “how a person wishes to view herself than by an accurate assessment of her linguistic behavior” (Schmid 2002: 23). Furthermore, ‘contact’ is such a varied phenomena which can take place at varied levels – reading, email, telephone conversations etc. – that a unified research design investigating its impact seems a formidable challenge.

Attempts to assess this factor within a more rigorous framework were made on the basis of *Social Network Theory* (Milroy 1987), attempting to establish a link between attrition on the one hand and the multiplexity and density of the relationships an individual has contracted with other L1 speakers on the other (Hulsen 2001; Kipp 1999). Here again the findings suggest a complex picture. In Hulsen’s study, a larger number of L1 contacts in the neighbourhood even had a negative effect on the number of correct responses in the picture naming experiment (see also Köpke 2001, for an attempt to explain this type of observation).

2.3 Conclusion

Where extralinguistic factors in language attrition are concerned, we would thus propose that, in order to arrive at a stage where different L1 attrition studies can inform each other, it is necessary to take into account the following factors:

- age at onset of L2 acquisition (simultaneous/early/late bilinguals)
- age at onset of L1 attrition (pre-/post puberty)
- time since onset of attrition
- level of education
- attitudes
- frequency, amount and settings of use of the attriting language

The first two factors are easily established and discrete. The third one – time since onset of attrition – can also be considered relatively unproblematic. For the other three factors, however, no cross-cultural framework of classification and taxonomy exists as yet. We would suggest that these are the pressing issues of extralinguistic factors that language attrition studies still have to address over the next years (see also Schmid, this volume).

3. Explanatory frameworks

3.1 Linguistic issues

As with the predictor variables outlined above, research on the role of linguistic variables has so far suffered from the lack of dialogue between theoretical frameworks and applied research. It has been generally assumed that attrition is a selective phenomenon – a “rule-governed process” as pointed out by Seliger (1991: 28), which is why it is such an interesting field within linguistics at large. The search for underlying linguistic principles to explain the phenomena witnessed in language attrition must, however, be described as inconsistent and lacking coherence - even though there are individual studies that have adapted specific frameworks successfully to their data. Schmid (2002: 11) has identified four linguistic models that have so far influenced the interpretation of language attrition data:

- Regression
- Simplification
- Interlanguage
- Universal Grammar

The earliest frameworks which played a role in language attrition studies were not so much linguistic as cognitive-psychological in nature, dealing with the nature of processes of learning and forgetting. The earliest, most debated and most controversial one of these is doubtlessly the *regression* hypothesis, which plays quite a prominent role in the earlier speculative texts on attrition. This theory is based on the assumption that language loss in aphasia mirrors language development in the child. It rapidly became evident that this hypothesis does not hold with respect to aphasia, since this disorder is generally not progressive in nature and affects only parts of linguistic competence, depending not on internal linguistic factors, but on external factors, related to the kind of brain injury.¹⁰

However, as de Bot & Weltens (1991) point out, attrition is a gradual process and might thus be more likely than aphasia to follow the regression hypothesis.

The idea that attrition might be governed by a process that has its roots in the overall cognitive nature of memory, and only indirectly in the linguistic system (insofar as the order of acquisition of this system is also governed by the same principles), apparently was very compelling (studies within this framework are e.g. Brewer Bomar 1982; Jordens et al. 1986; Schmid 2002 (L1 attrition); Hedgcock 1991; Kuhberg 1992; Olshtain 1989 (L2 attrition)), especially at a time when research on attrition was very heavy on methodology and light on linguistic theory. Different versions of this theory have been put forward – one that is based on chronology ('that which is learned last is lost first') and one that is based on reinforcement ('that which is learned best, i.e. most often used/reinforced, is preserved longest'). However, although there is quite strong evidence from L2 attrition research for the regression process (Hansen 1999: 9), it has hardly ever been thoroughly tested in L1 attrition studies – instead, the mere idea has often been rejected out of hand. What little evidence there is seems to be conflicting (for an overview see Schmid 2002: 13f., see also *ibid*: 147f. about an interpretation of Schmid's own findings in the light of this hypothesis). In all fairness it would have to be said that the jury is still out on the regression hypothesis. A study that is being conducted at the moment (Keijzer in prep.) may eventually shed some more light on this.

