Alphabetisation
in Spanish-German bilinguals

vorgelegt von
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von der Fakultät I – Geisteswissenschaften
der Technischen Universität Berlin
zur Erlangung des akademischen Grades
Doktor der Philosophie
- Dr. phil. -

genehmigte Dissertation

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Tag der wissenschaftlichen Aussprache: 09. Juni 2009

Berlin 2009

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1. Introduction

The PISA study carried out various reading comprehension tests to measure the performance level of pupils in countries all over the world. Particularly revealing are the results obtained in Canada with its bilingual school system based on immersion programs with bilingual teachers. In the PISA investigation Canadian pupils performed better than pupils of most other countries (PISA 2007, 225 ff). This example shows that literacy in bilinguals is already a substantial political matter: The Canadian government supported a bilingual school education with the positive result of increasing the number of additive bilinguals who seem to be more reflective, comprehensive and sensible in the use of their languages. Actual research on reading and writing in bilinguals is mainly concerned with advantages and disadvantages of bilinguals at certain acquisition stages and with the collection of evidence for where and how the languages of a bilingual can interrelate, when an individual operates on written material. Experimental studies, mainly based on reading data, have found solid evidence for differences in the way bilinguals and monolinguals acquire and process written language. A better understanding of these differences is relevant for decisions in the educational environment where questions are asked about how a bilingual should be alphabetised and taught in his/her written standard language(s). These differences have to be attributed to qualitative differences in monolingual and bilingual acquisition, which may be more psycholinguistic than linguistic in nature. How strategic differences show up, depends on the languages involved and the individual developmental history. This general hypothesis goes beyond the scope of many actual studies where bilingual and monolingual differences in reading and writing are exclusively interpreted in terms of language contact. Thus the aim of this study is to find evidence for underlying bilingual structures, bilingual processes and acquisition patterns, with crucial impact at basic and superior literacy stages, which not necessarily have to trigger language-contact phenomena.

"Alphabetisation in Spanish-German bilinguals" is a longitudinal study of Spanish-German children in Spain, whose development of standard written German is evaluated and compared at various acquisition points. This study focuses on features, mentioned in the psycholinguistic literature to be characteristic in bilingual acquisition. Impact of levelling and transfer, reliance on major rules and very early semantic-based processing is analysed with qualitative measurements, namely an individual bilinguality profile, an error analysis of mainly German exams and a comparison of developmental stages in bilinguals and monolinguals. A survey of up

to five years was necessary for each of our four participants, to discover, if and when certain developmental thresholds were reached and if and which long-term influences could be traced back to bilingual strategies. Surveys began after the first two years of schooling, because before grade 3 a majority of spelling errors are the result of the process of learning the alphabetical principle. This study is innovative insofar, as it opted for an observation age between eight and sixteen years. Most studies analyse reading and writing data, which are produced before alphabetisation and in its initial stages, or in adulthood. The emphasis of this study is on the phase between these stages, characterised by many important developmental steps from a literacy beginner to a skilled reader and writer, and realised as the building of a store of orthographic representations and links between them (rules and patterns).

In part 2. concepts and selected research results of the two vast linguistic areas, multilingualism and reading and writing, are summarised, such as individual aspects of multilingual proficiency. Then four aspects of the alphabetisation process of (Spanish-German) children are presented where impact of bilinguality features are expected. In 3. the general hypothesis is converted into concrete research questions, the observed population, material, and methodical procedures are presented. A qualitative error analysis and an individual bilinguality profile are used as qualitative measurements to decide whether observed errors are due to a bilingual strategy or rather to social, individual or affective factors, such as a tendency towards hypercorrection or simplification, as well as monitoring quality. Another principle task of the error analysis is to decide, if an error is explainable by problems, which are also present in monolingual alphabetisation, such as insecurities caused by pronunciation variants, or insecurities with unfamiliar vocabulary, or if bilingual acquisition leads to specific problems. The error analysis showed that often an error was triggered by more than one process. A bilingual acquires general (non-language specific) as well as language-specific processing and also interlingual processing. Four case studies build the biggest part of this study. Case one focuses on minor-rule delay, case 2 on levelling phenomena and their possible long-term impact, case 3 on transfer on the grammatical level and case 4 on reliance on joint structures and common major rules and transfer on the lexical and sentence-constructional level. Orthography development of three participants showed more or less impact of holistic processing strategies triggered by early semantic-based perception. This tendency is analysed in the conclusive part (8.) of this study where additional experimental evidence is provided for a holistic-processing tendency in writing in Spanish-German bilinguals, followed by an interpretation of the data according to developmental mechanisms of holistic processing. This part is preceded

by a summary of the bilinguality phenomena in Spanish-German bilinguals, detected in this study, and followed by a description of an intervention of levelling phenomena in our second participant and its efficiency.

To my knowledge this study is the first longitudinal study on the development of written-language skills in Spanish-German children/adolescents. Results of studies as the one, presented here, can have practical consequences for language education, its general guidelines, the specific progression and the learning context. A better understanding of underlying bilingual strategies and developmental tendencies allows a more realistic evaluation of learning success and expectations, i.e. a more adequate progress control. This study also shall show that simultaneous alphabetisation is not the parallel to monolingual alphabetisation in two languages. A discussion of possible improvements in bilingual education, with which this study closes, suggests that various preferable alternatives exist and that students have to be helped with their specific problems arising from bilinguality.

2. Key concepts and research

2.1. Individual bilinguality factors

The evaluation of communicative competence is a difficult and complex matter. It cannot be handled applying tests only. There is growing consensus that simulation of everyday communicative situations would be necessary to obtain a real impression of an individual's language capabilities. But the simulation of real communicative situations and circumstances leads to a dilemma: They are not authentic and the majority of us are not actor enough to act naturally in role play. Hence, a detailed linguistic individual observation is necessary when we deal with the notion of communicative competence (Baker 1996, 32). First and foremost this requires an observation during a period of time, supported by questionnaires for participants (or their parents, etc.), giving us a linguistic sketch of an individual's language-acquisition story.

2.1.1. Language background

To collect information about the language use in bilinguals, it has to be taken into account in which situations, with whom, how often and how much a person talks in the one and in the other language(s). Many important communicative settings are included in the language-background scales for bilingual school children by Baker (1996, 20 f). Baker's three self-rating scales ask for ...

(1) ... the language(s) used to communicate with certain people (parents, teachers, friends, etc.).
(2) ... the language(s) used by these people to communicate with the self-rating person.
(3) ... the languages used in certain activities (reading, shopping, on the telephone, etc.).

The scales, especially (3), were enhanced and modified for this study, and adapted to our population. On the following pages the resulting three scales are presented in the German version, which was the one used in this study.

Scales (1) and (2):

Hier sind einige Fragen zur Sprache, in der du mit bestimmten Personen sprichst und in der diese Personen mit dir reden. Bitte antworte so genau wie möglich, so wie es wirklich ist. Es gibt keine richtigen oder falschen Antworten. Die Fragen, die nicht auf dich zutreffen, sollst du auch nicht ankreuzen.

In welcher Sprache sprichst DU mit den folgenden Personen ? Wähle eine der Antworten aus.

	Immer auf spanisch	Auf spanisch öfter als auf deutsch	Gleichviel auf spanisch und deutsch	Auf deutsch öfter als auf spanisch	Immer auf deutsch
Vater					
Mutter					
Geschwister					
Au Pair oder andere Personen im Haushalt					
Freunde im Klassenraum					
Freunde auf dem Spielplatz					
Lehrer					
Nachbarn					
Großeltern					
andere Verwandte					
Freunde nicht aus der Schule					

In welcher Sprache reden die folgenden Personen MIT DIR ?

	Immer auf spanisch	Auf spanisch öfter als auf deutsch	Gleichviel auf spanisch und deutsch	Auf deutsch öfter als auf spanisch	Immer auf deutsch
Vater					
Mutter					
Geschwister					
Au Pair oder andere Personen im Haushalt					
Freunde im Klassenraum					
Freunde auf dem Spielplatz					
Lehrer					
Nachbarn					
Großeltern					
andere Verwandte					
Freunde nicht aus der Schule					

In scales (1) and (2) we added “au pair” or “other persons in the household“ as important communicative partners. Compare Fantini’s study where servants also play a role as communication partners for the child (Fantini 1985). From a certain socio-economic state upward families engage au pairs to make the access to the guest language and mentality easier for their children. For their stay in the guest country, the girls or boys live with the guest family and can be looked upon as a person to whom the child relates closely.

Scale (3):

Welche Sprache benutzt DU bei folgenden Beschäftigungen ?

	Immer auf spanisch	Auf spanisch öfter als auf deutsch	Gleichviel auf spanisch und deutsch	Auf deutsch öfter als auf spanisch	Immer auf deutsch
Denken					
Fernsehen / Video					
Telefonieren					
Bücher lesen					
Zeitschriften/ Zeitung lesen					
Comics lesen					
Mailen, chatten					
Einkaufen					
Sport, Verein					
CD’s					
Radio hören					
Religion					
Andere Freizeit-aktivitäten					

In scale (3), which deals with language use for certain activities, the feature "Earn money", which is not relevant for our population of school children, has been replaced by the activity "Thinking", which obviously is an important language-driven activity. According to Baker (1996, 7) thinking in one or the other language shows cognitive competence in this or these language(s)[1]. If a person thinks in both languages, further questions should be asked concerning task-specific thinking: In which language do you calculate, dream, think about your hobbies, think in the German lesson, pray, etc.

The original feature "Newspapers/Comics" has been changed. Periodicals were added, which from approximately ten years of age onwards become a more and more important medium to receive insider information about special fields of interest (cars, music, people, fashion, sports, to mention some). Internet reading is also included here. Comics, which pertain to a different language style, are excluded from the resulting feature "Newspapers/Periodicals". The frequent writing activitities "Mailing" and "Chatting", very different from school writing, were added as a new scale feature. Finally, the categories "Sport" and "Club", partly overlapping, were put together. The resulting categories of the activity scale were put in an order of probable activity frequency: Thinking, TV/Video, telephone, reading (with three subcategories), etc.

2.1.2. Interpretation of language-background scales

To know with whom which language is used (social and conversational context) provides already some insights into oral communicative competence, for example when a boy talks to his father in German and the father speaks to the boy in Spanish, we already know that they talk daily about father - son contents, where the boy's oral comprehension in Spanish is sufficient to follow the conversation. Language scales also give insights into the developmental factor, if in early childhood, exposure to a simplified but well-formed version of L 2 existed, for example parents/child discourse in early childhood, or child/child discourse, such as language-involving play (Hamers & Blanc 2000, 71 f). In the third case study a participant with little exposure to a child version of German is presented, whose language contact began at the age of three (see chapter 6. below).

When two languages are used with the same person, questions should be

[1] Nevertheless Baker does not include "Thinking" as a feature in his third language-background scale.

asked whether the languages are mixed or not and in which circumstances the one or the other language is preferred. Self-reported switching habits also should be considered, but as we will see, sometimes these reports differ from reality, for example, when mixing is unconscious. In the second case study a participant is presented, who tended to use all kinds of language, a strategy, which can violate norm restrictions in the written modalities (see 5. and 6.4.3. below). Indeed the use of various styles in both languages (academic, peer group, family, etc.), as in case studies 2 and 4 (see 5. and 7. below), suggests a tendency towards monolingual-like competence in both languages. It can also be assumed that more transitory overload is present in this constellation than in one where contact only in one style of the weaker language exists (as in case study 3, see 6. below).

For some dyads frequency (daily, once a week, etc.) and length of communication need to be taken into account to get a realistic quantitative impression of the child's language background. Quantitative extra information in scale (3) concerns reading activity and thinking. It makes a difference if five books were read or only one was read in a certain period. Information about reading activity is important to get insights into the competence level in the written standard of a language, as book reading supports vocabulary growth as well as the development of linguistic skills, such as text organisation and building more complex phrase structures. For a person, who sometimes thinks in the weaker language, it can be assumed that on these occasions (for example in the German lesson) there is no preformulation activity from the stronger language. Voluntary use of the weaker language(s) with persons where language choice exists (see 4.1.1. below), too, suggests that on these occasions there is no conscious transfer from the stronger language. Dreaming in the weaker language, again, suggests an unconscious access to it, triggered by emotion. Further facts that are worth knowing are: Which is the language the parents talk to each other ? Is there a distinction in language use with each of the grandparents ?

