Chapter 7

Spelling and Pronunciation in Migrant Children: The Case of Italian-Swiss German Bilinguals

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Introduction

This paper is concerned with the interaction between different types of linguistic knowledge in the mind of a bilingual. On the one hand it addresses the well-known issue of interference from one language to another, while on the other hand it explores the relationship between speech and writing. The general claim is that phonetics and phonology may contribute to a better understanding of the cognitive processes underlying the acquisition of a second language writing system.

The empirical research presented here deals with the language production of Italian children who live in German-speaking Switzerland. In particular, the analysis focuses on how these subjects realise, both in spelling and in pronunciation, two relevant features of Italian:

(1) the contrast between voiced and unvoiced obstruents; and
(2) the opposition between singleton and geminate consonants.

It will be demonstrated that the major difficulties encountered with these phenomena are due to the different phonological functions which the phonetic properties of voicedness and segmental duration display in the varieties of the bilinguals' repertoire.

The remainder of this chapter is organised as follows. The introduction raises some general questions about the notions of 'second language' and 'bilingualism' in connection with the acquisition of writing systems. Then follows a brief characterisation of the linguistic biography and repertoire of Italian-Swiss German bilinguals, in order to allow a better understanding of the linguistic processes which can intervene in their spelling of Italian. The next section provides a contrastive phonological analysis of four language varieties (i.e. Standard and Regional Italian on the one

hand, and Standard and Swiss German on the other), focusing on the already mentioned features [±voice] and [±tense] as well as on the singleton/geminate contrast. Then follows a report on the results of classroom research, in which Italian-Swiss German bilinguals were tested in dictation and reading tasks. The final part answers the basic research question of this study, interpreting the findings in the light of a more general model of bilingual phonology.[1]

In the linguistics literature, there is a certain overlap between the notions of 'second language acquisition' (henceforth SLA) and 'bilingualism'. In a common-sense view, SLA can be regarded as the process through which monolingual adults acquire a new language, whereas bilinguals grow up, from their early childhood, using at least two different languages. Yet, as is well-known, there are many definitions of 'bilingualism', according to such differing criteria as the level of competence or the amount of language use (Romaine, 1995: 11–19); in fact, from a broader perspective, some scholars conceive of SLA as just a particular form of bilingualism.

The intersection of SLA and bilingualism becomes even clearer if one takes into account two additional criteria, namely the relative acquisitional chronology in the bilingual's biography and the specific medium of verbal communication (i.e. the distinction between spoken and written language). As far as speech is concerned, some people acquire language A as their mother tongue and then learn language B as a second language at school, but the spoken second language may turn out to be the first language through which literacy is achieved. This happens in quite a few diglossic situations, typically in linguistic minorities and in migrant communities. For instance, the children of the 6–8 million or so Moroccans who speak a Berber language normally learn to write Arabic as a first language at school, and the same situation holds for the 12 million or so Kurds who are predominantly literate in the Turkish language. As regards migrants, we must often rely on estimates, but it is reasonable to assume that the majority of the 40 million Hispanics in the USA have acquired literacy in English, not in Spanish; at least, this is supposed to apply to those born in North America. Now, if language A cannot build on an orthographic norm and a literacy tradition, language B often remains the sole code available for the purpose of written communication. In other circumstances, bilinguals may learn to write language A only after language B, so that – from a chronological point of view – the spoken first language A becomes a second language in writing.

We may suppose that neither of these scenarios, i.e. the complete lack of literacy or the acquisition of limited writing skills in the mother tongue, is unusual in the European context, given the existence of large immigrant communities in several countries. Up to now, researchers have mainly

dealt with topics such as bilingual speech or spoken language attrition (Extra & Verhoeven, 1993, 1999); little attention has yet been paid to the bilinguals' knowledge of their writing systems.

When considering the different types of writing system used by bilinguals, one finds a broad variety of contact situations. Taking a European perspective, we may imagine the paths indicated in Table 7.1 towards the acquisition of a second language writing system.

The examples of languages and/or writing systems in the second and fourth columns are purely hypothetical and not linked to any real sociolinguistic context. Logically speaking, more contact patterns are possible, if one also takes into account the chronology or 'direction' of learning (for example, if the learner passes from a logographic script to a phonographic one, or vice versa). It is reasonable to assume that the 'distance', or the number of differences between the two writing systems, determines the degree of difficulty and the possibilities of interference in the acquisition process. The difficulties are probably greatest when one writing system is phonologically based and the other is not: consider the case of Chinese children living in the UK who start to memorise characters while already being familiar with the Roman alphabet. The second case, i.e. the mastering of a non-alphabetic but still phonographic writing system (e.g. a syllabary like *katakana*) is supposed to require less cognitive effort for a person literate in a western European language; still, this scenario is not supposed to be very frequent.

Instead, the third contact pattern – when two different alphabets are used by bilinguals – does occur among migrants. Such a situation has been investigated in Berkemeier's (1996) research on the children of German mothers living in Thessaloniki; these subjects were already familiar with Greek orthography and Cyrillic characters when they learnt to

Table 7.1 Types of contact between writing systems

First writing system	*Example*	*Second writing system*	*Example*
Phonographic	Roman (German)	Logographic	Chinese
Phonographic: alphabetical	Cyrillic (Russian)	Phonographic: syllabic	Hang'ul (Korean)
Alphabet 1: Greek	Greek	Alphabet 2: Roman	French
Alphabet 1: Roman	Spanish	Alphabet 2: Roman	Swedish

write German using the Roman alphabet. The same language pair appears in Hampel's (2000) study of the attrition of German orthography among Greek children who first went to school in Munich and then re-migrated to their home country. Both researchers reported several types of interference from the Cyrillic alphabet on the children's spelling of German.

The present study addresses the fourth pattern of contact, where both languages are written in the Roman alphabet. More precisely, it will deal with the spelling of the mother tongue by Italian children who live in German-speaking Switzerland. Little research seems to have been done on scenarios of this sort, perhaps the most common in western Europe. Nevertheless, one can quote Luelsdorff's extensive work (1986, 1991) on the spelling of English by German adolescents who are regarded as 'bilingual spellers', even if English clearly constitutes a foreign language for them. Not surprisingly, this research revealed a strong influence of German orthography on the L2 writing of English.

Italian Migrant Children in Switzerland

Despite a popular belief, most of the 7.3 million inhabitants of Switzerland are not 'naturally' multilingual. Instead, the country is divided into three monolingual regions (German, French, Italian, including both standard and regional varieties); only the Rhaeto-Romance citizens are reasonably bilingual with German. From a quantitative point of view, speakers are distributed as follows: German (63.6%), French (19.2%), Italian (7.6%), Rhaeto-Romance (0.6%), other languages (9%).