The second 'framework' on the list is one that has very often been used in explanation of language attrition data – despite the fact that it cannot, in reality, explain anything. Within linguistic theory at large, the notion of '*simplification*' is, in itself, meaningless and only gains its substance within the confines of another theoretical framework, since the idea that loss of a particular structure of linguistic feature is determined by that item's complexity is valid only if an 'enforceable' definition is given. A random enumeration of what 'complexity' could refer to (and has been used to refer to in linguistic theory) includes synthetic as opposed to analytic structures, structures that are acquired late vs. structures that are acquired early, structures that take longer to process (or produce), structures that require many transformations etc. As Schmitt (this volume) points out, models will have to be developed and applied to attrition data that are more in-depth linguistic in nature – '*simplification*' or '*reduction*' is merely a label with no explanatory power.¹¹ Schmitt (and other recent studies) have attempted to operationalize this approach within the *4M-model* described by Myers Scotton and Jake (2000). This is a very recent innovation in language attrition research (see also Bolonyai 2002; Gross 2000, this volume) with rather interesting explanatory potential. A variety of the '*simplification*' approach is one that would assume attrition to follow the same principles that guide language change. An interesting finding in this respect is pointed out by Raidt (1997), who found features in L1 Dutch attrition in South Africa that were reminiscent of early stages of Afrikaans (Raidt 1997:232). According to Schmid (2002: 13), such processes might be expected in the following domains: reduction in registers due to reduction in functions; reduction of the lexicon affecting more specifically low-frequency items; and reduction in morphological complexity resulting in a more analytical language structure. What is essential is that language change - albeit observed in language contact settings – is *language internal*. It has to be noted that this framework is more often applied to morphology (Bettoni 1991) or morphophonology (Vago 1991) than to other linguistic domains, and that it is frequently used in studies that are concerned with intergenerational language shift or change (e.g. Bettoni 1991; or the studies reviewed in Maher 1991). Attrition is, however, generally not the consequence of lack of L1 use alone – as it would occur in the hypothetical desert island situation mentioned by Sharwood Smith & Van Buren (1991: 22) and de Bot (2001: 68). On the contrary, L1 is generally replaced by another language, and this language is often assumed to influence the process of L1 attrition.

Sharwood Smith's (1983) hypothesis that transfer is one of the most important processes determining attrition – the *interlanguage* or *cross-linguistic-influence (CLI) hypothesis* - has been adopted by a large majority of researchers in the field (Altenberg 1991; Grosjean & Py 1991; Gürel 2002; Isurin 2000; Leisiö 2001; Kaufman & Aronoff 1991; Köpke 1999; Major 1992; Pavlenko this volume; Pelc 2001; Seliger 1991, among others). It has been proposed (Seliger 1991: 237) that, in the absence of L1 input, L2 could be taken as a source of “indirect positive evidence”, and that as a result of this, “L2 rules which are formally less complex and have a wider linguistic distribution” will replace more complex and more narrowly distributed L1 rules serving the same semantic function (Seliger 1989: 173). Transfer from L2 undeniably plays some role in L1 attrition (see Pavlenko 2000 for a review), however, it surely is not the only source of linguistic changes in L1 attrition (e.g. Köpke 1999) and it remains to be elucidated in which cases the CLI hypothesis applies to attrition, and in which cases it does not. By analogy to what has been suggested by Seliger, Altenberg (1991: 203) claims that “L1 and L2 similarity is a necessary condition for transfer”. Experimental data increasingly point in that direction (e.g. Altenberg 1991; Köpke 1999; Pelc 2001) but it is not clear whether specific linguistic domains of L1, like the lexical-semantic domain for instance, are more susceptible to influence by the L2 than others, such as morphology for example. The impression that L2 influence has been more often documented in the lexical-semantic domain might be due to the fact that these aspects of attrition simply have been investigated more often. Additionally, in other domains, such as syntax, it might be more difficult to conclude whether attrition is more influenced by external (L2) or internal (simplification) factors (Schmid 2002: 13), since most attrition studies investigate an analytical language (English) as L2, making it difficult to impossible to determine whether attrition follows internal or external factors.

Given the strong predominance of theoretical approaches to L1 and L2 acquisition within the framework of *Universal Grammar (UG)*, it seems somewhat surprising that generative models have only relatively recently been applied to language attrition – all the more so since these models, due to their rigor, allow for hypotheses that are far more specific and testable than anything possible within the frameworks discussed above. Such predictions are generally based on the assumption of parameters which are fixed in the language acquisition process, and the questions that have been asked in L2 acquisition with respect to these models (can parameters be reset in L2 acquisition, and what other features – e.g. markedness – play a role in this?, see Clahsen & Muysken 1989) inform the approaches to L1 attrition within a generative framework. The role of markedness is ambiguous in this context, since from a theoretical point of view it has been predicted that ‘marked’ parameters in L1 might be reset to an unmarked value – on the other hand, the validity of this prediction is in doubt, since the setting of parameters is generally assumed to be conditioned by evidence from input, the lack of which is precisely what characterizes the attrition process (Sharwood Smith & van Buren 1991: 26). The assumption that a marked parameter may eventually revert to its unmarked setting, if evidence is absent, would thus suggest the need for ‘maintenance’ through reinforcement, which goes somewhat against the grain of parameter setting models. Among the linguistic features investigated within this perspective are the use of null versus overt pronouns in Italian or Greek versus English (Bouba et al. 2002; Sorace 2000), in Turkish versus English (Gürel 2002, this volume) and Japanese versus English (McCormack this volume) or the compounding parameter in Spanish versus English (Cuza, 2002). In these cases, L1 attrition attributed to L2 influence has been documented. More recently, based on findings which fail to detect such influence from L2 (e.g. Håkansson 1995), approaches within the Minimalist Program have speculated on the possible influence of another factor, namely that of [\pm interpretable], on language attrition (Montrul 2002, this volume; Platzack 1996; Sorace 2000). Such studies predict that features at the interface between syntax and

semantics (+interpretable) will be affected by attrition, while 'mere' morpho-syntactic features (-interpretable) will remain stable.