In sum the used scales provide information about topics and purposes of conversations and about speaking-, listening- and reading-competence. In addition, we can size up the amount of monolingual and bilingual mode and the frequency of code switchings and borrowings, when and how the languages are acquired, the number of years of use in both languages and the individuals' socio-economic situation. All these parameters are highlighted by Grosjean (1997) as important factors in the description of a person's state of bilinguality.

2.1.3. Multidimensional description of individual bilinguality with special regard to conceptual organisation

The distinction between compound and coordinate bilinguality concerns the possibilities of the cognitive organisation between semantic concepts and the lexicon in bilinguals. The issue is quite abstract and in the literature there are controversies on the use of the notions "compound" and "coordinate". In the following, the problems will be described briefly, as well as the way, the notions are understood in this study.

The start of L 2 acquisition and its mode have their impact on the cognitive organisation in bilinguals. According to Baker (1996, 15) we are dealing with compound bilinguality, if one language is acquired later and in a different context from the first language. When both languages are acquired from birth and in "fused" contexts, Baker speaks of coordinate bilinguality. Hamers & Blanc (2000, 27 f) put the labels the other way round and conclude that in the compound sub-type, conceptual units tend to be equivalent for both languages, while in the coordinate one, each language has its own conceptual units. The question arises, if in reality a strict distinction for the conceptual organisation in bilingual individuals exists, i.e. if they belong to the one type or to the other. Important for this study is the fact that interlingual word pairs can be considered as synonyms (Braun 1975, 232). If it is true that bilinguals tend to simplify their two systems by extending the meaning of two near synonyms so as to create exact translation equivalents, both subtypes should contain a large number of conceptual units, each signified by two synonyms, that is to say a lexical entry of L 1 and another one of L 2. The representational system of bilinguals can change over time as a function of experience in both languages (Hamers & Blanc 2000, 166 f). Weinreich (1953, 10) observes that the bilinguals' conceptual organisation is heterogenous rather than homogenous. He distinguishes three different kinds of cognitive structures between lexical entries and concepts in bilinguals (loc cit., 9 - 11):

- Two language-specific concepts for a similar group of referents, respectively with the same core meaning, exist. Each has its language-specific expression (type A). Mackey (1987, 710) adds that each corresponds to different chains of association and some of them are in complementary distribution to the others.

  Example:

  A child, growing up in a Canadian village, where French predominates,

possibly has two different concepts for the words *église* and *church*. While the former signifies a little village church, the latter is imagined as a massive, big building in town[2].

- One concept valid for both languages is signified by two expressions, one of language 1 the other of language 2 (type B).
  Example:
  A German - French kindergartener, performing in French, produces the analogy [ʃyzlə] from the German word *Schüssel* (*bowl*). In French, a plate, as well as a bowl and a course in a meal can be signified by the word *plat*, while in German one expression for each concept exists (*Teller*, *Schüssel*, *Gericht*). This example from Friedrich Braun (personal communication) illustrates that preschoolers prefer to organise their two vocabularies according to the pattern word L1 - concept - word L 2.

- A L1 concept is signified by a single expression, i.e. concept L 1 - word L 1. This expression, again, is connected with a translation into language 2 (type C).

Each bilingual may have an individual system of type-A, -B, and -C units. It is possible that type A is the target state for many concepts in bilinguals with high proficiency in both languages, while type C reflects an intermediate state of organisation, present in circumstances of acquiring a new language. Type B, again, may be the most productive pattern in simultaneous balanced bilinguals at early stages of language acquisition especially in cases of fused acquisition contexts. Furthermore, evidence was found that most concrete words are organised in a compound manner (i.e. in Weinreich's definition type B), words for culture-specific abstract notions, such as *taste*, *preference*, *or conviction*, rather in a coordinate manner (type A) (Hamers & Blanc 2000, 165).

Altogether, the distinction between compound and coordinate bilinguality is vague. It seems to be impossible to figure out the amount of type A-, B- and C-items for a concrete bilingual individual. Two additional tests are mentioned in Hamers & Blanc (2000, 164) to distinguish compound versus coordinate conceptual organisation in individuals: Semantic satiation of the translation equivalent[3] (when

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[2] Such intra-individual differences between translation equivalents were measured by Lambert and his associates with semantic evaluation scales (semantic differential technique) (Hamers & Blanc 2000, 164).

[3] The notion of semantic satiation accounts for the well known effect that the constant

type B), respectively difficulties in translating words (when type A).

"Coordinate" and "compound" do not characterise the bilingual, but they characterise certain structures in the bilingual lexicon, whose development is an empirical matter and must be decided as the case arises. The fact that monolingual children avoid synonyms at the same acquisition stage where bilinguals already use synonymity is one example of an earlier linguistic development in bilinguals. A direct consequence of an early dissociation of concepts and expressions is a preference for semantic-based processing.

Hamers & Blanc (2000, 27) present the following set of parameters, designed to give a sketch of one's individual bilinguality:

(1) Start of bilinguality (early - late, simultaneous - consecutive)
(2) Presence of a L 2 community (endogeneous - exogeneous)
(3) L 2 prestige (valorised, not valorised by L 1 society)
(4) Cultural membership (monocultural - bi-/multicultural)
(5) Language competence (balanced, dominant, semilingual)
(6) Conceptual organisation of the mental lexicon (compound - coordinate)

Like the discussed parameter (6), (4) also has to be rather understood as a scale than as a dichotomy. The contents of (2) and (4), again, are related. In this study, points (1) - (6) are used to give an introducing overview of each participant's individual bilinguality. Social aspects of the language constellation, features (2) and (3), were uniform for all participants (see 3.2. below). As individual language competence, feature (5), is the most important parameter for our purposes, it will be assessed by means of the language background and a detailed error analysis first and foremost in the written modalities (see 3.4. below).

2.2. Features of written standard language and their development

Written language, learned at school, requires the use of ...

- ... decontextualised language where "transmission of meaning depends on linguistic rather than situational information" (Hamers & Blanc 2000, 120)
- ... non-automatic language processes, which according to Cummins

repetition of a word leads to a short span of word-meaning loss. If the effect is extended to the translation, a stronger connection between both words in the lexicon is likely.

(1984, 139) are cognitively more demanding than automatic language processes.

- ... the high variety, which according to Ferguson (1959, 333) has a more complex grammar than the low variants[4]. The so-called "high language" is standardised, i.e. it has no (or little) variation in pronunciation, grammar and vocabulary (loc. cit., 331 f).

Various cognitive functions are involved when we deal with literacy. Fundamentally we need to perceive visually direction, shape and size of written material. This entails activation of certain occipital areas and attention functions in the right hemisphere. After visual perception the input has to be stored for a short time in the verbal working memory, which is bound up closely to the notion of attention. The corresponding cerebral areas are located in the frontal region of the brain. From here visual information undergoes its linguistic interpretation. This is done basically by parts of the language area in the temporal region of the left hemisphere, such as the Wernicke area. In a skilled reader linguistic content of written language - analogous to spoken language - is largely processed in parallel and subconsciously (automatically) by specialised cortical zones of the language centre. Towards the end of sentences, top-down strategies get more and more crucial during the reading process, because of the already existing semantic expectations. Acquisition of phonological representations normally precedes reading acquisition in the first language(s). Phonetic features and phonological representations of linguistic entities are located and processed in the left hemisphere, while suprasegmentals, such as intonation, stress, rhythm and speed of spoken language input, are processed in the right temporal region of the cortex (Owens 2003, 115). Graphemes and more complex visual sequences like onsets, rhymes, morphemes, words or others are more or less associated with phonological representations and processes. Mental orthographic representations of lexical entries have to be widely connected with the notion of the long term memory which is located in various parts of the brain.

Much research has been done on literacy skills. An important reason is the still increasing use of the written medium in our society, which gives rise to growing demands on our reading and writing competence. Literacy acquisition strongly depends on the quality of writing systems. Writing systems can be distinguished in terms of their relation to phonology. In a maximally shallow system each of the

[4] This is true for syntax, but not necessarily for morphonology. Spoken varieties have a richer system of reduction processes (see 2.4.2. and 6.4.2. below), which is not valorised in written language.

language's phonemes corresponds to exactly one minimal written unit (grapheme) and vice versa. The other extreme on this scale would be a writing system, in which there exists absolutely no relation to phonological or phonetic aspects of the language in question. Writing systems, which tend more to this second side of the scale, are called deep writing systems. Deep orthographies require a different processing mode than shallow ones (see 2.4.3. below). For both, phonological awareness is the most important faculty during the first alphabetisation stages where grapheme-phoneme correspondences (GPC) and the alphabetic principle of word recognition are learned (Wimmer 1993, 2). The resulting conversion process is automatised by practise. Independently from the depth of a writing system, complex written signs are memorised by the learner. Direct access to complex orthographic representations speeds up processing in the written modalities. Thus in full alphabetisation, where the learner operates with a growing inventory of complex graphotactical entities, such as words, a holistic processing method replaces the conversion method as the predominant access mode. Skilled readers still use the method of letter-by-letter processing as a control strategy to ensure accuracy of holistic processing (double checking, trial-parallel processing) and to read or write new words. Thus controlled attention to form is required in all stages of literacy acquisition and processing of written language.

Literacy is acquired through a conscious learning process in school accompanied by private reading once a threshold level of competence in reading has been acquired. Successful alphabetisation depends on preschool experience with the style of written standard language, and strongly on oral language competence, which is correlated with factors such as quality of exposure to language, length of residence and stage of language acquisition. Syntactic competence and vocabulary size are two parameters of language competence. They influence the quality of sentence parsing, which is important for text comprehension (Perfetti et al. 2001, 132 ff). Individuals, who have not reached grammatical and lexical thresholds have difficulties to integrate semantactic information in the reading (and writing) process.

In sum the following factors are important for successful reading and writing:

(1) Auditive and visual perception.
(2) Attention span and quality of the short-term memory for auditive and visual data.
(3) Vocabulary size, i.e. number of phonological and increasingly orthographic representations of lexical entries in the long-term memory.

(4) Phonological awareness (at least for syllabic and alphabethic scripts), as well as accuracy of phonological and orthographic representations.
(5) Morphological and lexical awareness.
(6) Retrieval strategies and correspondence between semantics, phonotaxis and graphotaxis.
(7) Grammatical and syntactical competence, as well as textual and narrative competence in the reading register.
(8) Subconscious and conscious self-monitoring (feedback loops).

A deficit in one or more of these factors can lead to problems in the written modalities.

2.3. Differences between monolingual and bilingual development

Only balanced bilinguals seem to establish a tendency towards an advantage in some cognitive faculties compared with monolinguals. Amongst others these cognitive faculties are divergent thinking, selective attention and metalinguistic skills. In the literature creativity, classification of objects, formation of concepts, memory, perceptive discrimination, problem solution, social sensibility, scientific concepts and comprehension of complex instructions are often found to be especially advanced in bilinguals. At the same time, simultaneous acquisition of two or more languages is characterised by temporary gaps in language-specific vocabulary and grammar compared with monolinguals (Hamers & Blanc 2000, 89). Typically they have acquired a larger total vocabulary than their monolingual peers but a smaller vocabulary in each of their languages. Some researchers infer that lexical representations in bilinguals are by and large organised in only one integrated store (Dijkstra & van Heuven 2002, 182), because vocabulary interferences can be observed and derived experimentally. In fact transfer between the two languages is used to make up for vocabulary gaps.

It is well known that acquisition of L2 phonology unfolds somehow differently the later it takes place and what is rather more important whether it takes place before, during or after literacy acquisition. We only have to think in terms of phonological awareness. Experiments indicate that sounds in L1 and L2 are related perceptually to one another and that bilinguals have an advantage in some phonological-awareness skills before alphabetisation starts, such as in rhyme

recognition (Bialystok 2001, 141 f). The question arises whether interlingual sound relations disturb or enhance literacy acquisition in related languages such as Spanish and German. If representations are differently organised and more important slightly different phonological mechanisms take place in bilinguals compared to monolinguals, literacy acquisition may already be based on different presuppositions. While some forms of interrelations and use of synonyms may favour a simplification tendency in bilinguals at an early acquisition stage, early developed phonological skills as well as an earlier understanding about separation between form and meaning, as described in 2.1.3., may ease the process of learning a new variety. Both tendencies may affect literacy acquisition, too.

Typically, in right-handers, there seems to be no difference of language laterality in monolingual and bilingual brains. Syntactical, lexical and phonological processing are located in the temporal area of the left hemisphere. Suprasegmental features are primarily processed by the right hemisphere. Nevertheless bilinguals, while using language, make more use of right hemispheric abilities. For example both ears are equally good speech detectors in bilinguals and in the perception process of verbal stimuli the right hemisphere is more involved than in monolinguals (Mägiste 1988).