In fact Italian is an immigrant language as well, since it is spoken by more than 200,000 people in the German-speaking part of the country, where more than half of them are born. These second-generation immigrants typically claim to have acquired Italian as their first language in early childhood. In some families, an Italian dialect is also spoken at home, but most frequently the children have only a passive competence in it, since their parents have brought them up with a (non-standard) regional variety of Italian. It is important to note that these varieties of Italian do not coincide with the Italo-Romance dialects (which are autonomous linguistic systems), even if they are heavily influenced by them, in particular as far as pronunciation is concerned (Lepschy & Lepschy, 1977); in this respect, the parental dialects do have an indirect influence on the regional accent of the children's Italian. On the local side of the linguistic repertoire, the first variety to be acquired is Swiss German, which is used for a wide range of communicative needs; therefore, the dialect of the host society is spoken rather early in interaction among peers, for example at kindergarten. Standard German is taught later as a formal language at primary school; however, it is the first language in which literacy is achieved. Not all Italian children are given the opportunity to receive a

formal education in their mother tongue: lessons in Italian – from two to four hours per week – are not obligatory; they start one year later and often take place in the pupils' spare time. As a consequence, their literacy is much more developed in German than in Italian.

To summarise, the children of Italian immigrants in German-speaking Switzerland are faced with a double diglossia, namely that of their ethnic group (which opposes the Italian language to an Italian dialect) and that of the country they are living in, which embraces both Swiss German and Standard German. The structure of this sociolinguistic repertoire can be characterised according to six parameters, shown in Figure 7.1, namely the order of acquisition and the level of competence for both spoken and written languages, as well as the dimensions of emotive preference and social prestige (De Rosa & Schmid, 2002a).

The 4-point-scales follow from the answers provided in a sociolinguistic questionnaire by the subjects of this study: a value of 1 corresponds to the variety which has been acquired first and is spoken most often, whereas a value of 4 indicates the latest acquired and less spoken variety (points 0 and 5 are simply artefacts of the diagram, since they do not form part of the questionnaire). For instance, on the basis of the first two parameters – order of acquisition and level of competence in spoken language – Italian and Swiss German can be regarded as the two central varieties of the repertoire (which are also most frequently employed in everyday life); in fact, code-switching between these two varieties is a widespread phenomenon in peer-group communication
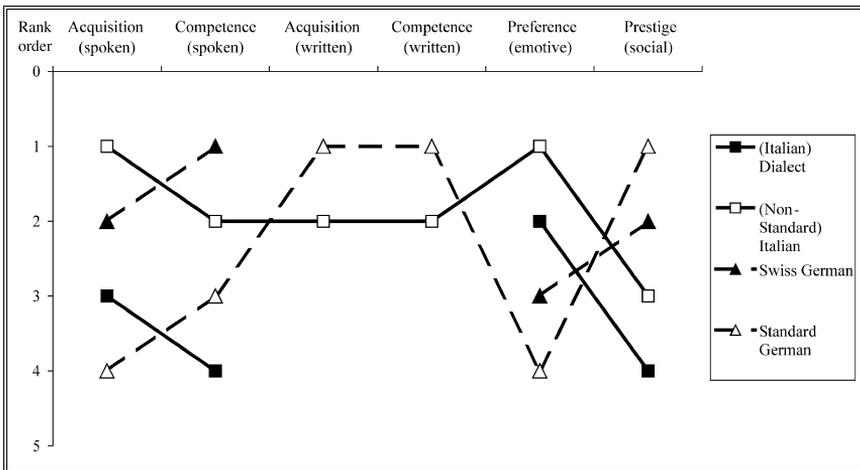
**Figure 7.1** The sociolinguistic repertoire of the Italian/Swiss German bilinguals

(Schmid, 1992, 1993). As regards speaking, we note a shift from the ethnic varieties acquired first – Italian and Italian dialect – towards the varieties of the host society (Swiss German and German), in which a better level of competence is achieved. In writing, however, Standard German prevails over Italian both in acquisition order and in level of competence. A certain contrast between the ethnic and the local varieties follows again from the last two parameters, in that the Italian part of the repertoire is given a clear emotive preference over the German varieties, which, by contrast, are judged to have a greater social prestige.

Let us now illustrate some of the spelling problems faced by these subjects by commenting on typical errors found in their dictations (see below). Following a traditional error analysis approach (see, for example Lado, 1957: 3–109, chapter on 'How to compare two writing systems'), we discover three types of misspellings. First, there are problems due to certain structural properties of Italian orthography itself. Compared to French or English, the Italian language is commonly believed to be quite 'easy' to spell (and also to pronounce since its orthography adheres rather closely to the alphabetical ideal of a one-to-one-relationship between sounds and letters; etymological and morphological factors play only a marginal role (Lepschy & Lepschy, 1977)).

Nevertheless, the Italian spelling system contains a certain amount of allography, i.e. alternative correspondences for the same phoneme. For instance, the phoneme /k/ corresponds to three allographs <c>, <ch> and <q>, depending on the phonotactic context. The letter <c> is required before the front vowel /a/ and the back vowels /o/ and /u/, whereas <ch> is used before the front vowels /e/ and /i/ (compare the words <casa> 'house', <cosa> 'thing', <culla> 'cradle' with <che> 'what' and <chi> 'who', all pronounced with initial [k]). The allograph <q> occurs only before the approximant /w/ (for example in <questo> 'this'), which in turn is expressed by the same grapheme <u> as the vowel /u/.

In our data we find misspellings such as «cuelo» and «squdiero»[2] instead of <quello> and <scudiero> (Figure 7.2, lines 3 and 5), which testify to the difficulty of choosing between the allographs <c> and <q> before the letter <u>, as the child has not yet grasped the graphemic corollary of the phonological distinction between vowel and approximant. Misspellings of this kind are supposed to occur also in the writing of monolingual Italian children, in that they reflect an inherent problem of the orthographic norm, i.e. the lack of bi-uniqueness in grapheme–phoneme correspondences.

Bilingual children have to face a second difficulty as a result of their acquaintance with the writing systems of two languages. Any person who writes a second language with the Roman alphabet knows that spelling systems differ considerably in the way letters correspond to sounds. Not only may the other language present new phonemes, but the two
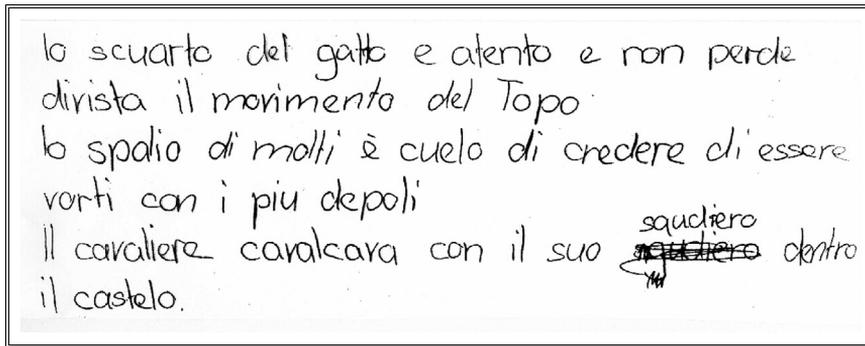
Figure 7.2 Italian dictation by a bilingual child living in German-speaking Switzerland

orthographies may use different graphemes for almost identical speech sounds; moreover, they often present different types of allography. For instance, Italian uses only one grapheme <f> for the sound /f/, against the two German allographs <f> and <v> (the voiced labiodental fricative /v/ is expressed by <w>: compare <Vater> 'father' with <Wasser> 'water'). In the bilingual child's dictation, the German <f v> allography underlies the misspelling «vorti» of the Italian word <forti> (Figure 7.2, line 4). Conversely, the phoneme /ʃ/ is expressed in German orthography with a trigraph <sch>, whereas Italian presents two allographs <sc> and <sci> according to the place of articulation of the following vowel (front versus back): again, in the bilinguals' dictations, we find the 'German' spelling of Italian words as in «restituische» instead of <restituisce>. Finally, a rare but clear type of interference appears with the use of upper-case letters for nouns, a German orthographic rule not shared by Italian (see the word «Topo» 'mouse' in line 2 of Figure 7.2).