At the present stage of research, it seems likely that each of the linguistic hypotheses discussed above plays some role in L1 attrition. Kaufman (2001: 186) claims the coexistence of "(...) autonomous (language internal) processes [that] trigger regression to earlier developmental forms and integrative processes [that] generate forms that result from contact and interplay between the native language and the dominant language of the environment." In her study on L1 attrition in Israeli children in the US, Kaufman identifies several areas prone to attrition that can be qualified as an autonomous process, while other areas appear more susceptible to integrative processes.¹²

3.2 Psycholinguistic aspects

From a *psycholinguistic* point of view, it is hypothesized that insights into the internal reasons for language attrition might help gain a better understanding of the mechanisms underlying language processing and their interaction with respect to two languages that can be considered to be in competition.¹³ These aspects of L1 attrition have received little attention until now, despite the fact that the evidence available suggests that attrition may be psycholinguistic in nature (de Bot 2002).

One of the most important factors to be considered from a psycholinguistic point of view is age. As Kaufman (2001: 185) points out: "Attrition of L1 among older children and adults differs from the L1 attrition process among pre-puberty children." If there is one thing for which there seems to be ample converging evidence, it is that L1 attrition in children is much more severe than in adults (see above section 2.1).

To explain the influence of this variable, two possibilities must be considered. The first of these is that attrition might be influenced by the same factors which have led to the postulation of the *critical period hypothesis*, which assumes that, due to brain maturation constraints, L2 learning becomes more difficult past a certain age. With respect to L2 learning there still is no consensus on the existence of this critical period (see Harley & Wang 1997; Long 1993), the end of which Lenneberg (1967) initially assumed to coincide with the beginning of puberty (around age 12). It has since repeatedly been proposed that the line should be drawn earlier at least with respect to some linguistic levels. For phonology the critical period is generally assumed to end first, then for syntax and morphology, whereas the lexicon appears least prone to these restrictions. Since no consensus has been reached so far with respect to the existence and age limit of the critical period, Harley & Wang suggest that a more appropriate concept would be a "sensitive period" which declines gradually after the age of 6 or 7 years. With respect to attrition, the sensitive period hypothesis would imply that the easier it is for the child to learn L2, the more likely is it that she will forget her L1. The findings of empirical research so far strongly suggest that it takes a certain number of years for the L1 to be completely established in the human mind/brain, and that before this moment L1 can be easily replaced by another language (e.g. Nicoladis & Grabis 2002; Pallier et al. 2003; Ventureyra & Pallier this volume). It is not clear at what age the L1 can be considered to be fixed. Studies which comprise subjects for whom the onset of attrition can be situated before and after puberty (Ammerlaan 1996; Hakuta & d'Andrea 1992; Pelc, 2001) have found age to be one of the most important factors, whereas other studies that include only subjects who immigrated beyond puberty (e.g. Jaspaert & Kroon, 1989; Köpke, 1999) or at an older age (e.g. Schmid, 2002) do not find age effects (see section 2.1. above). The second possibility is that literacy plays some role in the resistance to attrition, as has been suggested by Olshtain (1986), possibly in interaction with age. The age limit up to which a very severe attrition process can set in for children – until approximately 8 or 9 years –

coincides with the time at which most children can be considered to have acquired reading and writing skills in at least one language (L1 or L2). Not only do these skills allow further contact with the language in case of migration (via books, written correspondence, etc.), it is also possible that they facilitate ‘fixing’ the language in the brain, adding another network (see Köpke in press for a more detailed discussion). Indeed, psycholinguistic models of the lexicon generally assume the written code to constitute a supplementary set of linguistic representations in the lexicon, be it in the form of independent modules (Caramazza 1988; Caramazza & Miceli 1990; Morton 1969) or in the form of new connections added to the existing oral representations (e.g. Grainger 1993).

In addition to these complexities, it seems likely that the ‘fixing’ of the language in the brain is not purely dependent on biological factors like brain maturation and a sensitive period (if such a period could be established), but is also determined in interaction with factors of identification and emotion (see section 2.2 above).

Another question to be asked within the psycholinguistic perspective is whether a language (and *a fortiori* an L1) can be truly lost (i.e. erased from memory), or only become more and more inaccessible (cf. Sharwood Smith & van Buren 1991: 17). Fromm (1970) reports the case of a 20-year old man who rediscovered a forgotten childhood language under hypnosis – and was no longer able to understand what he just said in that language once awake.¹⁴ Such cases would suggest that there is no true forgetting (in the sense of the disappearance of knowledge): things (and languages) only become inaccessible once they are no longer needed.¹⁵

The first scholar to look at attrition from that point of view was Sharwood Smith, who drew attention to the necessity of taking into account the distinction between *competence* and *performance* with respect to attrition data as early as 1983 (Sharwood Smith 1983a). Attrition at the level of competence concerns underlying linguistic competence and entails a restructuring of what is known about the language (cf. Seliger 1989; Grosjean & Py 1991). At the level of performance (or processes), attrition results in difficulties in control of that knowledge (which may remain intact) (Ammerlaan 1996: 18). Performance attrition can be supposed to yield two types of phenomena.