In sum factors (1) - (8), presented in 2.2. above, differ between bilingual and monolingual children in the following way:

(1) Monolinguals have a right-ear advantage (REA) in auditive perception, bilinguals not, i.e. more right-hemispheric processing is involved in bilingual perception.
(2) -
(3) Bilingual children have more vocabulary than their monolingual peers, but less in each language.
(4) Some phonological-awareness skills are developed earlier in bilinguals. Indeed they use a basic inventory of sounds in more than one language, until language-specific features are acquired.
(5) Lexical awareness is developed earlier in bilinguals than in monolinguals. Bilinguals demonstrate a superior ability to separate word forms from the concepts they represent (Mackey 1987, 709).
(6) Bilingual children use a basic inventory of concepts in more than one language. Very early use of synonyms (see 2.1.3. above) suggests the presence of some awareness that linguistic forms are arbitrary. Although the resulting retrieval mode may differ between monolinguals and

bilinguals, bilingual adults are as fast as monolingual adults in word recognition (Grosjean 1997, 238 - 41), which is crucial for syntactic, semantic and pragmatic access.

(7) Until language-specific rules are acquired, bilinguals use a unified and simplified grammar, which is determined by "interlingual distance", i.e. the degrees of differences in both languages (Mackey 1987, 700).

(8) While both, monolinguals and bilinguals, have to suppress low variety forms, when they use written standard language, bilinguals additionally have to suppress (unintended) activation of the language not-in-use. This appears to be an extra monitoring effort, which is not present in monolinguals.

Some of these differences may change the way, the written modalities develop in bilinguals. In the following part, 2.4., we take a closer look at differences (4) - (6). They deal with faculties, which play a central role when children learn the principle of decoding, i.e. to convert written forms into linguistic messages via phonological forms.

2.4. Difficulties in (simultaneous) alphabetisation of bilinguals

A child brought up in two languages has to acquire almost twice as many complex signs than a monolingual child and does not receive the same amount of experience for each language. Yet that child is expected to keep up with the normal pace of language acquisition. This not only requires an extra effort, but also an introduction of supporting strategies. It can be assumed that bilingual literacy acquisition is to a great deal influenced by these strategies, too. In the following I present bilingual features, which (may) lead to difficulties in simultaneous alphabetisation.

A good example for the features in question is, that bilingual infants tend to perceive similar L 1 and L 2 sounds as the same sound, because of phonetic interdependence of their languages (Durgunoglu 1997, 268). Indeed, certain levelling can handicap the acquisition of distinctive features. Sebastián-Galles & Kroll (2003, 292) report such problems in Spanish-Catalan-childhood bilinguals with two *e*-sounds, allophones of one vowel phoneme in Spanish, and two phonemes in Catalan (equidistant constellation). In Catalan, subjects classified both *e*'s as one phoneme. In SLA (second language acquisition) this effect is well known as equivalence classification (Flege 1987, 34). Levelling phenomena, still present in literacy

acquisition delay the learning of transcription rules, which represent the levelled-out difference. In 2.4.1. we propose German vowel length as a possible candidate of levelling in Spanish-German bilinguals. Another levelling phenomenon concerns differences in writing systems. As reading experiments with bilingual children and adults show, bilinguals process each of their writing systems differently from monolinguals. In 2.4.3. this mechanism is described in detail, and Spanish and German writing systems (both shallow) are compared with a view on systematic differences.
Two further bilingual features, whose impact probably is observable in (Spanish-German) alphabetisation, are holistic processing (see below) and delay of language-specific minor rules. In 2.4.2. I describe Spanish and German stop systems, which differ in some language-specific major and minor features. Hence, we can expect that they are acquired relatively late by Spanish-German children, and as long as minor rules concerning stops are not acquired, stop spelling will be insecure. Finally, in section 2.4.4., holistic processing is presented. It will be argued that it speeds up language acquisition and language processing, but simultaneously creates conditions, which might retard alphabetisation.

2.4.1. Development of system differences - Spanish and German vowel systems

In the first acquisition period bilingual infants do not distinguish their languages. Leopold (1949 vol. 3, 183) observes that the speech sounds, his English-German brought-up daughter Hildegard produced, seemed to be language independent in the first two years. With about three years bilingual children produce language-specific phonemes (Sebastián-Galles & Kroll 2003, 281). The separation process shows that systemic distinctions develop gradually. Difficult ones develop late and equidistant constellations, such as in the Catalan-Spanish example mentioned above, seem to be especially difficult to systematise by bilinguals (loc. cit., 287, Grab-Kempf (1988, 101)). As table 2.1 shows, a case in point probably are the Spanish-German vowel systems.

Place of articulation		Front Unrounded Rounded	Not front	Back and rounded
Vowel height	Close, Spanish /	i -		u
	German	i ɪ y ʏ		u ʊ
	Close-Mid, Spanish / [- open][- close], German	e -		o
		e ɛ ø œ		o ɔ
	Open, Spanish /	-	a	
	German	ɛ:	a: a	

Table 2.1: Spanish and German vowel systems, according to Hidalgo et al. (2004, 122) and Kohler (1995, 171).

Whereas in Spanish neither vowel length nor the quality of two similar vowels lead to two different phonemic representations[5], German pronunciation and spelling require such distinctions. In other words, two phonemic systems are mapped onto phonetological, orthophonic reality. Our hypothesis is that in a transitory phase neither length nor quality are characteristic in Spanish-German children, because in Spanish, difference in length is not phonemic and lax vowels do not exist and in German these differences are neglected or ignored.

Our hypothesis explains why difficulties arise: Final system differentiations, such as vowel length, which have to be taken into account in spelling, are perceived but not systematised. Sebastián-Galles & Kroll (2003) observe similar difficulties with the Catalan /e/ - /ɛ/ contrast in early, consecutive Spanish-dominant bilinguals: "[I]n spite of detailed recording of acoustic information by the auditory/speech perceptual system, this information is not integrated into the language processing system" (loc. cit, 293). In case studies 2 and 3 (see 5.2.2. and 6.2. below) we will look at persistent difficulties with orthographic correspondences of vowel length or tenseness. In the case studies we use the term "vowel length" to refer to these distinctions in the sound systems.

5 Only across morpheme bounderies vowel length is sometimes distinctive: *Santa Ana* vs *Santana*, *a apagar* (*to turn off*) vs *a pagar* (*to pay*, *payable*), etc.

2.4.2. Development of realisation rules - Spanish and German stops systems

The transition from phonological entities to actual pronunciations is a process of successive applications of rules, such as reduction and assimilation. These rules are language specific, for example not every assimilation is present in every language. The transformational part of phonetology may be fundamental for some orthographic difficulties in bilinguals. Our hypothesis is that such difficulties arise from realisation phenomena rather than from differences between the (phonological) systems. This becomes particularly clear in Spanish and German stop systems, where the systems seem similar, but the realisations differ:

Kohler (1995, 157) distinguishes German /b/ from /p/, /d/ from /t/ and /g/ from /k/ first and foremost by aspiration. /p/, /t/ and /k/ are breathed in most of their environments. Instead of aspiration of the stops, in /pr/, /tr/ and /kr/ the sonorants are less voiced or devoiced (loc. cit., 158). "Voice" has to be excluded as the crucial distinctive feature, because /b/, /d/ and /g/ are fully voiced only in intervocalic position (ibid.). In the coda they are always devoiced. However Spanish /p/, /t/, /k/ in natural speech are realised nearly always with total closure of the oral tract (Hidalgo & Quilis 2004, 191), and certainly always without aspiration (Grab-Kempf 1988, 93). Only in postnuclear position, Spanish oral stops are neutralised with respect to mode of articulation and voice (Quilis 1981, 191), which means in postnuclear position it is difficult or impossible to distinguish the pronunciation of <b> from <p>, <d> from <t> and <g> from <k>. For example *acto* (*event*) and *signo* (*sign*) are both produced with a velar, voiced fricative. Spanish /b/, /d/, /g/ are realised as fricatives in nearly all phonological contexts[6]. They are only produced as stops following a speech pause, or sometimes when preceded by a homorganic liquid or nasal as in /mb/, /ld/ or /nd/ (Hidalgo & Quilis 2004, 153). In these contexts they differ in voice from their unvoiced counterparts (loc. cit., 154). In general, syllable initially they are voiced (Grab-Kempf 1988,117), while in German fluent speech these stops, syllable- or word-initially, are only fully voiced if preceded and followed by vowels (see above). This difference in the two systems, i.e. the difficulty of finding a clear distinction between German /b/ and Spanish /p/ in some context can induce Spanish-dominant bilinguals to use *p* where in German *b* is required.

To summarise, comparison of German and Spanish oral stop systems suggests that they differ in important distinctive features, such as German ±

[6] An overextension is the fricativisation of German /b/ in Spanish dominant late bilinguals.

aspiration[7] and Spanish ± friction accompanied by ± voice. Syllable-initial voice is distinctive in Spanish, in German only sometimes. We can assume that German-Spanish bilinguals initially build one levelled system for the perception of the similar phonetic aspect "voice", as suggested by experimental results on phonetic discrimination and production in bilinguals (such as Obler & Gjerlow 1999, 128). Both languages contain variants where one cannot distinguish /b/ from /p/, /d/ from /t/ or /g/ from /k/ on the basis of the mentioned features, for example unvoiced from unaspirated variants in German and postvocalic variants in Spanish. Hence, further phonetic features, phonotactics and morphology and more background knowledge about phonemes play a role to discriminate each allophone correctly (Mompeán González 2004, 440 ff). Probably these features, like minor rules, are acquired after the phonetic cardinal features. Possible problems disappear, when minor transformational rules or visual word images are consolidated. The following can be assumed in syllable-onset position with some certainty:

- A stop if aspirated is German /p/, /t/ or /k/
- A stop if voiced is German or Spanish /b/, /d/ or /g/
- Fricatives can be realisations of Spanish /b/, /d/ or /g/.

[7] Aspiration is an auditive feature. The phonetic realisation of this feature is VOT (voice onset time).

Table 2.2 shows the differences between the two stop systems and pronunciation variants in both languages:

		German	Spanish
/b/, /d/, /g/	as stops	always	- after speech pause - in /mb/, /nd/, /ld/: [umbaso], *un baso* (*a glass*)
	as fricatives	never	else: *el baso* (*the glass*)
/p/ , /t/ , /k/	as fricatives	never	postnuclear: *acto* (*event*)
	as stops	always	else
/b/, /d/, /g/	aspirated	postnuclear: *Rad* (*wheel*)	never aspirated
/p/ , /t/ , /k/	not aspirated	before /l/ and /r/: *Krach* (*noise*)	
	aspirated	in most environments	
/b/, /d/, /g/	not or less voiced	- postnuclear: *Rad* (*wheel*) - after speech pause or voiceless sound: *...scheußlich, doch...* (*...awful, but...*)	Occasionally postnuclear: *Madrid*
	voiced	intervocalic	else
/p/ , /t/ , /k/	voiced	never	postnuclear: *acto* (*event*)
	voiceless	always	else

Table 2.2: Pronunciation variants of German and Spanish stops.

In case study 1 (see 4. below) we will look for evidence for our hypothesis that orthographic difficulties with German and Spanish stop systems in bilingual children are due to a delay in the acquisition of minor transformational rules, or if eventually other causes are involved, such as interrelations between phoneme systems.

2.4.3. Comparison of orthographic principles in biliterates

Psycholinguistic research in reading and writing is concerned with the depth of a writing system. Deep orthography is based on an internal representation of speech, not on actual pronunciations. In English, correct spelling and reading depends strongly on the acquisition of orthographic representations of words or morphemes as a whole. By contrast, Spanish and German orthographies are classified as more shallow. By and large, letter-to-sound correspondences guarantee correct pronunciation. On the deep/shallow scale German is more shallow than English, but

Spanish is even more shallow than German. In Spanish, phonetological[8] spelling rules overrule orthographic consistency of lexical entries while in German orthographic consistency of lexical entries is a strong principle and that is why morphemic spelling rules override phonological rules.