However, in the bilinguals' dictations, we find a considerable number of misspellings that are of yet another kind. Note, for instance, the spellings of «squarto», «spalio» and «depoli» (lines 1, 3 and 4 of Figure 7.2) instead of <sguardo>, <sbaglio> and <deboli>; the fairly frequent substitution of the graphemes «p c» for <b g> points to a phonological problem related to the voicing contrast. Another error type involves the simplification of double consonants, as in «atento», «cuelo» and «castelo» instead of <attento>, <quello> and <castello> (lines 1, 3 and 6 of Figure 7.2). As we will see, however, the opposite kind of error also occurs, i.e. the replacement of <c> with «g» or the doubling of singleton consonants.

The present study focuses on this type of misspelling, trying to single out the various mechanisms which underlie the children's written language production. The basic research question concerns the relation-

ship between orthographic and phonological competence: to what extent are misspellings determined by phonological factors? The second research question is more general and addresses the overall structure of the bilinguals' linguistic knowledge. Our methodological concern is twofold: on the one hand, we want to point out the advantage of a phonological analysis that looks both at abstract features and at their phonetic implementation; on the other hand, it is fruitful to consider the whole sociolinguistic repertoire of the bilinguals, taking into account both standard and substandard varieties.

A Sketch of Contrastive Phonological Analysis

In order to fully understand the many ways in which consonants like /p/ and /b/ are realised in the bilinguals' repertoire, we need to compare four language varieties: Standard Italian, Standard German, Swiss German and regional Italian. Such a comparison must take into account not only phonemic contrasts, but also allophonic rules. Moreover, the abstract feature analysis has to be complemented by a closer examination of the phonetic realisation of these speech sounds. Together with the feature [±voice], it becomes necessary, here, also to consider the feature [±tense].

The phoneme inventory of Standard Italian heavily exploits the contrast between voiceless and voiced obstruents, as one can see from the following minimal pairs (see Schmid, 1999: 135–8); the examples in (1) oppose the six plosives /p/ ∼ /b/, /t/ ∼ /d/ and /k/ ∼ /g/, whereas those in (2) illustrate the distinctiveness of voicing in the labiodental fricatives /f/ ∼ /v/ and the palato-alveolar affricates /tʃ/ ∼ /dʒ/ (we do not consider here the contrasts between the alveolar fricatives and affricates /s/ ∼ /z/ and /ts/ ∼ /dz/, given their minor functional load).

(1) /'pasta/ 'pasta'   ∼   /'basta/ 'it is enough'
    /'mɔto/ 'movement'   ∼   /'mɔdo/ 'manner'
    /'kallo/ 'corn, horny skin' ∼   /'gallo/ 'cock'
(2) /'fɔʎʎo/ 'leaf'   ∼   /'vɔʎʎo/ 'I want'
    /'tʃiʎʎo/ 'lid'   ∼   /'dʒiʎʎo/ 'lily'

The opposition between the five pairs of phonemes – all identical with regard to place and manner of articulation – relies on the distinctive feature [±voice]. Moreover, this phonological contrast is implemented phonetically in a straightforward manner, by means of the absence versus presence of vocal-fold vibration during the closure/stricture phase of the obstruent; a periodic signal shows up in acoustic representations of these consonants, clearly visible as a 'voice bar' in the lower frequency range of a spectrogram (Albano Leoni & Maturi, 1995).

The situation in Standard German is somewhat more complex, in particular so far as the correspondence between the abstract phonological feature [±voice] and its phonetic realisation is concerned. According to current phonological analyses (e.g. Wiese, 1996: 10, 23), Standard German also opposes a series of voiceless obstruents to a series of voiced obstruents, as appears from the minimal pairs in (3) and (4):

(3) /pam/ 'pain'   ∼   /bam/ 'leg'
     /tɔʀf/ 'peat'   ∼   /dɔʀf/ 'village'
     /kʊs/ 'kiss'   ∼   /gʊs/ 'melting (of a metal) – founding'
(4) /ˈfaːʀən/ 'drive, ride' ∼   /ˈvaːʀən/ 'goods'

Nevertheless, the feature [±voice] gives rise to different surface forms, according to a variety of factors, depending both on the speaker (regional provenance, idiosyncratic behaviour) and on structural properties, such as the phonotactic position and the manner of articulation of the consonant (see Jessen (1998) for an extensive research review). It appears that the plosives /b d g/ are often pronounced without any participation of the vocal folds at all (thus as [b̥ d̥ g̊]), in particular at the beginning of an utterance, whereas the fricatives /z v/ are more likely to be voiced, especially in inter-vocalic and word-internal position. Word-initially, the contrast between /b/ and /p/ is guaranteed by means of an audible aspiration phase after the release of the unvoiced stop (as in English); thus, the word /pam/ is pronounced as [pʰam]. In syllable-final position, underlying voiced obstruents are devoiced by a phonological rule of neutralisation, the so-called *Auslautverhärtung* (Wiese, 1996). Thus, all in all, the frequency of fully voiced obstruents in Standard German is rather low.

As a consequence of this rather complex picture, some German phoneticians differentiate between the two series of obstruents in German on the basis of the feature [±tense] and its basic phonetic correlate, aspiration (see, e.g. Jessen, 2001; Kohler, 1984). Here, we will reserve this feature for the slightly different pattern of Swiss German. What counts for the purpose of our contrastive analysis is the fact that obstruents of Standard German can be pronounced with vocal-fold vibration during the closure or stricture phase, something which will never occur in Swiss German dialects.

At this point, a brief excursion into the history of phonological theory is in order. It is worth noticing that [±tense] already figures in the list of distinctive features established by Jakobson *et al.* (1952: 36), who claim that 'in consonants, tenseness is manifested primarily by the length of their sounding period, and in stops, in addition, by the greater strength of the explosion'. Twelve years later, the first two of the founding fathers of distinctive feature theory dedicate an essay on tenseness to Daniel Jones; in it, they state that 'a typical example of tense and lax stops and

fricatives, all of them produced without any participation of voice, is provided by the Swiss German consonantal pattern' (Jakobson & Halle, 1964: 100); in this view, 'tense' and 'lax' are synonymous with the terms *fortis* and *lenis* introduced by the Swiss dialectologist Josef Winteler (1876: 25).