The most common manifestations are *word finding difficulties*, documented extensively by virtually any attrition study addressing this question (Ammerlaan 1996; Köpke 1999; Olshtain & Barzilay 1991; Waas 1996; Yağmur 1997).¹⁶ The clearest demonstrations of this ‘disorder’ can be found in Ammerlaan (1996) and Hulsen (2000) whose studies are based on a psycholinguistic design allowing a differentiation between productive and receptive language skills with respect to the lexicon: both use a picture naming task to test lexical retrieval (active retrieval of a lexical item from memory) and a picture-word-matching task for testing lexical access (‘passive’ activation of an item by an external stimulation). The results show that accessibility of the lexicon is clearly reduced, as evidenced by difficulties in the picture naming task (which are quite extensive in the case of the Ammerlaan study), whereas receptive skills measured in the matching task are less impaired (or even perfect in the case of the Hulsen study with respect to first generation immigrants).

However, lexical retrieval problems are not the only manifestation of performance attrition. *Processing difficulties* can be expected in close relation with the cognitive demands of the tasks used for data collection (cf. Dussias 2002). Due to changing dominance patterns between the two languages, subjects may find it more and more difficult to inhibit the L2 while using the L1 in order to prevent interference. This inhibition will then consume resources (Green 1986) which will be withdrawn from other levels of processing. At this point, nothing is known about this kind of mechanism in relation to attrition, but the few studies that do allow a comparison of performance across tasks find variability in performance across all linguistic levels. For lexical retrieval, such variability was found in

the studies described above (Ammerlaan 1996; Hulsen 2000), but similar findings have been reported with respect to phonetic measures (Major 1992) and morpho-syntactic processing (Köpke 1999). Köpke's findings on this last point indicate that structures which are prone to errors in a sentence generation task generate even more errors in a grammaticality judgement task. The issue of performance variability is in obvious need of further investigation, variability in performance suggesting strongly that L1 attrition among adults is, in most cases, an issue of processing difficulties (see also de Bot, 2002).

Sharwood Smith further suggests that the competence/performance distinction he assumes for attrition may evidence itself in three distinct stages (Sharwood Smith 1983b: 51). The first stage would be characterized by systematic deviations in performance while competence remains stable. Stage II is described as a transitional period where the bilingual is in possession of a new (contact) variety, but preserves the ability to switch back to the old variety when required by the circumstances. Stage III would involve the emergence of a new competence – possibly a reduced one, characterized by a decrease in structures available to the speaker, but conceivably also an enriched one, where the repertoire has been changed in line with universal grammar.

While there is as yet no evidence for such a restructured linguistic system among adult speakers, Stage II can be illustrated by data from Major (1992), the only attrition study focussing on phonetics. Major reports that in spontaneous speech, some subjects in this multiple case study produce Voice Onset Times (VOTs) in L1 (English) which are no longer native-like and clearly influenced by L2 (Brazilian). However, in a more formal read-aloud task, the same subjects produce more native-like VOTs. Further studies combining formal and casual speech are clearly called for to establish whether such a co-existence of varieties is confined to phonetics, or whether it can be observed in a similarly systematic way on other linguistic levels.

A third psycholinguistic framework that attrition research has to take into account concerns the notions of *activation* and *inhibition*, which are directly related to the *frequency of use* or *reinforcement* of a linguistic system or of a particular linguistic item/structure. An early proposal (Andersen 1982) was that low-frequency items would be more vulnerable to attrition, and this assumption has been validated by experimental data since, at least with respect to lexical retrieval (cf. Ammerlaan 1996; Hulsen 2000; Schmid forthc. b). From a psycholinguistic point of view, this phenomenon can be explained within the concept of activation, which has become very popular with the development of connectionist models since the beginning of the eighties. Activation and inhibition mechanisms, on one view, appear to account for the control of multiple languages in the brain (Green 1986; Paradis 1993) as well as for changing dominance patterns. The Activation Threshold Hypothesis assumes that items (or languages) that are more frequently activated need less stimulation to be reactivated than items (or languages) that are less frequently activated (Paradis 1985, 1993, 2001). Within this framework, attrition is thus predicted in the form of reduced accessibility as a natural consequence of lack of language use. However, it is only recently that the Activation Threshold Hypothesis has been applied to language attrition data (Köpke 1999, 2002; Gürel in press).

Further psycholinguistic approaches to language attrition are clearly called for, in order to shed some light upon important methodological issues, such as a more comprehensive understanding of the implication of age at attrition onset,¹⁷ a better knowledge of task demands and their implications for the study of attrition (see below, section 4), or a better understanding of frequency effects in the context of attrition.

It is nevertheless striking that all sociolinguistic factors which have so far been established as bearing on the attrition process seem to have psycholinguistic consequences:

- a. *Education level*: A higher education level can be supposed to lead to more explicit knowledge of a language, which will make interference with implicit competence less likely¹⁸
- b. *Age of departure*: In accordance with the sensitive period hypothesis, attrition data suggest that the younger a child is when she changes her linguistic environment, the higher the probability that the L2 will replace the L1.
- c. *Contact with L1*: the amount of contact has direct consequences on frequency of activation of L1, and thus influences the psycholinguistic balance between the two languages.

3.3 Conclusion

The outline of the predominant models applied in language attrition studies presented above suggests a recursiveness in theoretical considerations. These started from cognitive aspects with the regression framework, then moved towards increasingly more rigorous assumptions based on various aspects of the linguistic systems themselves, only to eventually arrive back at cognition and psycholinguistic aspects of language processing. This development in theoretical approaches is also evident in the interest curves associated with these various frameworks within applied language attrition studies.