Some examples shall elucidate this difference. German word forms, belonging to the same lexical paradigm look as similar as possible visually, even if they sound differently. For example the word forms <Hals> (*neck*) and <Hälse> (*necks*) correspond visually within all four letters of the stem, the plural form has an additional umlaut-diacritic. However, phonetic form of both words, [hals] and [hɛlzə], differ in two segments. As a consequence of this morphological principle, for an appropriate use of German orthography, one has to rely heavily on orthographic representations of lexical entries. In other words, many rules of German orthography depend on word formation. Quite the reverse is the case in Spanish: To preserve phonological consistency, the orthographic representation of a lexical entry can be changed. For example, <poco> (*a little*, *few*) changes to <poquito> (*a bit*, diminuitive of *poco*) because a high-vowel-preceding <c> has to be pronounced [θ]. <c> and <g> have two context-dependent pronunciations in Spanish. The orthographic patterns of all verbs, with infinitive ending in <-cir>, <-cer>, <-gir>, <-zar>, <-car> and <-gar> are affected by orthographic changes in the stem of the verb[9].

Of course Spanish also makes use of word-consistent spelling, e.g. in homophone disambiguations, and certainly the Spanish reader/writer does access orthographic representations directly, as a study by Sebastián-Galles (1991) underlines, where pseudowords were classified as words, if they looked similar to words (loc. cit., 476). It can be assumed that for any alphabetic writing system, the direct access to lexical orthographic representations is most appropriate for fast word access, while sound-to-spelling-conversion rules and spelling-to-spelling-conversion rules are most appropriate for new words. In processing words, the Spanish reader/writer must observe certain variations in pronunciation. The German reader/writer must learn to disregard such changes. During a transition phase, the Spanish-German individual probably is retarded, because she/he has to learn to handle both systems, the phonology-based Spanish and the morphology-based German. The crucial question for this study is, how the Spanish-German individual learns to differentiate his reading and writing strategies. Unfortunately, no literacy

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8 We use the term "phonetology" to describe the area where phonological representations are transformed into phonetic reality.

9 The mentioned verbs are not rare, their type frequencies are the following: <-cir> 41, <-cer> 79, <-gir> 13, <-zar> 121, <-car> 129, <-gar> 80 (Campa et al. 1996).

studies on German-Spanish bilinguals can be found, although, growing research interest in biliteracy exists.

Most of the actual studies on biliterates have found an influence of the shallower script on the deeper one and vice versa. In a study with Italian-English, Japanese-English and English participants, reaction times in a visual word-recognition task in English were faster on homophones in the Italian group (Sasaki 2002). At the same time their reaction accuracy was worse. The Italian writing system is shallower than the English, the Japanese deeper. The author interprets this result with stronger phonological involvement in Italian-English bilinguals. Bialystok et al. (2003) observe an advantage on an English phoneme-segmentation task in Spanish-English first graders compared to their Chinese-English and monolingual peers (loc. cit., 27). Wang et al. (2003) suggest that the Chinese reader of English prefers the direct use of the pathway to semantics, whereas the monolingual English reader also relies on sublexical phonology (loc. cit., 131). However, Klein & Lewin Doctor (2003) report stronger phonological recoding in Afrikaans for Afrikaans-English bilinguals at the age of twelve, since Afrikaans has a more regular writing system than English (loc. cit., 133). They observe "... more use of a whole-word, lexical processing strategy for reading their deeper language." (loc. cit., 136)

If these research results are valid for other language combinations, we would expect Spanish-German biliterates to make stronger and maybe longer use of phonetics/phonology than German monoliterates during a transitory phase of their alphabetisation. In this case, the grade of levelling could be seen as a function of the depth distance between the German and the Spanish writing systems. Later, some occasional interference of the shallower writing mode is still possible.

In sum, in German graphotaxis, morphological rules override phonological rules, in Spanish it is the other way round. During alphabetisation, some visible interrelations are expected in Spanish-German bilinguals, because crucial German writing principles are not consistent with Spanish writing rules, as the following table illustrates.

	Spanish	German
phonological principles	consistent	many exceptions
morphological principles	many exceptions	consistent

Especially in case study 2 (see 5.2.2., 5.2.4. and 5.3.1. below) we deal with the question, to which extent a shallow writing mode can intrude on German writing.

2.4.4. Holistic processing in alphabetisation

Holistic processing, the opposite of analytic processing, is not a central notion in research on bilingualism. Yet it seems to be a fundamental feature of bilingual language acquisition to speed up processing. In an auditive holistic processing mode sound perception is semantic-based and children perceive characteristic sound features instead of strings of sounds. In visual holistic perception a global visual pattern is parsed and matched with stored figures and frequent stimuli are recognised faster than in visual analytic perception (Pishwa 1998, 26). Early semantic-based perception in bilinguals is triggered by early synonymity, which helps the child to distinguish between form and content (see 2.1.3. above). As a consequence "[a] bilingual child will pay more attention to things referred to, situations and actions described, and ideas expressed than to phonetic form pronounced" (Leopold 1949, vol. 3, 182). Direct evidence for semantic-based processing in bilinguals is reported in Albert & Obler (1978, 204). The authors describe an experiment where 4 - 6 year-old bilinguals tended to only rely on semantic features in a decision task on word similarity, whereas monolinguals of the same age range also relied on phonetic similarity. Analoguous to semantic-based, phonologically underspecified processing in spoken language, it is likely that bilingual literacy novices rely earlier and perhaps longer than their monolingual peers on a strategy where they rather recognise written words as whole visual patterns than as strings of letters. Some of Bialystok's experimental data from bilingual and monolingual literacy beginners (5 - 7 years of age) suggest that also in written-language processing bilinguals prefer a semantic-based strategy. They tended to understand better than their monolingual peers that written words do not change their meaning moving them from one picture to another, and that long/short word images do not necessarily designate big/small objects (Bialystok & Herman 1999, 38). Preference for visual holistic processing may be favoured by certain bilingual faculties, such as equally good perception for both visual fields (Albert & Obler 1978, 193), or the ability of quick visuospatial processing in bilinguals.

Nevertheless, both, analytic and holistic strategies, are necessary in reading and writing. Our hypothesis is that in a transitory phase, analytic processing is underrepresented in alphabetisation of bilinguals, who more than monolinguals rely on holistic processing before full alphabetisation. The following tabulation sums up possible consequences of holistic processing and underspecification, which may

negatively influence literacy acquisition, as well as reading and writing performance:

- Isolated holistic processing gives rise to confusions of similar looking words in reading and writing.
- The matching mechanism of holistic processing supports writing by analogy.
- Underspecified phonological representations can be considered as a transient phonological-discrimination deficit, compared with monolinguals.
- Underspecified perception may cause letter exchanges in the first years of alphabetisation, because neither in an auditive nor in a visual holistic processing mode the focus is on segmental order.
- Possible (long-term) consequences of insufficient attention on segmental order and overreliance on writing by analogy are delays in the building of an inventory of fully specified complex orthographic representations.
- Automatisation of inadequate processing mechanisms may raise the risk of producing slips like anticipations, perseverations or interferences at an advanced alphabetisation stage.
- Preceding and following words prime the retrieval of the target word.
- Lexical organisation, both vocabularies in one big wordstore, may lead to retrieval of a target word in the non-activated language.

In all four case studies we will focus on evidence for holistic-processing phenomena, which might show up as order errors, interferences, false word retrieval and/or context impact.

In 2.4. we have seen that phonetological development is essential for successful formation of the following alphabetisation abilities:

- Syllable segmentation and speech-sound segmentation.
- Phonological systematisation.
- Conversion from speech to script.

And for all three abilities we have provided evidence for the fact that phonetological development differs between mono- and bilinguals before alphabetisation and when

alphabetisation starts.

3. Study design and method

3.1. Research questions

Bilingual language development in a bilingual school environment is influenced by the following general circumstances:

- Bilinguals have a twofold processing effort, aquiring two languages.
- Bilinguals have less exposure to each one of their languages.
- Biliteracy is less common and more complex than bilingualism and requires an additional effort.

Bilinguals make use of their cognitive style as well as of universal linguistic patterns, their possible variation, and individual learner strategies. Recent research has shown that bilinguality changes the conditions for literacy acquisition, grammatical and lexical formation and language processing. All these parameters are especially important in the development in the written modalities, and this study focuses on the following areas with impact on alphabetisation and skilled reading and writing where differences between bilinguals and monolinguals can be expected:

- Development of phonological awareness.
- Interrelations between sound systems.
- Perception of oral speech.
- Processing of written material with possible language differences.
- Reading strategies based on grapheme-phoneme correspondence, on cluster- and morpheme identification and on holistic word recognition.
- Development of semantic awareness.
- Development of the lexicon, processing in the lexicon and interrelations in the lexicon.

To discover, how bilinguality changes the process of literacy acquisition, we derive the following research questions for this study:

1. Are phonological skills which are relevant for literacy differently developed in bilinguals compared to monolinguals during the same stage of alphabetisation ?

2. Are processing modes for written material differently developed in bilinguals compared to monolinguals during the same stage of alphabetisation ?
3. Are grammatical skills, relevant especially in the written variety, differently developed in bilinguals compared to monolinguals during the same stage of acquisition ?
4. Are morphologically complex lexical entries differently organised in bilinguals compared to monolinguals during the same period of schooling ?

3.2. Participants and educative method at school

The observed population of this study were seventeen bilinguals between six and fifteen years, simultaneously alphabetised in two languages. They lived in Madrid and fourteen of them were brought up in a Spanish environment, but certain activities went on in German. All children were pupils in a German school in Madrid, "Deutsche Schule Madrid" (DSM). DSM uses a total immersion method of teaching: The dominant classroom language is German. The students are taught Spanish history, political science and Spanish language in Spanish by Spanish teachers, while all other subjects are taught in German by German teachers, except foreign languages, which are taught primarily in the foreign language. Commonly, in sports and music both languages are used by teachers and pupils.

Out of our sample, case histories of four participants were selected. All four are early bilinguals and each case was selected to analyse in depth one of the research questions. The longitudinal study covered the period of several academic years with individual participation ranging from two to five years. For two participants, Albert (A.) and Daniel (D.), both nearly eleven when the survey began, German was the preferred family language or used at least as frequently as Spanish. Elias (E.) and Jorge (J.), eleven and eight years, had their first vast exposure to German with three, when they entered DSM kindergarten. The development of the grade mates E., D. and A. can easily be compared, and spelling data from J. and D., both poor readers, can be related in certain aspects. On occasion, I relied on data from other pupils of the observed population for comparison. Most biliteracy studies focus on the early stages of alphabetisation, or on biliterate adults. Our study bridges a gap in this field of research, focusing on biliterate development and performance from the end of basic alphabetisation onwards, when demands increase at school to

understand and produce written texts.

As the population in this study are pupils from DSM, I want to take a brief look at the alphabetisation method used there, as well as at some linguistic recommendations for school education and alphabetisation in two languages. As various studies have shown, for children acquiring two languages it has to be ascertained that at least one language develops adequately. If this is the case, one can look after the other language (Swain 1983, 101, Krashen 1989, 69 ff). For example, bilingual schools should take care that alphabetisation does not begin in the weaker language when the individuals' oral capacities have not yet reached the required threshold level (Durgunoglu 1997, 269). For bilingual classes two possible alternatives are reported: Two teachers, one for each language coordinate alphabetisation together (Nehr et al. 1988, 12 ff) or bilingual teachers teach the class (Oller & Eilers 2002, 23). Like this, analogies and differences between the two systems can be taught and explained in a coordinated and controlled way. Otherwise, the bilingual child has to analyse similarities and differences between the two systems on his/her own. This cognitive extra load may cause developmental delays.

At DSM, from form one onwards reading and writing instruction is carried out separately in German and Spanish. In German language arts, children are classified as DaM (Deutsch als Muttersprache) or DaF (Deutsch als Fremdsprache) pupils, i.e. as children with German as their mothertongue or children with German as a foreign language. Until the end of grade 3 the resulting groups take two German lessons per week separately. From grade 4 onwards the number of lessons increases to three, or even four. Pupils, who fail to reach certain class norms, such as poor spellers, attend additional assist hours, "Förderunterricht", if problems show up in German language arts, "clases de apoyo", if problems show up in Spanish language arts.

3.3. Material

This study largely opted for a longitudinal presentation, although most of the empirical work on bilingualism is cross-sectional (Hamers & Blanc 2000, 89). For our aim to identify and systematise certain biliteracy features in Spanish-German children, a great deal of longitudinal data were necessary, which allowed a safer interpretation of the registered phenomena and an observation of the development of our participants. To succeed in identifying bilingual patterns of alphabetisation I

carried out a detailed error analysis of predominantly written data. A total of 71 written texts were collected, 53 German school essays [10], 10 Spanish or German dictations and 8 drafts in Spanish or German. The resulting text sample included about 20000 words, and for each participant were divided into 12-months intervals, such as the second half of grade five and the first half of grade six (grade 5/6). Data were completed by samples of word-list reading and text reading, word and non-word dictations, and exemplary material from spontaneous written and oral speech. Most additional data were obtained from the results of Spanish and German literacy batteries (see below). Data analysis was primarily qualitative and frequency values were added to illustrate a development, to back claims of preference or productiveness of strategies, etc. I opted for school essays as the primary study-data format, because unlike the unnatural circumstances in psychometric procedures or dictations, essays can be classified as a genre of naturally ocurring written samples, in which time limitations and a limited access to reference tools, such as dictionaries, exist. In drafts, on the other hand, important norms of written language, such as transcription of explicit pronunciation, are more likely to be ignored.