Indeed, Swiss German lacks voiced obstruents altogether, instead establishing a phonemic opposition between tense and lax obstruents, which is exploited in numerous minimal pairs (in this case, from the dialect of Zürich):

(5) /ˈhuːpə/ 'horn' ∼ /ˈhuːb̥ə/ 'bonnet'
/ˈlɒtə/ 'lath' ∼ /ˈlɒd̥ə/ 'shop'
/kɛː/ 'given' ∼ /ǧɛː/ '(to) give'
(6) /ˈhɒsə/ '(to) hate' ∼ /ˈhɒz̥ə/ 'hare'
/ˈofə/ 'open' ∼ /ˈov̥ə/ 'oven'

As has been proved by acoustic measurements and perception experiments, this contrast is realised phonetically mainly through a contrast of duration between the two types of consonants; in disyllabic words, for example, the average duration of a post-vocalic tense consonant is 2.7 times as long as that of a lax consonant in the same position (Willi, 1996). Moreover, on the spectrograms of the lax plosives, no voice bar can be found (Willi, 1996).

Now, quite astonishingly, the same phonetic type of consonant also occurs in regional varieties of Italian, but with a different phonological status. In fact, some varieties of southern Italian differ from the standard language, in that they have two additional allophonic rules converting tense voiceless sounds into lax ones (Lepschy & Lepschy, 1977: 71–2; Schmid, 1999: 151–2; De Rosa & Schmid, 2000: 53–96).

$$(7) \quad \begin{bmatrix} -\text{sonorant} \\ -\text{voice} \\ +\text{tense} \end{bmatrix} \longrightarrow [-\text{tense}]/V$$

$$(8) \quad \begin{bmatrix} -\text{sonorant} \\ -\text{voice} \\ +\text{tense} \end{bmatrix} \longrightarrow [-\text{tense}] \Big/ \begin{bmatrix} -\text{consonantal} \\ +\text{nasal} \end{bmatrix}$$

Rule (7) applies to a wide range of central and southern varieties of Italian. It states that an unvoiced obstruent is realised as lax (i.e. [−tense]) when it occurs after a vowel: for instance, Standard Italian <poco dopo> 'a moment later' is pronounced as [ˈpɔːǧo ˈdɔːb̥o]. According to rule (8) – which applies only to the south of Italy, not to the centre – an unvoiced obstruent is realised as lax when it occurs after a nasal: for instance, Standard Italian <tanto tempo> 'much time' may be realised as [ˈtand̥ə ˈd̥əmb̥ə]. This rule is variable to some extent, in the sense that sometimes the lax allophone may also be at least partially voiced. Neither process applies only word-initially, but they also apply across

word boundaries; rule (7) is blocked only by another well-known *sandhi* process of Italian, the so-called *raddoppiamento fonosintattico* (phonosyntactic doubling) (Lepschy & Lepschy, 1977: 65–7).

The last type of misspelling we saw in Figure 7.2 has to do with double consonants. Also with regard to geminates, we find three different structural solutions in the repertoire of our bilinguals.

As is well-known, Italian has fully phonological geminates, which show up in numerous quasi-minimal pairs (Lepschy & Lepschy, 1977: 63; Schmid, 1999: 168–9).

(9)   /'nɔte/ 'notes'   ~   /'nɔtte/ 'night'
       /'kasa/ 'house'   ~   /'kassa/ 'cashbox'
(10)   /'kade/ 'he/she falls'   ~   /'kadde/ 'he/she fell'
       /'beve/ 'he/she drinks' ~   /'bevve/ 'he/she drank'

This holds true for fifteen out of twenty-one consonants in Standard Italian, the exceptions being /z/, which exists only as a singleton consonant, and /ʃ ɲ ʎ ts tz/, which occur inter-vocalically only as geminates. Note, in particular, that geminates are not restricted to unvoiced obstruents, but frequently occur with voiced obstruents, as shown by the minimal pairs in (10). The regional varieties of central and southern Italy basically maintain the same pattern, with some minor differences; for instance, two additional consonants are 'intrinsically' long, namely /b/ and /dʒ/ (Lepschy & Lepschy, 1977: 70; Schmid, 1999: 169). Phonetically, the gemination contrast relies almost entirely on the time domain of the closure/stricture phase, the durations of geminates being close to twice those of singletons (Giovanardi & Di Benedetto, 1998; Esposito & Di Benedetto, 1999).

In Standard German, by contrast, the graphemic double consonants only serve as a means of signalling phonologically short vowels, as we see from the minimal pairs in (10):

(10)   <Ratte> /'ʀatə/ 'rat'   ~   <rate> /'ʀaːtə/ '(I) advise'
       <schaffe> /'ʃafə/ '(I) create' ~   <Schafe> /'ʃaːfə/ 'sheep (pl.)'
       <Kamm> /kam/ 'comb'   ~   <kam> /kaːm/ '(he/she) came'

Note that the double consonants of Standard German are always pronounced as short (DUDEN, 2000: 69–106).

As to the Swiss German dialects, the existence of geminates or the phonological status of consonantal length is a matter of theoretical debate, since there are at least four ways to analyse the traditional fortis/lenis contrast. One possibility is to maintain that the long obstruents of Swiss German are real geminates, which are one of the possible manifestations of the feature specification [+tense] (Kohler, 1984; Jessen, 2001). A second view dispenses with the feature [±tense], instead interpreting the durational differences between the two types of obstruents as a binary contrast between geminates and singletons, as claimed in Kraehenmann's (2001)

study on the Turgovian dialect. A third proposal is based on a three-way opposition between lax, tense and geminate tense consonants; according to Ham (2001: 52), this pattern characterises the Bernese dialect. It lies beyond the scope of this study to evaluate these different proposals, also given that there are indeed considerable differences among Swiss German dialects as far as consonant length is concerned (Dieth & Brunner, 1943). Instead, a fourth alternative is adopted, in line with a more traditional understanding of the dialect spoken by our subjects; this solution dispenses with geminates, simply assuming a binary contrast between tense and lax obstruents (Willi, 1996: 19).

The interpretation of durational differences between speech sounds of the same category not only constitutes an analytical difficulty for the linguist but it also probably raises a serious problem for a bilingual who has to cope with such considerable structural diversity in four phonological systems. As we have seen, the duration of closure/stricture not only provides the relevant acoustic cue for the distinction between geminates and singletons in Italian, but it also constitutes – in our view – the main phonetic correlate of the feature [±tense]. There is, however, more to it than that: to a minor extent, a difference in duration even characterises the contrast between unvoiced and voiced obstruents. According to a phonetic universal based on physiological constraints, we can predict that, other things being equal, a voiced stop is shorter than a voiceless one (Maddieson, 1997: 624–7). In a sense, tenseness normally goes with voicelessnes, whereas laxness accompanies voicing. In Standard Italian and, by and large, also in Standard German, a negative correlation exists between the distinctive feature [±voice] and the redundant feature [±tense]. Swiss German, on the other hand, has abandoned the [±voice] contrast by converting [±tense] into a distinctive feature.