Insert Figure 3

The picture presented by this overview is a heartening one, since it suggests a growing tendency to apply theoretically more rigorous models (evident, for example, in the move from 'simplification' to the 4M-model), and also an interest in psycholinguistic aspects. Based on this, our prediction is that language attrition will be an interesting field to watch as it develops over the coming decade(s).

4. Practical concerns: research designs

An important explanatory factor in the context of the wide variety of results reported in language attrition studies is the nature of the data on the basis of which 'loss' was assessed. This is a factor with two-fold importance, one concerning the way in which the data was elicited and the other the phenomena within these data which were selected for analysis. A clear differentiation between elicitation designs seems all the more important for attrition research, since the evidence found in research on pathological populations - among which the deficits can be expected to be much more severe - showed that performance is dependent on task demands (e.g. Waters, Rochon & Caplan 1998). There is abundant evidence that the way a specific linguistic structure is elicited may impact very heavily on the amount of 'errors' an individual produces, particularly in linguistic situations that are in some way 'problematic' (aphasia, agrammatism, dementia, etc., cf. Penke 1998; Waters et al. 1998). However, none of the existing studies on language attrition have discussed the methods of elicitation used or considered the suitability of the task to detecting problems in language production which are the outcome of the attritional process. There is furthermore a great amount of variation in the research designs and elicitation techniques. This variation is to a large degree conditioned by the discipline within which the individual research is conducted. This split is most evident in the differences between L1 and L2 attrition research which, as was noted above, drifted apart in the 1990s. Since that time, L2 attrition research has predominantly focussed on tests typically used for L2 acquisition studies, whereas L1 attrition has often tended towards the broader survey techniques as applied by sociolinguistic approaches on multilingualism and minority languages.

There appear to be three larger categories of data elicitation techniques in L1 attrition research. The first one is to invite self-assessments (typically Can-Do-Scales), the second involves ‘formal’ tasks targeted at eliciting the linguistic structure or phenomenon of interest, and the third attempts to stimulate data that are as close as possible to ‘natural’, i.e. unobserved, spoken data.

Self-assessments have to be considered a rather slippery factor in measuring language attrition (for a discussion see Hulsen 2000: 24), although there does appear to be increasing evidence that they can be a relatively good predictor of L1 attrition as measured by more formal tasks. Various studies, using Can-Do scales similar to the ones originally devised by Clark (1981) find that self-assessments correlate with the linguistic scores achieved (Hulsen 2000; Yağmur 1997¹⁹) – it has to be added, however, that self-assessments have also been found to be influenced by attitudinal factors (Hakuta & D’Andrea 1992:90). We would maintain that the usefulness of this type of data for studies investigating the (psycho)linguistic processes governing language attrition is doubtful – the insights (if any) to be gained from this kind of test being purely sociolinguistic.

In the category of formal elicitation techniques we find a wide variety of tasks, the most frequent type being some kind of judgement task on semantic or morphosyntactic features (Altenberg 1991; de Bot et al. 1991; Gürel 2002; Grosjean & Py 1991; Jordens et al. 1989; Köpke 1999; McCormack this volume; Münstermann & Hagen 1986; Pelc 1998; Polinsky 1994; Seliger 1991). The correction tasks employed in some studies (Jaspaert & Kroon 1989; Schoenmakers 1998) can be considered a variant of the judgment task, since subjects have to judge the correctness of the linguistic material in order to correct errors. More recently, truth-value judgments (described further in Gürel this volume, and Montrul this volume) have been used within the generative approach. In order to test general comprehension, editing tests (Jaspaert & Kroon 1989; de Bot et al 1991) as well as sentence matching tests (Jaspaert & Kroon 1989) have been employed. Other tasks attempt to tap more specifically into the production skills on some linguistic feature, testing e.g. lexical retrieval via naming tasks to elicit isolated words (Ammerlaan 1996; Dugas 2000; Isurin 2000; Schoenmakers 1998; Hulsen et al. 1999) or words in context (Olshtain & Barzilay 1991), via matching tasks (Ammerlaan 1996; Hulsen et al. 1999; Schoenmakers 1998), or via fluency in controlled association tasks (Waas 1996; Yağmur et al. 1999). Productive morphosyntactic skills are generally tested through the instruction of inflecting a given word (or providing the relevant free morpheme) (Altenberg 1991; Bode 1996) or generating a certain kind of syntactic structure (Köpke 1999; Yağmur 1997).

This great variety makes overall observations about language attrition almost impossible, since findings from other fields of applied linguistics suggest variance for at least some tests. While, for example, the validity of fluency tests in assessing verbal retrieval difficulties (a test used frequently in attrition studies) has been demonstrated in adult aphasics (Goodglass & Kaplan 1983) and healthy elderly speakers (see Goral, in press), these tests were shown not to be an adequate tool to assess such difficulties in normal vs. language-disordered children by Hall & Jordan (1987), who conclude that “word-finding problems may be symptoms of a variety of language problems and therefore elude any single identification technique” (Hall & Jordan 1987: 109). Verbal fluency tests can thus not *a priori* be assumed to be a valid instrument in assessing adult non-pathological language loss, especially when they use only one or two domains (such as animals or fruit). It has also not been demonstrated whether the results of this and other tests correlate with difficulties the attriter encounters in the production of unguided discourse, but L1 acquisition studies suggest that elicited data often contain a number of errors which dramatically exceeds that found in free discourse (e.g. Clahsen et al. 1990: 112; Penke 1998).