To estimate the type of multilinguality, case-book notes[11] and results of the language-background scales were analysed. The acquisition history of each participant helped to understand individual strengths and weaknesses in their language development.

Cognitive prerequisites for alphabetisation, i.e. perception and short-term memory, were assessed with the Figure-of-Rey test for visual perception and memory (Figure of Rey 1959), and the corresponding subtests of the Wechsler Intelligence Scale for Children, Spanish and German versions (WISC (1993) and HAWIK (1999)). Reading and writing skills were compared with monolingual norms with a mainstream assessment in Spanish and German, including the following psychometric procedures:

DRT 2/3 (1997) / 4 (2003) / 5 (2004) - Diagnostischer Rechtschreibtest, Writing test for German
ZLT (2003) - Zürcher Lesetest, reading-fluency and -accuracy test for German
ZLVT (2002) - Zürcher Leseverständnistest, reading-comprehension test for German
TALE (1990) - Test de análisis de la lecto-escritura, Reading and writing test for

[10] The essays are of all text types, which are offered in the respective school grades.

[11] The case books contain interviews with parents, observations of performance in school and in linguistic sessions and other information, which gives insights into multilingual histories and individual cognitive styles.

Spanish

3.4. Error analysis

The collected material was analysed, applying various tools. The main method / instrument was qualitative error analysis. In decontextualised language, the following linguistic structures, principles, or mechanisms were observed:

(1) Constructions with particle, or prefix verbs
(2) Word-formation entities (compounds, derivations)
(3) Grammatical case markers
(4) Graphotactical principles (morphological or phonological)
(5) Language-specific characteristics of German orthography (geminates, grapheme ambiguity, capitalisation)
(6) Transcription of similar phonemes of Spanish and German (length/tenseness of vowels, stop systems, *s*-phonemes)
(7) Retrieval mode, i.e. lexical look-up, sublexical or letter-by-letter processing, and quality of lexical look-up and lower-level processing.
(8) Transcription mode (shallow or deep)

To classify the data, use of error-analysis parameters, as well as consideration of psycholinguistic phenomena, were helpful. Both are elucidated in the following sections 3.4.1. - 2. The (sub)classified data were ...

- ... analysed on the basis of research on bilinguality and literacy (acquisition).
- ... analysed with attention to differences and similarities of written Spanish and German.
- ... compared with data of monolinguals.
- ... compared between subjects of our population.
- ... compared across phases to establish thresholds in the development of single participants.

3.4.1. Competence and performance errors

For our aim to identify bilingual factors in alphabetisation, the determination of the nature of an error will be crucial. For this issue the main distinction between performance/superficial and competence/underlying errors is used:
Competence errors are lasting deviations, referring to ill-formed rules, concepts or representations (mental-lexicon errors), or to gaps in the mental lexicon. Competence errors show up, when the speaker/writer has ...

- ... not yet acquired a rule or not transferred it to its domain.
- ... acquired a rule incompletely.
- ... developed false rules, concepts or representations.

Within the competence errors we can describe the type of a deviation through the distinction between the norm and the system. According to Coseriu (1988) the system represents the whole of the linguistic structures, possibilities and functional oppositions of a language (loc. cit., 270). In the system we have to distinguish between main classes and rules and minor rules, for example phonology and functional phonetics. Phonological competence problems in bilinguals are often levelling phenomena, as the one with German vowel-length distinctions, described in 2.4.1. above. An example of a competence problem with functional phonetics in bilinguals is delay in the acquisition of Spanish-German minor rules of stops, described in 2.4.2. above.

In the system, conforming and conflicting rules and principles exist. Examples are the forms of irregular verbs where different patterns are in conflict (for example *reiten* (*ride*), *ritt* (*rode*), *geritten* (*ridden*), etc., and *schreiben* (*write*), *schrieb* (*wrote*), *geschrieben* (*written*), etc.) The virtual potential of the system is confined by the norm, which pins down actual usage (Coseriu 1988, 268). Many errors arise from norm deviations, which conform to the system (loc. cit., 269). Candidates for norm deviations, i.e. exceptions of productive patterns are isolated forms (auxiliary-verb forms etc.), or spellings of lexicalised borrowings (in German *Café*, *Metier*, etc.). According to Eisenberg & Fuhrhop (2007, 25 f) graphotaxis deals with the unmarked part of the written vocabulary and contains its productive regularities and subregularities. On the contrary the norm can differ from the system by establishing irregularities: Orthographic norms can violate the writing system (loc. cit., 26).

While competence errors reflect the presence of false or incomplete linguistic

rules or representations, performance errors are the consequence of applying inadequate retrieval mechanisms (retrieval carelessness), such as an occasional unsuccessful reading attempt where an input letter string is matched with the wrong word representation. Performance errors of another type are due to an erroneous execution of already (correctly) retrieved items (execution carelessness). These performance errors are momentary deviations, emerging as slips of the pen. Letter anticipations or perseverations often can be classified as pure lapses, caused by writing too fast, writing with reduced concentration, or processing more than one activated string at the same time. Context impact is another possible cause for the appearance of performance errors. For example, the slip *Man verschloss sie in irre Kerker*. (target *ihre*)[12] may be attributed to the environmental influence of the numerical superiority of the lax vowels within the sentence (context influence), or/and to retrieval carelessness (retrieval of a neighbor). It can be assumed that lexical performance errors tend to be caused by retrieval carelessness. The output of retrieval carelessness is an error of lexical selection. It is or contains a lexical unit. Pseudohomophones and homophones appear to be the group of slips of the pen where the lexical look-up at least was phonologically correct. Neighbors and contaminations (retrieval of a synonym) on the other hand, fail this criterion. Blends are a special case of lexical look-up problems: Various lexical possibilities are accessed simultaneously and, according to their phonology, superposed on one another. Slips, not involving the lexicon, are usually caused by execution carelessness. Writing by analogy instead of retrieving an orthographic representation, can be another cause for slips of the pen, indicating a sublexical writing mode, such as <dier> instead of <dir> (*you* dative).

In some cases it is difficult to decide whether we deal with performance or competence errors:

- Pseudohomophones, homophones and blends are also explainable as competence errors where the mental lexicon contains erroneous orthographic representations, missing or wrong connection to concepts, etc.
- In less frequent items, analogies can be interpreted as ignorance of rule restrictions, i.e. competence errors.

Performance errors are triggered by factors such as anxiety, haste, fatigue, excitement or distraction. Note, however, that competence skills also can remain

12 *They were shut in their* (target)/*crazy* (attempt) *jails*.

unactivated under these circumstances. Potential bilingual factors, which can trigger performance errors are shallow writing and holistic processing, described in 2.4.3. - 4. above.

3.4.2. Error interpretation

In this study error terms are used in the following way:
General term: Deviation (from the norm).

Specific terms:

- Competence error or competence mistake: Deviation caused by a gap in competence or incomplete application of rules.
- Performance error, lapse and slip: Deviation caused by lack of attention or split attention to more than one activated string.

The term error, used alone, is not further specified, whether it is caused by a competence or performance phenomenon. Although this application may be different to others, for example Pit Corder (1982), it prevents that an error analysis is understood as an analysis of competence deviations only. In the following, parameters are presented, which are important to decide from case to case, whether we deal with a competence or a performance phenomenon:

Error frequency:

- If a deviant word is self-corrected, we can assume an occurrence of a performance error. Self-corrections indicate that the writer knows more about orthography than she/he applied when producing the lapse.
- A nonce mistake, a word, written several times correctly in the same text, or in the texts of the same observation period, and misspelled only once, is a clear indicator for the presence of a performance phenomenon.
- Reoccurring errors: The more often a word is spelled correctly, the more likely a deviation has to be interpreted as a slip of the pen. On the contrary, a word, more often misspelled than spelled correctly, suggests that the concerned rule is not yet consolidated, or automatised. These errors give insights in transitional, intermediate stages of language development. In contrast to the appearance of system errors, the

appearance of reoccurring errors is highly context sensitive (see 6. Case study 3).

- Error repetition does not give further insights into processing quality. It rather points to a competence problem and the comparison of type-frequency values at different dates shows progress in the mental lexicon and the handling of the orthographic system. In longitudinal observations type and token values must be taken into account. Token values alone might obscure the visibility of developmental steps (in alphabetisation).

Effects of activation threshold:

- The frequency effect, i.e. the fact that highly familiar items are activated more easily than their competitors, suggests that frequent items more likely trigger performance errors than rarely retrieved items, because of their low activation threshold [13]. Ferstl & Flores d'Arcais (1998, 178) consider word frequency, recent activation, subjective familiarity with a word and its concreteness as factors with impact on actual node activation.
- Context information: Phrasal or situational contexts favour or disturb target selection out of a quantity of competitors (see *crazy-jail* example above), by priming the activation state of lexical entries (Dijkstra & van Heuven 2002, 182, 188, Levelt 1991, 356), e.g. the actual discourse primes the according vocabulary positively.
- The homophone effect, whereby various phonologically similar candidates are activated at the same time, also triggers performance errors.

As we have seen in 3.4.1., frequency as well as homophony phenomena can be due to both, competence or performance problems. The following example shows, how error-frequency values can contribute to interpret error data:
The substitutions <wen> (*whom*) and <den> (*the*) instead of <wenn> (*if*) and <denn> (*because*) were constantly observed in our error samples until grade 4, in

[13] It is assumed that word access requires specific activation of lexicon entities, and that each lexicon entity, also called logogen or node, has an individual threshold level of neuroenergetic activation. When a node's threshold is exceeded, as a result of lexical or sublexical processing, this node gets activated and it spreads its activation to connected nodes on another level in the mental lexicon (Levelt 1991, 202, 352). The output of this activation flow is the retrieval of word forms for further linguistic use. Frequent items are supposed to have low activation levels, because experimental data suggests that they are activated with more ease than other items.

some subjects even longer. Targets and attempts sound and look similar, and attempts are words, more frequently used. When substitutions <wen> and <den> are repeated errors, they might be due to a competence problem, such as levelled-out vowel-length distinction in German (see 2.4.1. above). When they are nonce mistakes, on the other hand, they may be due to a performance problem, for example triggered by writing in a holistic mode where items with a low activation threshold, such as *wen* and *den*, intrude easily.

4. Case study 1 – Insecurities with the spelling of stops triggered by minor-rule delay

In the first case study a Spanish-German bilingual with Spanish parents is presented. His literacy development was observed in grades 3 and 4, focusing on spelling of Spanish and German stops. The results show that language-specific minor features of stop recognition were acquired with a delay and that holistic processing had visible impact on spelling problems until the end of grade 3. The participant's development provides evidence for the claim that bilinguality helps to detect alphabetisation problems at an early stage and that transition phenomena, like the ones described here, can be overcome relatively fast.

4.1. Developmental and academic history

The first participant of this study, J., was observed for two years. At the beginning of the survey, the eight-year-old student attended the third form of DSM, Deutsche Schule Madrid (German School Madrid). He lived with his parents, both employed lawyers, his older brother and sister, a German au pair girl and a Spanish-speaking nursemaid. J. and his family can be viewed as privileged individuals, who learn more than one language for their own benefit. J.'s parents are both Spanish, but his father completed German secondary school-leaving examination (Abitur) at DSM. At the age of three J. went to a German kindergarten in Madrid, afterwards he attended pre-school at DSM. Growing exposure to German therefore can be assumed from three years onwards. In general J. was a quiet and reserved boy, who did not talk fast nor much neither in Spanish nor in German.

According to Hamers & Blanc (2000, 27), his bilinguality can be described as follows:

(1) Consecutive childhood bilinguality: Language acquisition commenced in Spanish, more and more German followed, clearly before age eleven.
(2) Endogeneous bilinguality: A German community is present especially at school.
(3) Additive bilinguality: Both Spanish and German are socially valorised, a fact that favours cognitive advantage.
(4) Monocultural bilinguality: J.'s cultural identity was primarily Spanish. Until the end of the survey, he visited Germany only one time.
(5) Dominant bilinguality in direction of balanced bilinguality: Higher

proficiency in Spanish than in German. He used many borrowings from Spanish.