Therefore it is possible that, in the bilinguals' language production, gemination interferes with the realisation of the features [±voice] and [±tense]. But even if we leave aside the geminate versus singleton contrast, the varieties of the repertoire still vary enough to create misperceptions or reinterpretations. Table 7.2 gives an overview of the contrastive

Table 7.2 The features [±voice] and [±tense] in the bilinguals' repertoire

	Standard Italian	*Regional Italian*	*Standard German*	*Swiss German*
−voice, +tense	/p/ [p]	/p/ [p]	/p/ [p pʰ]	/p/ [p]
−voice, −tense		[b̥]	[b̥]	/b̥/[b̥]
+voice, −tense	/b/ [b]	/b/ [b]	/b/ [b]	

analysis, demonstrating how the combinations of two features [$\pm$voice] and [$\pm$tense] result in three types of speech sound, which in turn are exploited differently in the four phonological systems. In particular, the intermediate category [−voice, −tense] serves as an allophone for opposite poles, belonging to the upper part in the Italian diasystem and to the lower part in the German diasystem.

In order to verify how the structural discrepancies between these phonological/graphematic systems are handled by bilinguals, classroom research was carried out, to be presented below.

Testing the Bilinguals' Spelling and Pronunciation: Two Classroom Experiments

Data were collected from 24 Italian children, living in a village on the lake of Zürich and aged from 12 to 15 years. This means that they have had extensive instruction in written German for 6−8 years, whereas the exposure to written Italian has been limited to a shorter span of time with regard both to the number of years and the amount of lessons per week (see above). As regards the regional origin of the families, it is important to note that the overwhelming majority of the parents come from southern Italy, in particular from Calabria (De Rosa & Schmid, 2002a: 216).

In order to analyse the children's realisations of Italian obstruents, we ran two experiments to elicit both written and oral data during the Italian language course. Twenty sentences were first read in a dictation exercise by the teacher (a native speaker from northern Italy) and written down by the pupils; subsequently, the children were recorded in a separate room while reading the same 20 sentences aloud. This material, which is reported in De Rosa and Schmid (2002a: 239−40), contains different kinds of obstruents occurring in 190 contexts, so that the subjects produced voiced and unvoiced obstruents, both as single consonants and as geminates. The obstruents occur in eight different phonotactic contexts, namely word-initially before vowels (#CV), word-initially after sibilants (#SC), between vowels both as single consonants (VCV) and as geminates (VCCV), before and after liquids (CL, LC), and finally after nasals (NC). All in all, this procedure yielded a corpus of 9120 tokens, i.e. 4560 written words and 4560 spoken words (the quantitative distribution of the contexts is illustrated in De Rosa and Schmid, 2000: 53–96). The evaluation procedure of the data consisted of an error analysis of the dictations and an auditory analysis of the pupils' tape recordings.

In the following discussion, the findings will be presented first from a qualitative and then from a quantitative point of view.

A first type of restructuring in the bilingual phonological and graphematic system of Italian shows up when the lax allophones – [b̥ d̥ g̊] etc. – of the regional varieties are related to the voiced obstruents of Standard

Table 7.3 Postvocalic lenition (or 'voicing') in Italian dictation and reading

Phoneme	Orthographic word	Bilinguals' spelling	Phonemic representation	Bilinguals' pronunciation	English translation
/p/	<rapinatore>	«rabinatore»	/rapina'tore/	[rabina'toːre]	'robber'
/t/	<protegge>	«prodege»	/pro'tɛdʒdʒe/	[proˈdet̥ʃe]	's/he protects'
/k/	<le pecore>	«le pegore»	/le 'pekore/	[le 'pɛɡ̊ore]	'the sheep'
/tʃ/	<giacimenti>	«giagimenti»	/dʒatʃi'menti/		'deposits'

Table 7.4 Hypercorrect postvocalic devoicing in Italian dictation and reading

Phoneme	Orthographic word	Bilinguals' spelling	Phonemic representation	Bilinguals' pronunciation	English translation
/b/	<la bicicletta>	«la picicletta»	/la bitʃi'kletta/	[la pitʃi'klɛtːa]	'the bicycle'
/d/	<giudicarlo>	«giuticarlo»	/dʒudi'karlo/	[dʒud̥i'karlo] [tʃuti'karlo]	'(to) judge it'
/ɡ/	<Gabriele>	«Cabriele»	*/ɡa'brjɛːle/	*[ɡ̊a'brjɛːle]	(first name)
/dʒ/	<giacimenti>	«ciacimenti» «cacimenti»	/dʒatʃi'menti/	[tʃatʃi'menti]	'deposits'

Italian /b d g/. Both in spelling and in reading, we do indeed find cases where a process of lenition applies to voiceless obstruents occurring after vowels.

In the dictations, the pupils represent /p t k tʃ/ with the graphemes «b d g gi», which correspond to the homorganic voiced phonemes. This is in accordance with their similar behaviour in the reading task, where the allophonic rule described in (7) leads to the lax, but voiceless, realisations [b̥ d̥ g̊].

As a reaction against this natural tendency, [b d g] may be considered as mere variants of their unvoiced counterparts /p t k/; this leads to an inverse application of the allophonic rule (7).

The phonosyntactic context of <giudicarlo> is intervocalic (<non puoi giudicarlo> 'you can't judge it'), whereas the first name <Gabriele> occurs at the beginning of the sentence. The two different pronunciations of <giudicarlo> indicate that we must distinguish two different outputs of the devoicing process, depending on whether the resulting consonant is fully devoiced and tense (a clear case of hypercorrection) or devoiced and lax (like a Swiss German lenis sound).

As is to be expected on the basis of rule (8), the bilinguals also show instances of lenition/voicing in the postnasal context (in the corpus, /p/ and /k/ do not occur in this position, so that the allophonic process could not apply).

In this context, too, we find the same contradictory behaviour as after vowels, since a hypercorrect reflex produces the devoicing of voiced consonants.

The grapheme «c» in «incusto» represents the phoneme /tʃ/; similar misspellings are rather frequent, owing to the lack of bi-uniqueness between the phonemes /tʃ/ and /dʒ/ and the corresponding graphemes <c>, <ci> and <g>, <gi> (see Introduction).

As regards plosives after word-initial sibilants, we only observe devoicing (Table 7.7).

This result points to interference from Swiss German phonotactics, where lax sibilants are not allowed to occur in such a context; therefore, the feature [−tense] of the alveolar sibilant spreads towards the following consonant.

Similarly, a Swiss German pattern may intervene in the substitution of the voiced double consonants of Italian with tense singleton consonants, given that both Italian geminates and the Swiss German [±tense] contrast rely on a durational difference.

For instance, the realisations of <giubbotto> indeed show a double degemination of /b/ and /t/, both in spelling and in pronunciation. Additionally, in <pioggia> and <protegge> the voiced geminate /dʒ/ undergoes not only degemination, but also 'devoicing'.

Conversely, we also find the opposite process, i.e. the hypercorrect gemination of singleton consonants.