The most controversial task in this context is certainly translation – a paradigm often used to assess language skills in shift/death studies (Dorian 1982; Dal Negro 2001; de Kadt 2001; Elordui 2001; Smits 1996) but recently also applied in language attrition (Ben Rafael 2001; Cuza 2002; Hirvonen 1995; Macevichius 2001; Polinsky 1994; Schoenmakers 1998). It is unclear what skills such tests attempt to measure, the activity of translation being a highly specialized one and not necessarily comparable to other kinds of linguistic activities (see also Yağmur, this volume). Furthermore, there are three practical reasons why we consider translation tasks at the very least highly problematic:

- translations have been shown to contain far more variation, and a far higher number of unacceptable structures than spontaneous conversation (Smits 2001: 315);
- the nature of the task makes it difficult to compare findings against an unattrited control group, since the distinction between attriters and active bilinguals is a complex one;
- translation tasks oblige the subject to activate the two languages simultaneously which may lead to interference, (cf. also Grosjean, 1998, for a discussion of the role of monolingual and bilingual modes on bilingual processing).

We would therefore suggest that controversies and debates on the validity of specific research designs have to be pointed out and reflected in any study using them.

Finally, a large number of attrition studies have attempted to stimulate their subjects into producing data that resemble spontaneous speech as closely as possible. This has been done by interviews of varying degrees of formality, or by eliciting a narrative on the basis of some kind of visual stimulus (pictures or films). This method of data elicitation seems compelling, since it attempts to measure attrition at the level at which it actually occurs, as against the largely abstract skills that formal tests aim at tapping into. However, the methodological concerns in working with free data are formidable, as the question of how to quantify any of the findings in such a setting remains yet to be settled (Schmid *forthc. b*), as does the question of how to address the issue of avoidance strategies.

Obviously the manner of data elicitation can only ever be evaluated alongside a fair consideration of the goals pursued, since they permit very different conclusions. Naturalistic methods are ideal for global approaches, aimed at measuring all aspects of performance, or for preliminary research in order to identify sensitive areas. More formal tasks, on the other hand, allow for better control of linguistic and psycholinguistic factors and should thus be applied in the investigation of specific domains. It should nevertheless be kept in mind that the means of data elicitation should be carefully chosen in accordance with the hypothesis to be tested.

That said, the application of the different tasks over the past two decades appears to have remained relatively constant (cf. fig.4), with one exception: recently, self-reports have been all but abandoned.

(Insert Fig. 4)

The second issue raised above with respect to research designs concerns the features of the data under observation which are actually used in the analysis. The study of language attrition has always been the study of deviance. The underlying and unquestioned assumption in practically any given study is that to measure ‘mistakes’ in attrited language – mistakes of production, mistaken grammaticality judgments, mistakes of grammar, mistakes of naming – is to measure the degree of an individual speaker’s attrition. Furthermore, in many cases no unattrited control group is used, so that the baseline for comparison is the tacit assumption of error-free homogenous native speech. The issue of ‘mistakes’ is discussed in detail in Schmid (*forthc. b*, this volume). Suffice it to say here that – methodologically or even fundamentally – this is a very problematic concept for (at least) three reasons:

- establishing if a certain structure is a mistake or not is highly difficult – ‘right’ or ‘wrong’ being anything but discrete;
- establishing a base-line for comparison in unattracted speech is equally problematic;
- the distribution of mistakes has to be correlated with the obligatory contexts, a comparison of the number of mistakes on two features is, in itself, meaningless.

We would thus strongly advocate that future studies on language attrition combine the analysis of ‘what went wrong’ with data on ‘what went right’ – while using data from all three categories described above, in order to make correlations possible.

5. Conclusion and outlook

All of these considerations motivated us to attempt to initiate a ‘next phase’ in language attrition research. We therefore published a call for papers for a three-day symposium, inviting participants to explicitly address one or more of the following questions:

Concerning data:

1. What is a ‘mistake’? How many judges do you need in order to establish whether something is a mistake or not?
2. What are the differences in the occurrence of ‘mistakes’ in elicited vs. spontaneous data? What methods are there available to generate elicited data that is more like spontaneous data?
3. Can a study of language attrition be confined to analysing interference data, or is it necessary to also include an analysis of ‘proficiency data’ (e.g. type-token frequencies, syntactic and morphological complexity etc.)

Concerning data collection:

4. What are the possibilities and limitations of different tests, i.e. what are the processing demands involved in a specific test and what kind of observations does it allow?
5. How does the procedure of data collection influence the results? (language choice, bilingual vs. unilingual interviewers, codeswitching during the test, etc.)
6. Is a control group necessary, and, if so, how do we establish one? (methodological differences here include the fact that a control group should, ideally, be unilingual – but that very often, choosing a unilingual group of subjects will produce an average level of education that is much lower than that of the group of attriters.)

Concerning sociolinguistic factors:

7. What extralinguistic factors (age, education, gender etc.) do we have to take into account?
8. To what degree do we have to allow for dialectal and sociolectal variation among our attriters, and how do we control for that?
9. How do we account for variation in the socio-cultural environment and/or history of the subjects and of its consequences on attitudes or motivation?