(6) Partly compound bilinguality.

According to a psychological questionnaire for parents, J. began to speak late and stuttered approximately until age four. Until the end of the survey, he often expressed himself haltingly, often because of word retrieving problems. Sometimes it was hard to understand what he was trying to explain. Additionally, the parents noticed uncertainties in correct past-tense formation in Spanish. Finally, they noticed that it was hard for him to understand more than the direct meaning of an ambiguous utterance. When he was seven these reports and his unsatisfactory literacy development were diagnosed as delayed acquisition. It has to be mentioned at this point that his brother and sister had literacy problems too, and his father also had them in school. Such delays are natural and transient in bilinguals.

4.1.1. Language background

At the age of eight J. reported the following language use with family members, outside the family context and for daily activities. The only persons, with whom he talked in German more than in Spanish, were most of his teachers and the German au pair, who also helped him with his homework. That he read more in German than in Spanish was due to school-reading. But surprisingly, in his spare time he also read more in German than in Spanish. This was even true for comics. With his father and his friends at school, the use of German and Spanish was balanced. When asked whether in informal situations, especially with friends, code switching and borrowing occurred, J. said no. So he either did not use switching and borrowing or he was not aware of it, or felt he should not use switching and borrowing.

In his self-report J. may have exaggerated the amount of use in German to impress me, the German interviewer. However, the report shows that he used German with his father and friends voluntarily and even to express emotions rather than academic content. Here we have an example for use of German for reasons of pleasure. The same goes for communication with his brother and sister, except that with them Spanish was used more often than German[14]. Probably the most emotion-

[14] This situation reminds of the one described by Saunders (1988) where father and sons use German as one home language, although it is not the language of the environment, nor is the father a native speaker of German.

driven communication contact for an eight-year-old boy, the one with the mother, in J.'s case took place only in Spanish. All in all, in more academic contexts German slightly predominated, whereas the language for emotions tended to be Spanish. But for both functions the two languages were used. By number and weight of activities Spanish was dominant and preferred at a rate of about two to one. His interior communication, his thinking, was Spanish for all purposes. Even thinking in the German lesson took place in Spanish, and he never dreamt in German, as he remembered.

The boy travelled to Germany for one week for the first time when he was eight, visiting a Spanish-German couple with children with whom he mostly talked in his dominant language. In interviews and training sessions treating his reading and writing problems in German we both nearly exclusively talked in German. During the first three months, he constantly repeated my German questions in German, as if he wanted to make sure that he understood well, or as if he began to really concentrate on the conversation at the moment the question was asked. When his Spanish was treated, the same phenomenon occurred. If we assume then that monitoring his own attention was not easy for J., we have to conclude that his "wandering" attention affected his performance in school, too.

4.1.2. Performance in school and in psychometric procedures

In grade three J. got tired when attending to learning topics and his concentration decreased fast. In school, he had to be roused to listen, regularly. It appeared difficult for him to keep his attention. His teacher reported that for his age and especially for the third form at DSM the boy seemed to be immature. His ability of monitoring his attention by himself was weak and needed improvement. Surely, his slightly delayed cognitive development caused some of the immature behaviour at school. J's German dictations show that in practised material he did rarely produce errors. He memorised word images reasonably well, reproducing them correctly under exam conditions. Errors mainly occurred in new material. Nevertheless, his dictation marks in second form were satisfactory in both languages, but in German the teacher, caring about his orthography problems, advised the parents to think about a literacy training. Treatment began at the start of the third form. In the first quarter of the new schoolyear, exam marks were poor, but from the second quarter on he obtained satisfactory to good results.

At the age of eight, J. performed significantly worse in an attention-span task

than in a concentration task, both part of the verbal battery of the Spanish version of the Wechsler Intelligence Scale for Children (WISC 1993). The concentration task demands mathematical problem solving like “Fritz has got four candies and his mother gives him two more. How many candies has he got now ?”. Tasks get more and more demanding and the child is given a solving span from thirty to forty-five seconds. In the attention subtest on the other hand the child is required to repeat growing sequences of digits. Both subtests demand memorisation and retention of auditive input for a short time. For solving the mathematical problem, to start with, two numbers have to be connected with the correct operator. The rest of this matter is determined by other cognitive abilities than attention, calculating abilities. This kind of problem-solving was possible for J. until the number of variables exceeded two. J.’s limits in short-term memory were four digits, he failed at repeating sequences of five digits and sequences of four digits backwards. For his age this represents a weak short-term-memory capacity for auditive input.

His visual attention span also turned out to be unsatisfactory. In examining the results in the procedure Figure of Rey (1959) we are able to understand better why. In this test the subject is required to first copy an abstract geometric figure and shortly afterwards to reproduce it from memory. J.’s ability to copy an abstract figure turned out to be average, i.e. his visual perception was normal. Free reproduction of this non-verbal test however clearly uncovered problems, the result was below average. It is striking how little time he took for copying and free reproduction, i.e. he was one of the fastest but in reproduction from memory one of the poorest drawers judged by the incompleteness of his free production. These results show that J. did not take enough time to figure out all the details thoroughly. Similar tendencies were observed in his reading. In Spanish and German reading aloud various word substitutions occurred, though his reading speed was not fast according to TALE (1990), a reading and writing test for Spanish. For example, reading a German text (66 words, 150 syllables) for first- and second formers out of the reader Borries & Tauscheck (2001) he produced four word substitutions and five inversions, such as *öffnen* (*to open*) instead of *Öfen* (*stoves*). J. either did not attend enough to input detail or his mental written lexicon was too vague, and as an insecure reader, J. was more intent on finishing his reading than on understanding what he was reading. The test situation probably increased his nervousness. When he was not able to recognise a word immediatlely, he produced substitutes. The errors he happened to produce suggest that he preferred word-based reading and did not use a reading strategy balanced between letter-by-letter- and whole-word reading as well as semantactic integration. Something made him hurry, he was overcome by

a feeling of insecurity. He lost his courage, when a task seemed to be too complicated. In his problems in verbal expression, at this stage, we have found the same tendency. He started in a hurry, got confused and finally took more time and the description was hardly understandable. One influencing factor probably was that he is the youngest of three children. He always tried to keep up with his older brother and sister and got used to hurry.

In the DRT[15] 2 (1997)-A result at the end of form two, J.'s writing skills were rated in some parts sufficient, in others poor, in comparison with his monolingual form-mates. It is striking that his exam marks in form two were better and in the beginning of form three were worse than the test predicted. Perhaps this difference reflects partly the difficulty in evaluating bilingual performance on the basis of monolingual standards. In general, at least verbal tests or their evaluation have to be calibrated for bilinguals. Statistical comparison with monolinguals to evaluate language achievement does not appear to be meaningful. Instead, I will focus on the error profile that is qualitative.

J. took DRT 3 (1997), the follow up to DRT 2, when he entered third grade at the age of 8 years and 4 months. DRT 3 is so demanding for a pupil of form three that the results show more clearly the extent of spelling problems. J.'s errors in DRT 3-A show that spelling rules were sometimes applied correctly, but not consistently. Occasionally errors on capitalisation and interferences, such as <chpeckt> instead of <Speck> (*bacon*), point to low attention during the test. Most of his errors in both word-dictation tasks are *t*-deletions (<schreib> instead of <schreibt> (*writes*), 7 items), t-additions (<chpekt>, 6 items) and substitutions of stop graphemes (<Sprachpuch> instead of <Sprachbuch> (*language book*), 10 items). While letter-sequence errors increased[16], substitutions of homorganic stops did not. These observations point to ...

- ... competence problems with stop discrimination. In 4.2. below we

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[15] DRT is a task, where 32 or more written sentences have to be completed. The child writes the missing word into the gap after the experimenter dictates it twice as a seperate word and once in the complete sentence. It is recommended to apply the test at the end of the form, or at the start of the following form, for example DRT 2 at the end of grade 2, or at the start of grade 3. DRT is standardised also for children with first languages different from German. But nothing is said about their competence in German, what the other language is, and other important parameters of bilinguality. Hence, it can be assumed that these standards are valid only for a minority of bilinguals.

[16] The degree of difficulty in DRT grows from word to word it is said in the test manual, but it is not very clear, how degree of difficulty is measured (error frequency ?). To me it seems that at least the part of phonemic-based orthography, where J. produced more errors, is not touched by this tendency.

analyse in detail, which distinctive features were not yet developed entirely.

- ... performance insecurities with the segmental sequence of words. These problems are analysed in detail below in 8.2., together with spelling data of our second and fourth participants.

4.2. Error analysis

In comparison with the other sixteen subjects between six and fifteen years, observed in this study, J. produced a considerable number of errors in stop spelling, 19 items in German and 5 items in Spanish. Table 4.1 shows all 24 stop-spelling errors, J. produced in test and available school dictations, school essays and drafts of the survey[17]. They are ordered according to systematic confusions:

(1) /d/ for /t/ preceded by voice, in Spanish. 4 of the 5 errors occurred in environments where /d/ and /t/ both are produced with oral closure (see 2.4.2. above).

(2) /b/, /d/, /g/ for /p/, /t/, /k/ preceding /r/, in German. In these environments aspiration of the stop is replaced by *r*-devoicing (see 2.4.2. above). 5 of the seven errors occurred in words with *kr*.

(3) Confusions in both directions, in German: /d/, /g/ for /t/, /k/ between sonorants[18], and /t/, /k/ for /d/, /g/ preceded by a voiceless obstruent.

(4) <p> instead of <b>, in German.

Table 4.1 also takes into account correctly spelled items of patterns (1) - (4).

[17] The sample consists of 1428 written words, 762 in German (380 at the end of grade 2 and in grade 3, and 382 in grade 4) and 666 in Spanish (272 at the end of grade 2 and in grade 3, and 394 in grade 4).

[18] A sonorant is a speech sound with syllable-nucleus potential, i.e. a vowel, nasal or liquid.

	correct	false
(1) In Spanish: /d/ for /t/ preceded by voice, mostly /nd/ for /nt/.	**grade 3 (8 items with <nt>)** dentista (*dentist*) interes (interés) (*interest*) orizonte (horizonte) (*horizon*) contraste (*contrast*) entonces (2 x) (*then*) pantalon (pantalón) (*trousers*) valientes (*brave*) contacto (*contact*) **grade 4 (all 10 items with <nt>)**	**grade 3 (5 items)** candarin (cantarín) (*vocalist*) durande (durante) (*during*) indenso (intenso) (*intense*) salian dodos (salían todos) (*all came out*) que dodabia (que todavía) (*that still*) **grade 4 (no errors)**
(2) In German: /b/, /d/, /g/ for /p/, /t/, /k/ preceding /r/, mostly /gr/ for /kr/.	**grade 3** <tr> - 8 items, such as <Truhe> (4 x) (*chest*) <kr> - no correct items **grade 4** <kr> - 2 items, <kriebbelt> (kribbelt) (*is crawly*) and <kranheit> (Krankheit) (*disease*). <tr>, <pr> - all, except 1 item. Example: <fertreiben> (vertreiben) (*drive out*).	**grade 3 (5 items)** (einen) granz (Kranz) (*corona*) (Katze) grazt (kratzt) (*scratches*) (Katze) greipt (krallt) (*claws*) ein grach (einen Krach) (*a noise*) ferdragen (vertragen) (*endure*) **grade 4 (2 items)** Kinder grigen (kriegen) (*bear children*) (Mutti) pesbrüt (besprüht) (*drizzles*) (permutation)
(3) In German: /d/, /g/ for /t/, /k/ between sonorants, and /t/, /k/ for /d/, /g/ preceded by a voiceless obstruent.	**grade 3 (all, except 4 items)** Example: /nkə/ - trinke (*drink*) **grade 4 (all, except 3 items)** Examples: <gl> - glüglich (glücklich) (*happy*), /ltə/ - brüllte (*hollered*)	**grade 3 (3 + 1 items)** sammelden (sammelten) (*collected* pl) tringe (trinke) (*drink*) (nonce) (Magen) gnurt (knurrt) (*grumbles*) hastu (hast du) (*have you ... ?*) **grade 4 (0 + 3 items)** ganz tregig (dreckig) (*dirty*) gemacht ist klüglich (nonce) (glücklich)(*happy*) scheußlich, toch zetzt (scheußlich, doch jetzt)(*awful,but now*)
(4) /p/ for /b/ in German.	**grade 3 (the majority with *b* in the onset)** Examples: blank (*clean*) blinckt (blinkt) (*sparkles*) zu beobachten (*to observe*) **grade 4 (all)**	**grade 3 (5 items)** Mutter packt (backt) (*bakes*) Kekse Sprachpuch (Sprachbuch) (*language book*) geprochen (gebrochen) (*vomited*) dapei (dabei) (*thereby*) wurde pehindert (behindert) (*hampered*) **grade 4 (no errors)**

Table 4.1: Distribution of spelling errors with stops and correctly spelled words with stops in a bilingual poor reader in grade 3 (contains data from the end of grade 2) and grade 4.