Table 7.5 Postnasal voicing in Italian dictation and reading

Phoneme	Orthographic word	Bilinguals' spelling	Phonemic representation	Bilinguals' pronunciation	English translation
/t/	\<attento\>	«attendo»	/at'tɛnto/	[a't:ɛndo]	'attentive'
/tʃ/	\<cancellino\>	«cangelino» «cangellino» «cangielino»	/kantʃel'lino/	[kandʒe'li:no]	'blackboard eraser'

Table 7.6 Hypercorrect postnasal devoicing in Italian dictation and reading

Phoneme	Orthographic word	Bilinguals' spelling	Phonemic representation	Bilinguals' pronunciation	English translation
/d/	\<prende\>	«prente»	/'prɛnde/	['prɛnte]	'he/she takes'
/dʒ/	\<ingiusto\>	«incusto»	/in'dʒusto/	[in'tʃusto]	'unfair'

Table 7.7 Postsibilant devoicing in Italian dictation and reading

Phoneme	Orthographic word	Bilinguals' spelling	Phonemic representation	Bilinguals' pronunciation	English translation
/b/	\<sbaglio\>	«spaglio» «spalio»	/'zbaʎʎo/	['sbḁʎo]	'mistake'
	\<sbatte\>	«spate» «spatte»	/'zbatte/	['spaːte]	'he/she strikes'
/g/	\<sguardo\>	«scuardo» «scuarto»	/'zgwardo/	['skwardo]	'look' (n.)

Table 7.8 Degemination (and devoicing) in Italian dictation and reading

Phoneme	Orthographic word	Bilinguals' spelling	Phonemic representation	Bilinguals' pronunciation	English translation
/b/	\<giubbotto\>	«guboto» «cupotto»	/dʒubˈbɔtto/	[dʒuˈbɔːto] [tʃuˈbɔːto]	'jacket'
/t/	\<giubbotto\>	«guboto»	/dʒubˈbɔtto/	[dʒuˈbɔːto] [tʃuˈbɔːto]	'jacket'
	\<sbatte\>	«spate»	/ˈzbatte/	[ˈspaːte]	'he/she strikes'
/k/	\<soccorso\>	«socorso»	/sokˈkorso/	[sɔˈkɔrso]	'help'
	\<sacco\>	«sacho»	/ˈsakko/	[ˈsako]	'bag'
/dz/	\<razzo\>	«razo»	/ˈradzdzo/	[ˈradzo]	'missile'
/tʃ/	\<ghiaccio\>	«giacio» «giaco»	/ˈgiatʃtʃo/		'ice'
/dʒ/	\<pioggia\>	«piocia»	/ˈpjɔdʒdʒa/	[ˈpjɔdʒa] [ˈpjɔtʃa]	'rain'

Table 7.9 Gemination of single consonants in Italian dictation and reading

Phoneme	Orthographic word	Bilinguals' spelling	Phonemic representation	Bilinguals' pronunciation	English translation
/p/	<rapina>	«rappina»	/ra'pina/		'robbery'
/b/	<deboli>	«debboli»	/'deboli/	['dɛbːoli]	'weak' (m. pl.)
/t/	<protegge>	«prottece»	/pro'tɛdʒdʒe/	[pro'tːɛdːʒe]	's/he protects'
/k/	<le pecore>	«le peccore»	/le'pɛkore/		'the sheep' (pl.)
/ts/	<spazio>	«spazzio»	/'spatstsjo/	['spatːsjo]	'space'
/tʃ/	<piace>	«piacce» «biacce»	/'pjatʃe/	['pjatːʃe]	's/he likes'

It is reasonable to assume that most of these examples are due to hyper-correction, with some exceptions. As regards <deboli>, we can attribute both the phonetic and the graphetic realisation of /b/ to the regional norms of southern Italy, where intervocalic /b/ is always long; in the case of <spazio>, too, the actual spelling is motivated by the real pronunciation of intervocalic /ts/ not only in southern varieties, but also in Standard Italian (see above).

Moving on to a quantitative evaluation of the data, we first have to emphasise the very low percentage of deviations, which modifies the rather dramatic impression given of the dictation in Figure 7.2: with regard to the entire corpus, there are only 5.13% of spelling errors in the dictation exercise, and 7.89% of deviant pronunciations in the reading task. If we now compare the different phonological processes in the dictation and in the reading task, the picture in Figure 7.3 arises.

Note that the two weakening processes of voicing and lenition are distinguished only in speech, where indeed we can observe three different types of sound, namely tense unvoiced, lax unvoiced and lax voiced (e.g. [t], [d̥] and [d]); conversely, the graphic code forces subjects to make a binary choice between <t> and <d>, no grapheme being available for the intermediate category. This is why Figure 7.3 contains no score for lenition.

Now the results of our analysis show that voicing and lenition together represent the most frequent processes in reading (171 tokens), but affect spelling to a lesser degree (only 38 tokens). The opposite process of
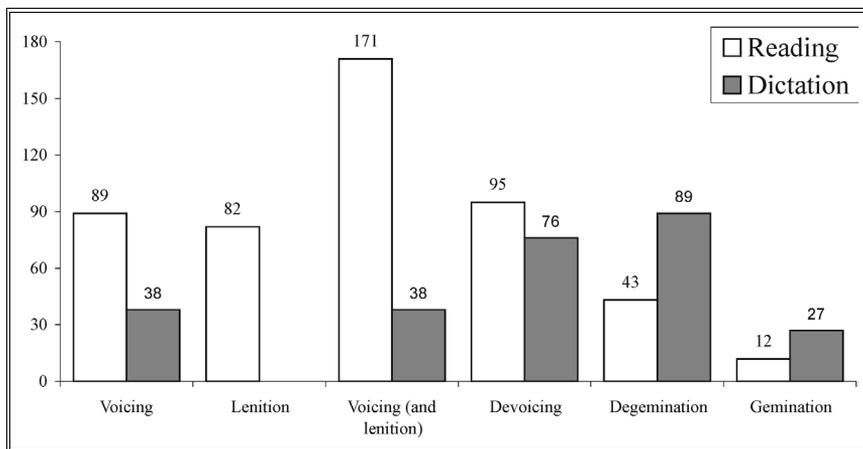

Figure 7.3 Total number of deviations revealing phonological processes in Italian dictation and reading

devoicing is present to more-or-less the same extent in dictations and in reading (76 and 95 tokens, respectively). Subjects appear to apply the allophonic rules (7) and (8) of southern Italian varieties in oral production, whereas they tend to avoid them in writing. The devoicing process results from two factors: namely, hypercorrection in the case of a fully tense devoiced consonant, or interference from Swiss German if the obstruent is realised as devoiced, but with a lax articulation.

The insecurity apparent with the voicing versus devoicing problem mainly affects pronunciation, whereas the contradictory behaviour related to gemination and degemination is more evident in the dictation task. However, the clear preference for degemination (89 tokens) might reflect a merely graphetic tendency to simplify double consonants and is not necessarily based on an underlying phonological representation. Similarly, the few cases of gemination (27 tokens) can be interpreted as a symptom of hypercorrection and orthographic insecurity; however, some graphetic double consonants do reflect underlying geminates, in particular as far as post-vocalic /b/ and intervocalic /ts/ are concerned.