And finally:

10. If I could do the research all over again from the start, what would I do differently?

These were the central issues dominating the structure of the conference. The first day focused on issues concerned with theoretical frameworks, the second day on issues of data collection, and the last day on data analysis. A large number of issues and problems in connection with these overall topics were raised, while at the same time many researchers had the chance to present their research and findings to the community for the first time.

The purposes that we intended to achieve with this congress can be summed up as follows:

1. To arrive at a clearer, and more explicit, picture of the theoretical models that have been used to account for the findings in language attrition studies than is usually presented.
2. To achieve a better communication between researchers engaged in language attrition studies, in order to make it unnecessary for everyone to 're-invent the wheel' at the outset of their study.
3. To achieve a level of consciousness about the benefits and disadvantages of particular research designs and data elicitation methods.
4. To begin forming an international network of attrition researchers.
5. To achieve communication between 'established' scientists and young researchers who are starting out in language attrition studies.

We are pleased to state that, on all of these topics, great progress appears to have been made during the symposium. Specifically,

1. In the course of the presentations, issues in connection with theoretical models such as the regression hypothesis and the Basic Variety in L2 acquisition (Jordens), Universal Grammar (Montrul), language contact (Muysken), dialectology (van Hout), psycholinguistics (Ventureyra), sociolinguistics (Jääskeläinen), social networks (Kipp) – among others – were raised.
2. The presentations and discussions, both formal and informal, as well as the connections formed and friendships struck at the conference gave all of the participants a good overview of the state-of-the-art in current research.
3. Both presentations that explicitly focused on the merits and disadvantages of specific elicitation methods (Altenberg & Vago, Schmid) and presentations and discussions about individual research projects (Hutz, Latkowska, among others) greatly contributed to the overall understanding of problems concerned with specific research designs.
4. It was unanimously considered desirable to have follow-up events, such as further conferences, an internet discussion list (which has since been installed, and to which many of the conference delegates as well as researchers who were unable to attend have already subscribed), and a language attrition website (in development on the server of the Vrije Universiteit).
5. As a follow-up, a graduate workshop took place at the Vrije Universiteit in January 2003, under the auspices of Kees de Bot and Monika S. Schmid. Overall, the strong presence of young researchers working on an MA (Leppanen, Weilemar), just starting a Ph.D. (Dostert, Jääskeläinen, Keijzer, Opitz, Prescher, Thuss), or just having finished a Ph.D. (Gross, Gürel, Pelc, Schmitt) as well as that of established scientists (de Bot, Dewaele, Dussias, Jordens, van Hout, Muysken, Pavlenko, Vago) was one of the strongest and most beneficial aspects of the congress.

The papers included in this volume fall into several groups. The first part focuses on *theoretical and methodological issues of data collection and analysis*, beginning with Pavlenko's contribution on the difference between L2 influence on L1 on the one hand and L1 attrition on the other. This issue is a crucial one, since it is generally assumed in attrition studies that all cases of interference are due to attrition, without taking into account that interference may occur in 'normal' bilinguals as well. Jiménez Jiménez and Dewaele both present innovative approaches to the study and analysis of attrition from the point of view of attitudes, Jiménez Jiménez' approach being located within a theoretical framework (Vygotskian Sociocultural Theory), while Dewaele chooses a corpus-based approach. The methodological perspective is also reflected in Altenberg & Vago's article on the advantages

and disadvantages of (and conclusions to be drawn from) grammaticality judgments. This reflection is important, as grammaticality judgments are still one of the most popular data elicitation methods.

The second section contains a number of *studies observing and describing the process of attrition* in a range of languages and settings. It is introduced by Yağmur's reflection and reassessment of his 1997 study on Turkish in Sydney, followed by Ben Rafael's large-scale study of 'Franbreu', the spoken French of Israeli Francophones, presenting a qualitative analysis of language contact phenomena (codeswitching, borrowing, interference) in different discourse situations among Francophones in Israel. The interest of this approach is that attrition is not seen as the only reason for modifications in language performance. Instead, it attempts to investigate the difference between 'contributions and enrichments' of Franbreu due to the language contact situation on the one hand and what should be considered attrition on the other. Especially interesting within this respect is the fact that the author takes her examples from different informants involved in different communication situations varying with respect to degree of formality. A rather different research design is chosen by Hutz, who presents a detailed investigation of a written corpus spanning six decades: a collection of letters written by a German speaker in emigration in the US, the findings of which suggest that even after such a long emigration span, attrition phenomena can be very minor indeed. The very opposite case is documented in the last study in this section: Ventureyra & Pallier present an investigation of the 'lost language' of Korean adoptees in France from a neurolinguistic perspective, suggesting far more radical patterns of attrition than documented by any other study so far.

The last section represents studies which interpret their data within the range of a *clearly defined theoretical framework*, with a view to finding evidence substantiating the model. First of all, there is a cluster of papers reporting on studies carried out from the point of view of Universal Grammar, with very suggestive findings. Gürel's data on the L1 attrition of Turkish in an L2 English context suggest that, as had been speculated (see above), similarity of languages is a "necessary condition for transfer" (Altenberg 1991:203); i.e. that L1 forms that have no analogue in L2 are more easily preserved than those which do have an L2 equivalent. McCormack looks at a linguistic feature that is very similar to that analysed by Gürel – constraints on reflexive binding – but investigates this in the context of the L2 attrition of English in a Japanese context, concluding that the attriting L2 system is still sanctioned by UG. Based on a very similar approach, Montrul completes these findings with data from a study comparing L2 learning and L1 attrition in the case of Spanish heritage speakers in the USA who are furthermore confronted with the problem of incomplete learning.