We recognise that type (1) and (2) problems concern the mentioned border zones, in which attention on one cardinal feature fails to be enough, in which minor features have to be taken into account, like refined phonetic nuances. J. overcame these problems at the end of grade 3. Ear training in the discrimination of stops in their phonotactic contexts in both languages, which J. received in grade 3, may have led to temporary confusions and hypercorrections.

J. occasionally failed to distinguish voiced from voiceless stops in certain positions. Most errors of type (4), such as <wurde pehindert>, or <dapei>, in which the stops' position is intervocalic, i.e. fully voiced, confirm this claim for German. We have seen in 2.4.2. that /b/, /d/ and /g/ are nearly always fully voiced in Spanish, but that they often undergo devoicing in German (*ich blei*[b]*e* (*I stay*), *du blei*[p]*st* (*you stay*)). Spanish-German bilinguals initially build one levelled system for the perception of "voice". In a phase of separating both systems one from the other, the voice feature might have been faded out temporarily by J.

The majority of J.'s stop-spelling errors (19 out of 24) coincide in the aspect that, when preceded by a sonorant, <d> and <g> substitute for <t> and <k> (all 14 items), when not, <p>, <t> and <k> substitute for <b>, <d> and <g>. In grade 4 this pattern is still valid for 4 out of 5 errors. Probably J. tended to rely on the voice marker of the preceding speech sound, for example when his stop discrimination failed. This tendency and the presence of three candidates of stop permutation in words, <tregig>, <pesprüt> and <klüglich>, are evidence for order phenomena, triggered by holistic processing.

So far, the discussed spelling problems of stops can be put down to phonetological underspecification of stops, when alphabetisation had begun. As was argued in 2.4.4. underspecified phonological representations in bilinguals can be considered as a transient phonological-awareness deficit compared to monolinguals, which in the worst case cause difficulties in certain areas of literacy acquisition. Before alphabetisation, J. had no reason for sharper discrimination. Suddenly, with literacy acquisition it became necessary to modify his internalised stop systems.

The following three factors may have had some accompanying impact on the insecurity in discriminating language-specific stop occurrences:

- Cognitive factors: Immaturity, short attention span, and problems in self-monitoring, i.e. auto-controlling attention, hamper acquisition processes, such as literacy acquisition, which require a high level of cognitive effort.
- Language-specific preference of stops: In the first year of the survey <p> and <g> are overrepresented in German (11 items, no counter-example)

and <d> in Spanish (5 items, no counter-example).

- Transfer: At an early stage of alphabetisation, aspiration of German stops can be interpreted as fricativisation of Spanish stops by Spanish dominant bilinguals, because of the acoustic-phonetic similarity of both features. The consequence could be temporary spelling confusion of German stops. Problems disappear, as soon as aspiration is reinterpreted and an aspiration feature is consolidated. Then, aspiration can only be confused with fricativisation in a state of tiredness, distraction or nervousness, such as in a dictation situation.

4.3. Conclusions

The following individual factors influenced J.'s alphabetisation process:

- More spelling errors showed up in German than in Spanish because of J.'s Spanish-dominant bilinguality.
- Attention deficits.
- Fast but incomplete problem solving, because of insecurity, due to transitions from a simple and unified rule system to two complicated and differentiated systems.

Conclusions (1) - (5) back the assumption that the boy's bilinguality had visible impact on transitional spelling insecurities of Spanish and German stops:

(1) Underspecification led to phoneme representations of stops, which were sufficient for oral speech, but not for writing purposes.
(2) Delayed development of phonetological minor features in both languages led to temporary confusion, in German in case of stops preceding /r/ and in Spanish in case of dentals after /n/.
(3) Fading-out of distinctive feature "voice" in German stops in a separation phase of the two phonological systems, was identified to be an additional bilingual factor with a potential impact on spelling accuracy.
(4) Holistic processing of oral speech served perception economy, but led to the tendency to spread phonological distinctive phonetic features of the preceding speech sound to the adjacent stop, maybe as a

phonetological reaction to the confusions with stop discrimination.

(5) An overreliance on word-based holistic reading and problems with analytic reading and writing strategies are visible in retrieval-carelessness errors and spelling problems concerning segments and their order. Phoneme-based orthography remained a bit weaker than more complex orthographic rules, such as consonant doubling, the spelling of devoiced obstruents in postvocalic position, or the redundancy principle of postvocalic <h> etc., which he seemed to internalise faster.

Conclusion (2) confirms our hypothesis that spelling problems in bilinguals can be caused by a delay in the acquisition of language-specific realisation rules rather than by differences between the phonological systems. The clear decrease of J.'s spelling errors of stops suggests that transitory bilingual delay phenomena can be overcome relatively fast. In J.'s case problem-designed ear training may have had some impact on the speed of this development. (4) and (5) show that precise, language specific phonological reception is an important parameter for spelling accuracy and that in a transitory phase, analytic processing may be underrepresented in alphabetisation in bilinguals, as hypothesised in 2.4.4. This point will be further analysed in 8.2. below.

We can draw the general conclusion that problems with voiced, devoiced and voiceless stops in Spanish-German bilinguals arise above all from the difficulty with the acquisition of two phonological systems. It is underspecification, which allows the child to construct a single economic underlying system for his two languages. Minor-rule gaps come clearly to light in literacy acquisition and spelling compels the child to refine his phonology so as to arrive at a norm-compatible phonographic system. Until then, in complicated phonetic sequences, attention is focused on the leading features and minor features are ignored. Most of these phonetology-based spelling problems disappear as soon as spelling becomes a matter of recognition and production of whole words, when spelling is based on the mental lexicon. J. is a good example for the claim that problems in literacy acquisition get visible sooner in bilinguals than in monolinguals (Critchley 1972, 17). The staff at bilingual schools should at least be aware of a possible appearance of bilingual transition phenomena and, at best, they should be taken into account in school practice (see 8.4.2. and 8.4.3. below).

5. Case study 2 – Shallow writing and retrieval carelessness

In case study 2 the analysis concentrates on the development in the written modalities between grade five and grade eight as well as the impact of a subsequent treatment, based on language comparison. As in case study 1, a striking number of spelling errors are explainable in terms of an overreliance on holistic processing, but in case study 2 at a more advanced alphabetisation stage. Secondly, the intrusion of an inadequate, i. e. shallow writing mode, more adequate in Spanish than in German, was found to have occasional impact on the transcription quality of German text production. In the conclusive part 8.2. below a closer look is taken at the connections between too early holistic processing in the alphabetisation process and its possible consequences at different stages of simultaneous alphabetisation in two languages. 8.3., again, illustrates that shallow writing and sublexical processing can be overcome relatively fast by a comparative intervention, focusing on the morphological principle of German orthography, while a comparative attempt to overcome part-of-speech insecurities did not lead to a comparable successful development.

5.1. Developmental and academic history

The second participant of this study, D., was observed for four years, from grade five onwards. D.'s mother is German, his father is Spanish. Since his birth, D. and his family have lived in Madrid. At the age of fourteen years he attended the eighth grade of secondary modern school at DSM, Deutsche Schule Madrid (German School Madrid). At this time he lived with his mother, a nursery-school teacher and his older sister. Before getting divorced the mother had been a housewife. The father, with whom the boy stays on weekends, holds a manager position in a department store. The boy spent a part of most holidays in Germany. He always had a strong exposure to both languages. In general, D. was an open-minded boy and helpful with his friends and school mates. He liked to talk in both languages, equally.

According to Hamers & Blanc (2000, 27) his bilinguality can be described as follows:

(1) Simultaneous childhood bilinguality: both languages are his mother tongues.

(2) Endogeneous bilinguality: a German community is present at home, in school and on holidays.
(3) Additive bilinguality: both, Spanish and German are valorised, a fact that favours cognitive advantage.
(4) Bicultural bilinguality: double membership and bicultural identity.
(5) Balanced bilinguality: oral competence in both first languages is strong.
(6) Partly compound bilinguality: Occasionally retrieval problems in both languages occurred, that also show up in synonym-retrieving tasks.

D.'s language acquisition was normal. He did not begin to speak late, and did not show pronunciation problems at any acquisition stage nor any delay in acquiring grammatical structures. At the age of four, his nursery-school teacher noticed that D.'s line drawings were somewhat awkward, and feared possible alphabetisation problems. At the age of ten a developmental dyslexia for German was diagnosed. Ratings were based on monolingual children. There is no case of developmental dyslexia described in D.'s family. But his mother reports that he did not express himself with the same ease as his sister did at the same age, in any of the two first languages. He got nervous easily and word-retrieving problems turned up in such moments.

5.1.1. Language background

At the end of grade 7/8 D. filled in the language-background scales. They show that at the age of thirteen he interacted in both languages only with his sister and his mother. In their conversations he seemed to lean a bit more on Spanish than the female family members. Although D. perceived few switches in his own talk, his mother reported that D. mixes much more than her daughter did.

With everybody else either German or Spanish were used. It seemed that D. preferred to use German, talking to girls at school. On the other hand, male talk with peers in Spain took place in Spanish only, even when language choice existed. German borrowings were used occasionally. There was a remarkable variety of styles in his use of German: As academic language with the German teachers, as peer-group language with his friends from Germany (near Cologne) and his German chat partners and as family language for various generations, including his grandparents and relatives in Germany.

By number of activities Spanish was dominant. Activities he preferred in

German are watching TV and listening to audio books in German. Praying, thinking in the German lesson and about Tolkien's "Lord of the Rings" are the other areas with preference for German. In his self-assessment he said that he calculated in German. But I observed that in mental arithmetic he switched to Spanish. On these occasions he became accustomed to name two-digit numbers in the Spanish order: To calculate in German, instead of *zweiundsiebzig* (*seventy-two*) he held the number string *sieben zwei* (*seven two*) in his articulatory loop. In grade 7/8 D. read two German and two Spanish books for school, two other German books in his spare time he never finished. He also read one Spanish book and Spanish car and sports journals. Although he said that he did not like reading and writing, he spent some hours daily on the internet for pleasure reading and chatting, more in Spanish than in German.

5.1.2. Performance in school

At the end of form four, D. still obtained average marks, but in dictations his performance was poor in both languages, and he tended more and more to reject reading and writing tasks. Motivating him to do his homework got more and more complicated. He expressed great lack of enthusiasm to read books, even when their content interested him much.
In grade five DSM drops dictations as a type of German exam. Unfortunately, his performance got worse in nearly all school subjects during the second half of form five. He constantly forgot to do his homework, paid less attention to the teachers' instructions, chatting in class with his mates[19]. Fragmentary sentences and missing text structuring characterised his essays in German and decreased their intelligibility.

From form seven on, D. has attended secondary modern school and step by step his marks in German and Spanish climbed again from adequate to satisfactory. Pupils of DSM secondary received German and Spanish classes separately from grammar-school pupils, and all other subjects together with them. In the first half of form eight, D. worked hard to improve his participation in his weakest subjects, mathematics and physics. His marks in German improved, but still teacher criticism worried him enough and one could rattle him easily. His hypersensitivity caused him visible muscular tension. Sometimes, he forgot unpleasent but necessary activities,

[19] The divorce of his parents is probably one reason why the boy's engagement in school declined.

like doing homework, putting in order his school satchel, asking for some information, etc. In those cases, D. tried to justify these forgotten activities with circumstancial factors like: the teacher changed the classroom, a class mate did not remind him, etc. To some extent, failure could be due to easy distractability, but repression probably is another influencing factor. On the other hand, his self-confidence was great enough, to be nominated for the position of form prefect when he entered form eight.

One of the main features in his essays at the end of the survey was the clear structure of the text, raising intelligibility and access to the content. Only now and then, word deletions or word additions and deletions of grammatical suffixes occurred. Even though his vocabulary for verbs was quite ample, he regularely repeated content verbs in the same text in this phase. His type-token ratio in German exams increased for short essays but not for long ones, comparing the last two survey periods (grades 6/7 and 7/8), i.e. he already applied a larger vocabulary variety, under certain circumstances. D. was able to produce very few spelling mistakes in his exams, but as his essays grew in length and scope the number of spelling errors grew disproportionately towards the end.