Let us now consider the different phonotactic positions in which the consonants under analysis may occur. Figure 7.4 shows the percentages of deviations in relation to eight different contexts:

(1)   word-initially before a vowel (#CV) like <p> in <le pegore>;
(2)   after a word-initial sibilant (#SC) like <b> in <sbaglio>;
(3)   between two vowels (VCV) like <d> in <giudicarlo>;
(4)   as an intervocalic geminate (VCCV) like <tt> in <sbatte>;
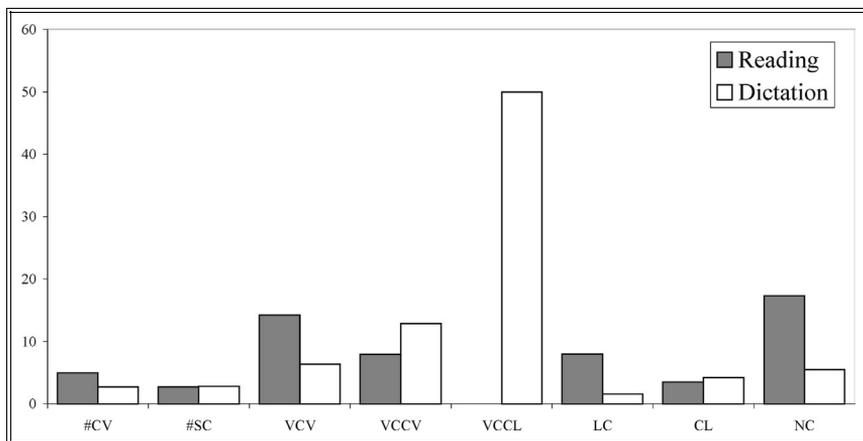
Figure 7.4 Deviations in Italian dictation and reading according to context (%)

(5)   as a geminate between vowel and liquid (VCCL) like <bb> in <pubblicità>;
(6)   after a liquid (LC) like <z> in <alza>;
(7)   before a liquid (CL) like <p> in <prende>;
(8)   after a nasal (NC) like <d> in <prende>.

Thus, a quantitative error analysis according to the phonotactic contexts largely confirms the foregoing analysis. In reading, deviations mainly occur with singletons after vowels and nasal consonants, whereas in the dictation task, geminates clearly constitute the critical point. As an example, consider the VCCL context, where half of our sample has simplified the double <bb> in the word <pubblicità> 'advertising'.

At this point, one might ask whether there is a quantitative relationship between deviations in reading and spelling errors in the individual subjects: do the ones with many errors in the dictation show the same kind of phenomena in their pronunciation?

The answer that emerges from Figure 7.5 is clearly negative. This figure shows a scattergram of subjects' scores for reading (on the x-axis) plotted against scores for dictation (on the y-axis); a clear correlation between the two would be indicated by a 'steep' regression line and a high coefficient of determination (R^2 close to 1). Instead, the graph clearly reveals the
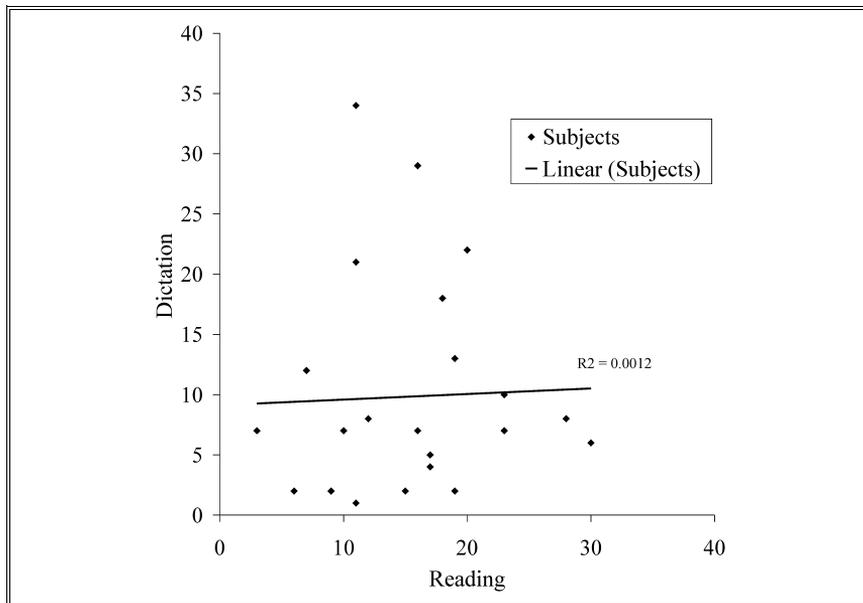
**Figure 7.5** Subjects' deviations in Italian dictation and reading

absence of any quantitative correlation between orthographic and phonetic competence, indicated by the very 'flat' linear regression and the very low coefficient of determination ($R^2 = 0.0012$). In fact, there are subjects with a rather standard-like pronunciation who make many spelling mistakes – for instance, with 11 deviations in the reading task and 34 in the dictation. But there are also subjects with high orthographic competence but clearly non-standard pronunciation, with six deviations in the dictation and 30 in the reading task (see De Rosa & Schmid (2002a: 222–38) for the profiles of the individual pupils). The absence of any quantitative correlation between orthographic and phonetic competence is indicated in the graph by the very flat linear regression line and the low coefficient of determination ($R^2 = 0.0012$).

Discussion

Do the spelling errors of Italian-Swiss German bilinguals have a phonological basis? Considering the results of the two classroom experiments, we can give a positive answer to the basic research question of this study. Obviously, the relationship between orthographic and phonological knowledge in bilinguals is not simple and deterministic, but there is evidence that at least some spelling errors are phonologically motivated. In particular, the voicing or devoicing of obstruents can be attributed to a difference in phonological structure between the four varieties of the bilinguals' repertoire, which mainly derives from the different distribution and status of the features [$\pm$voice] and [$\pm$tense]. Nevertheless, there is no direct quantitative correlation, whether we consider the corpus as a whole or we look at the spelling and reading of the individual subjects.

Moreover, the well-known phenomenon of hypercorrection has to be taken into account. In fact, there are two main strategies in dealing with the speech–spelling mismatch: either spellers keep as close as possible to the phonetic surface, or they try to inhibit the influence of the spoken (native) language on their writing. The same contradictory behaviour emerges in the way German spellers of English cope with their native rule of final obstruent devoicing: on the one hand, we find examples of 'phonetic realism', as appears from the devoiced final stop in «fint» instead of «find», but there are also attempts to realise graphetically a hypothetical underlying form, which lead to forms like «mead» instead of <meat> (Luelsdorff, 1991: 52). This second strategy testifies to the existence of a 'phonological awareness' in the acquisition of a second language writing system; from a developmental perspective, it reveals that some sort of learning is taking place at this stage.