Two further papers in this section report on studies carried out within Myers Scotton & Jake's Abstract Level and 4-M models. Gross investigates the attrition of L1 German in late bilinguals, while Schmitt gives an account of the attrition of L1 Russian in children (both studies are carried out in an L2 English environment). These papers suggest that attrition might not be a process the effect of which is apparent across the entire morphological system, but that it is selective, affecting some levels of abstract lexical structure before others. The conclusions drawn from these studies can only be tentative, but the theoretical framework presented here does look promising.

This selection of recent research and reflections on L1 attrition thus constitutes a broad overview of the current state of the art and shows that attrition research is indeed entering a new phase. While the definition of attrition is becoming more concrete and viable, aspects from various other disciplines are permitting a broader view of the subject in all of its fascinating facets. At this point, there is one thing that we can predict with absolute certainty for the future of the discipline: the coming ten years will be exciting.

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- ¹¹ A large amount of the information on the background history of language attrition research presented in this section comes from personal conversations and emails exchanged with researchers who played 'key roles' in the first decade or so of the research. We are very grateful to Kees de Bot, Sjaak Kroon, Richard D. Lambert, Robert Vago, Theo van Els, and Bert Weltens for sharing their recollections.
- ² This remark was made in a keynote address at the 3rd *International Conference on maintenance and loss of minority languages*, Veldhoven, The Netherlands, Nov. 1998.
- ³ These observations are based on an analysis of some 160 publications on attrition, i.e. on non-pathological, intragenerational language loss (see also the annotated bibliography, this volume). Where more than one publication exists about the same study, only the most extensive one was counted (except in the case of pilot studies with a clear difference in the data), leaving a body of some 100 publications. We tried to be very thorough in our investigation, but in this type of overview, the possibility of overlooking some studies can, of course, never be totally excluded, so the figures presented here are to be considered approximations, not the gospel truth.
- ⁴ This problem is aggravated by the fact that Tilburg University Press, which published many PhD studies and other works on language attrition – such as El Aissati 1997, Klatter-Folmer & Kroon (eds) 1997; Yağmur 1997 – went out of business, making it nearly impossible to obtain copies of these important studies and collections.
- ⁵ At least within the field of attrition research.
- ⁶ In Ammerlaan's study, age of departure varied from 6 to 29 years, and Pelc's subjects were between 8 and 32 years old when they left Greece, with 50 % of the subjects having been between 12 and 17 years of age. Note however that Köpke (1999) found no age effect among her subjects, all of whom were beyond puberty when they emigrated (14-36 years, mean = 24.25 years), and neither did Schmid (2002) between her younger (11-16 years, mean 13.17) and her older (17-29 years, mean 22.53) group of emigrants.
- ⁷ Note that there was a correlation between level of education and length of stay in Yağmur's attriting groups, which may have distorted findings here (Yağmur 1997: 89).
- ⁸ Note that in this study, it could not be prevented that the control group had a lower education level than the experimental groups. This might well be the case for other attrition studies too, since 'unilinguals' frequently have a lower education level than bilinguals or polyglots.
- ⁹ This approach is convincing, since most of her subjects were children or teenagers at the moment of immigration and completed schooling in L2
- ¹⁰ Note that Jakobson modified his initial (1940) position later on (see Nespoulous, 1997, for more details).
- ¹¹ Unless embedded in a larger explanatory framework, as in the case of Seliger's 'Redundancy Reduction Principle' (see below).
- ¹² It is not clear from this research whether the coexistence of the two types of processes is specific to attrition in children or if it can be observed to the same extent in adults.
- ¹³ "The languages spoken by the bilingual may be said, metaphorically, to coexist in a state of competition for a finite amount of memory and processing space in the mind of the speaker." (Seliger & Vago, 1991: 4)
- ¹⁴ Note, however, that this finding has not been confirmed by another hypnosis study with a similar case (As, 1963), nor by other studies conducted with adopted children (Pallier et al. 2003; Ventureyra & Pallier, this volume).
- ¹⁵ For a discussion of psychological theories of forgetting and their implications for attrition, see Ammerlaan (1996: 10-19).
- ¹⁶ Note that word finding difficulties are also the most common disorder in all types of aphasia, in healthy aging (see Goral, in press), as well as one of the most frequent performance problems observed in young healthy unilinguals (particularly in case of fatigue, stress, etc.), suggesting that lexical retrieval is one of the most vulnerable aspects of language processing.
- ¹⁷ Note that there are no attrition studies of early bilinguals for whom the onset of attrition is situated in adulthood after having passed through a period of balanced bilingualism. If such a case exists, it should be added to the puzzle!
- ¹⁸ For a discussion of explicit vs. implicit memory for bilingualism and L2 learning, see Paradis (1994, 1997).
- ¹⁹ We consider the self-report scale used by Ammerlaan (1996), which only allows for the answers 'yes' and 'no' to questions such as "Can you speak Dutch?" or "Can you write in Dutch?" to be too unspecific to yield interpretable results, and will not discuss it here.

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