It is true that some spelling errors, such as the simplification of geminates, could be motivated mainly by graphetic factors: writing one
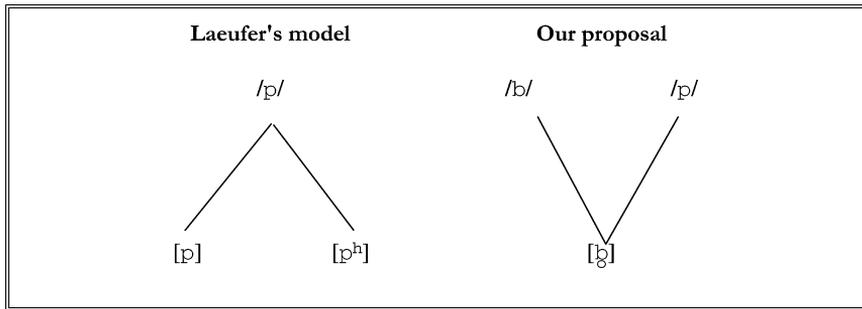
Figure 7.6 Two types of merging

consonant instead of two obeys a sort of graphetic 'law of least effort'. However, if degemination is accompanied by devoicing (e.g. /dʒdʒ/ > /tʃ/ in both the graphetic and the phonetic performance of Italian, it is likely to derive from contact with the phonological system of Swiss German, which dispenses with both voiced obstruents and geminates, instead using a longer closure duration as a cue for tenseness.

Taking as proven the strong phonetic and phonological bias in the spelling of our subjects, we may now turn to the second, more general research question: what are the driving forces in shaping the bilinguals' phonological representations of Italian? An initial finding to be stressed lies in the rather high standard of their spelling. Moreover, it appears that the main interference with the norms of Standard Italian does not come from the German part of the repertoire, but rather from the regional varieties of southern Italy. Above all, it is the latter model which leads to non-standard pronunciation and instances of hypercorrection.

Additional evidence for the strong influence of regional pronunciation norms comes from other allophonic processes appearing quite often in the speech of these children, like the intervocalic spirantisation of /tʃ/ or the affrication of /s/ after sonorants (De Rosa & Schmid, 2003: 175–6). In addition, many of the spelling errors found in our corpus have been detected in the writing of 'semi-literate' persons from central and southern Italy. Substitutions of, say, <t> with «d» (and vice versa) or of <tt> with «t» (and vice versa) are widely documented in letters of Italian prisoners of World War I and in autobiographies of foreign workers in Switzerland (see De Rosa & Schmid, 2000: 67–8 and references quoted therein).

To a lesser degree, however, interference from Swiss German does also occur. One typical pattern is the above-mentioned reinterpretation of voiced geminates as unvoiced singletons. A second example involves devoicing after word-initial sibilants, due to the transfer of a phonotactic constraint of Swiss German. A third case concerns the relatively frequent

devoicing of the type /dʒ/ → /tʃ/, given that the Swiss German phoneme inventory has no lax counterpart of the tense palato-alveolar affricate (Keller, 1961: 45, 51).

To conclude, it might be interesting to interpret our findings in the light of a more general consideration of the linguistic competence of bilinguals. The last decade has seen a growing interest in aspects of 'bilingual' phonology and phonetics, which has led both to a substantial body of empirical research and to the formulation of a number of theoretical models. In this field, the overlapping of bilingualism and SLA is particularly striking, as can be seen from the reviews of the literature in Laeufer (1997), Yavas (1998: 193–231), Obler and Gjerlow (1999: 123–8) and Guion (2003: 98–102); nevertheless, the useful bibliographies provided by Joaquim Llisterri try to separate the two phenomena (http://liceu.uab.es/%7Ejoaquim/).

It lies beyond the scope of this contribution to compare our findings with such a large variety of studies; instead, we will concentrate on one specific model proposed by Christiane Laeufer (1997). Drawing on Weinreich's (1953) ground-breaking ideas, this author proposes a typology of bilingual phonological systems, basically distinguishing between 'coexistent systems', 'super-subordinate systems', and 'merged systems'; a similar typology, called the 'integration continuum', has been proposed in Cook (2002).

According to Laeufer's model, the simultaneous acquisition of two languages in different social contexts leads to the development of 'coexistent systems', which function in rather independent ways. This would apply in the case of an 'ideal' bilingual who has learnt the two languages in separate environments since his or her early childhood and has achieved a native-like competence in both of them. By contrast, foreign language learning in a formal setting typically yields 'super-subordinate systems', where the perception and storage of an L2-phonology is strongly based on the representations of the first language, leading to the well-known phenomenon of 'foreign accent'. Finally, individuals who learn two first languages at the same time are supposed to develop a 'merged system', where one and the same phonological system is associated with different phonetic implementations for the two languages. This type of bilingual system may arise when two languages are acquired simultaneously in the same context. The research review done by Laeufer (1997: 331–40) proves that all three types of bilingual phonological system are substantiated by experimental studies on the VOTs (voice onset times) produced by bilinguals with different language pairs.

Comparing the results of the present study with Laeufer's typology, we can conclude that, on the whole, native-like production testifies to two coexistent phonological systems in Italian-Swiss German bilinguals; it is

precisely the strong influence of the regional varieties of Italian that underpins the similarity of their language production to that of mono-lingual speakers of Italian. Yet, as we have seen, there are some instances of interference from Swiss German phonological patterns, such as the replace-ment of voiced by voiceless lax obstruents, in particular after sibilants and in the case of palato-alveolar affricates. Finally, we also find forms which exhibit the partial merging of two phonological systems.

As an example of merging, consider the pronunciation [tʃud̥iˈg̊arlo] of the expression /dʒudiˈkarlo/ 'to judge it', which contains two voiceless lax stops, [d̥] and [g̊]. Now, the first lax plosive [d̥] results from the devoi-cing of the voiced phoneme /d/ and is probably due to interference from Swiss German. The same holds for the devoicing of the word-initial affri-cate /dʒ/ → /tʃ/, due to the above-mentioned structural gap in the Swiss German phoneme inventory. Conversely, the second lax plosive [g̊] is derived from the allophonic lenition of unvoiced /k/, as prescribed by rule (7) of the southern Italian varieties. Thus, one and the same type of obstruent is generated by two different structural forces, one 'interlin-gual' and the other 'intralingual'. Note that this sort of merging is differ-ent from that in Laeufer's model, which predicts two phonetic implementations of a unified underlying representation. In our case, we have quite the opposite, namely the derivation of one and the same type of surface realisation from two different phonological forms (see Figure 7.6).

It therefore seems reasonable to modify Laeufer's model slightly by stating that a typology of bilinguals' phonological systems must be con-ceived of as a continuum rather than a series of discrete categories with clear-cut boundaries. In the case of Italian-Swiss German bilinguals, we are mostly dealing with coexistent and separate systems. However, a certain amount of interference between the different systems must be allowed for. Merging does occur, but only marginally, in that the phono-logical representations of two different systems may produce the same kind of phonetic output.

Notes

1. This study would not have been possible without the fundamental contribution made by Raffaele De Rosa, who drew my attention to the phenomena discussed here and collected all the data. Subsequently, we together carried out the basic steps of the present analysis. In a sense, this paper represents a revised and extended version of De Rosa and Schmid (2002b); needless to say, I alone am responsible for any possible errors.
2. In representing the linguistic data, the following conventions are adopted: square brackets [] are used for phonetic realisations, i.e. the actual pronuncia-tion of a sound or a word; double angled brackets « » enclose the graphetic realisations produced by the informants, i.e. their real spelling.

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