5.1.3. Performance in psychometric procedures

Because of his orthography problems in school, D.'s parents sent him to a speech therapist at the age of nine years for the first time. The diagnostic results for Spanish turned out to be in lower average position. One year later his German reading and writing competence was diagnosed as dyslexic. At the same time his intelligence skills were rated above average by the CFT 20 intelligence-test battery (CFT 1998). His visual perception at the age of thirteen, measured with the "Figure of Rey" test (description, see 4.1.2. above), turned out to be about average. The free reproduction of the same figure points to a normal capacity of visual short-term memory. The time he took to draw was also on average. However, his drawing strategy was characteristic for an age of about ten years, signifying a three-year delay in perceptual organisation.

The boy had a good memory for telephone numbers and auditive short-time memory was also satisfactory, as well as his arithmetic thinking. The last two skills were measured at age 13;9 (thirteen years and nine months), applying the HAWIK (1999) subtests for attention span and mathematical problem solving (description, see 4.1.2. above). In the attention-span task, having to repeat strings of numbers

reversely, D. first repeated the given string (in forward direction) to remember it better. This auditive strategy is slower than remembering the digit string visually. It also illustrates that the boy solved the problem with much care and attention. D.'s limits in this short-term memory task were sequences of eight digits (and sequences of six digits backwards), which is considerable (most written words contain less than seven letters).

D. read fluently with an adequate intonation. Compared with monolingual German six graders, he read aloud with average speed, whereas his fluency decreased with time from average towards slightly below average. Reading errors concerned grammatical endings, chiefly. The reading-fluency data was assessed, applying ZLT (2003). His reading comprehension, again compared with monolingual German six graders, turned out to be above average, measured with ZLVT (2002). However, he needed much more time, 39 minutes instead of the mean value of 21 minutes, hesitating within the decision process.

He passed DRT 4 (2003)-A with three mistakes out of the 42 test items, a result, which differs considerably from the high number of spelling errors in most of the survey exams. Thus, D.'s writing performance leads to the conclusion that many of his mistakes were lapses and not caused by a lack of competence but by insecurities in performance. We have to take a closer look at their quality, bearing in mind that his visual and auditive perception and his visual and auditive memory were not disturbed. His memory capacities were sufficient for a normal acquisition and retrieving of word images. Especially his results in reading and writing tests do not tally with his spelling results in the majority of his school essays.

5.2. Error analysis

D.'s orthographic errors in German school exams were collected over a period of three years. To allow comparisons between grades, the number for misspelled words was converted into percent values, for each grade and for each error class. The resulting frequency values represent the proportion between the error-token number and the total number of written words within the respective period. The number of D.'s reocurring errors increased in the last year of the survey, while the type frequency of errors decreased. Table 5.1 shows the distribution of the exam errors within a period of three and a half years.

	Grade 5/6	Grade 6/7	Grade 7/8	8th grade 2nd half (rough book[20])	Example
Total frequency, token (type)	9,9 (9,2)	9,7 (8,7)	9,2 (7,7)	about 30	
Phonology	2,2	2,1	1,1	2,9	*ensetzt* instead of *entsetzt*
Consonant-doubling	1,3	2,2	1,9	4	*Gespennst* instead of *Gespenst* (*ghost*)
Capitalisation	2,7 (33 % derivations)	3,3 (42 % derivations)	2,9 (63 % derivations)	3,2 (only abstract nouns were counted)	*ihrem lächeln* instead of *ihrem Lächeln* (*her smile*)
Graphemic ambiguity	2,6 (75 % pseudo-homophones)	1 (29 % pseudo-homophones)	2 (50 % pseudo-homophones)	1,8 (61 % pseudo-homophones)	*dier* instead of *dir* (*you* dative)

Table 5.1: Frequency and distribution of spelling errors of a bilingual poor reader, produced in German essays and a draft between grade five and grade eight. The frequency values record the percentage of misspelled word tokens in proportion to the total number of written words in the respective period. Values of umlaut and solid/open mistakes are not listed.

Orthographic correctness turns out to have more weight in school-exam writing than in rough-book writing, as the overall-percentage comparison of mistakes in table 5.1 shows. The dramatic difference in orthographic correctness between draft writing and exam writing illustrates that self-monitoring in D.'s text production is sensitive to the writing situation and the writing tools (pen versus keyboard)[21]. In the more tense exam situation, spelling control turns out to be more satisfactory, whereas the rough book was produced without recourse to orthographic rules. The four major classes of orthographic deviations in table 5.1, phonology, consonant doubling,

[20] While the exams were handwritten, the rough book was typed. It was produced as an orientation for an oral school report. The text includes 1473 words, produced in about six hours spread over four days. The vocabulary of the text is poor, its intelligibility low (like in grade 5/6) and D. produced a striking number of grammatical mistakes, such as regularization of irregular verbs in past tense (*verlierte* instead of *verlor* (*lost*), *erratete* instead of *erriet* (*guessed*)).

[21] About 70 % of the nouns in the rough book were typed in lower case. Many of them may be caused by the simple obstacle that producing a capital letter on the keyboard requires pressing two keys at the same time. Yet, not all capitalization errors are due to keyboard mechanics, as the distribution of nouns with upper case suggests. The majority of correctly spelled nouns in the draft text were proper names, followed by some concrete nouns. Abstract nouns virtually always were produced in lower case.

capitalisation and graphemic ambiguity, are described in the following subsections.

Table 5.1 also contains the categories “derivations” and “pseudohomophony”, which look at errors from a psycholinguistic perspective. While purely segmental misspellings decreased in careful writing, one observes an increase of semantic similarity and pseudohomophony between attempt and target. This shift may reflect a growing inventory of complex orthographic representations. Furthermore, it underlines that slips of the pen tend to lead to (wrong) words rather than non-words (word superiority effect), analogous to slips of the tongue (Levelt 1991, 355).

5.2.1. Phonology

Phonology errors are elisions, substitutions, additions, permutations and displacements of letters and letter sequences. The overall proportion of these misspellings was halved from grade 6/7 to grade 7/8.

Many phonology errors are due to one of the following phenomena:

- Lexical confusions and pronunciation insecurity of infrequent words, such as in <Umfals> instead of <Unfalls> (*accident* genitive). D. repeatedly replaced the derivational morpheme *un-* by the particle *um*, as found in *umfallen* (*to tumble*). Another example is the attempt <Augenbraun> (*the brown of the eye*), which does not make much sense in the target context <Augenbrauen> (*eyebrows*). Possibly, D. did not know the infrequent morpheme *Brauen* (*brows*) and relied on the spelling of a more familiar near-homophone in his mental lexicon.
- Coarticulation phenomena: Word-medial, or final consonant clusters are prone to change by deletion or substitution of a homorganic consonant. Nearly always, the place of inaccuracy is the last consonant position preceding a syllable boundary, often coinciding with a morpheme boundary, such as <ensetzt> instead of <entsetzt> (*ent#setzt* (*horrified*)).
- Letter omissions, or substitutions, due to spoken (dialect) variants of a word. Examples are the repeated error <grad> instead of <gerade> (*just*) and <rutschich> instead of <rutschig> (*slippery*) where the spelling corresponds to standard pronunciation, but violates the morphological principle of German graphotaxis.

These phenomena account for 38 % (grade 5/6), 64 % (6/7) and 73 % of D.’s

phonology-based errors, all in all 28 out of 56 error types. So three factors, producing spelling errors, could be slightly delayed phonological, morphonological and graphotactic accuracy. In case study 1, quite similarly, we found delayed phonetological minor-rule development, to be an important factor for alphabetisation problems.

Turning to performance errors, throughout the survey only three phonology-based errors can be attributed to language contact. An example is <igal> instead of <egal> (*never mind*) with the Spanish translation *igual*. D. produced a striking number of execution slips in grade 5/6 (41 %), as well as in the rough book. Execution-carelessness slips, such as superfluous word repetition (e.g. <kann kann>) or letter omissions in frequent, easy-spelled words (e.g. <sen> instead of <sein> (*be*)) disappeared in grades 6/7 and 7/8. The remaining errors concern the following occasional letter displacements in words and characteristic letter additions:

- Syllable assimilations, i.e. consecutive syllables, which are made to look/sound alike (5 items), such as <mindensten> instead of <mindestens> (*at least*), or <Umgegun> instead of <Umgebung> (*environment*). These cases could also be described as perseverations.
- Anticipations or inversions of letters and letter strings (1 item): The nonce mistake <Sadner> instead of <Sander> (German surname) may be due to an insecure analysis of the sequence.
- <t>-additions in characteristic contexts (2 items), such as <plötztlich> (nonce mistake) instead of <plötzlich> (*suddenly*). These errors are no isolated cases. J. and other primary-school pupils of our sample produced various instances of them in DRT (see 4.1.2. above), and occasionally in essays or dictations. We can assume that discrimination of [t] or its position in postnuclear obstruent clusters was not ensured.
- Occasional blends (1 item), <berhandelt> (nonce mistake) instead of <behandelt> (*treats*, contextual distractor: *Beer*, dutch first name, a character of a story). This substitution of a word part is explainable in terms of retrieval carelessness, phonetic similarity of German *be* and *ber*, and morphological insecurity with the word-formation prefix *be-*.

  The following three examples concern umlaut in German word-formation[22]. D.'s spellings represent his deviant pronunciation prompted

[22] According to norms of standard German some adjectives in *-ig* show umlaut, others don't: *Tat* (*action*) - *tätig* (*active*), *Bruch* (*rupture*) - *brüchig* (*fragile*); *Abart* (*anomaly*) - *abartig* (*abnormal*), *Rauch* (*smoke*) - *rauchig* (*smoky*). The system allows ± umlaut. The norm selects one form or differentiates two adjectival meanings: *Last* (*load*) - (*gleich-*)*lastig* ((*equally*) *loaded*) /

by misleading analogies:
<blaufärbig> instead of <blaufarbig>/<blau gefärbt> (*blue-coloured*/*dyed in blue*), <knöchig> (nonce mistake) instead of <knochig>/<knöchern> (*bony*). Both errors may be norm errors, analogous to a word-formation pattern productive in *brüchig* (*fragile*) from *Bruch* (*rupture*).
<Gehirnerschuttung> instead of <Gehirnerschütterung> (*concussion*) with the substitute *Schutt* (*waste*). This error may be due to lexical confusion and pronunciation insecurity of infrequent words (see above). In the moment, he produced the blend, he paid no attention to the target spelling, which was printed in the instruction to compose an accident report.

These errors are probably due to competing analogies in the lexicon or distraction in the text, favoured by insufficient double-checking, especially lack of phonemic control in the transcription process, as well as in the rereading process. Despite the clear decrease of phonological errors at the end of the survey, which could indicate a sharpened phonological control for writing purposes, phonemic-control errors were observed until the end of the survey.

In sum, the analysis of D.'s phonology errors provides evidence for slightly delayed graphotactical and morphonological development. Secondly, phonemic-control errors may point to a holistic strategy, used in the alphabetisation of bilinguals, a point, taken up again in section 5.2.4. Grapheme ambiguity - Sublexical processing and retrieval carelessness.

5.2.2. Consonant doubling

In German, a vowel grapheme followed by two consonant graphemes within the same morpheme is normally pronounced lax and short (<Lust> (*lust*), <Kante> (*edge*) ...). If followed by a doubled consonant grapheme, without morpheme boundary between the doubled consonant letters, the vowel is always pronounced lax and short (<Schall> (*sound*), <Schatten> (*shadow*)). According to Luelsdorff & Eyland (1991, 81) this non-segmental principle forms one of the difficult obstacles in orthography acquisition in German. Consonant-doubling errors either are doubling of a single consonant (addition) or singling of a doubled consonant (elision). They occur in two graphotactic contexts, one, followed by a word boundary or vowel (such as <kliken> instead of <klicken> (*to click*)), and the

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lästig (*troublesome*).

second, followed by a morpheme boundary and additional morphemes with initial consonants (such as <glüklich> instead of <glücklich> (*happy*)). Table 5.2 shows D.'s singling errors in both graphotactic contexts:

Singling error followed by ...	Grade 5/6	Grade 6/7	Grade 7/8
... a vowel or a word boundary.	koregierst / korrigierst (*correct*) helen / hellen (*bright*) Welen / Wellen (*waves*) kan (nonce) / kann (*can*) Glük (nonce) / Glück (*luck*) wen (2 x) / wenn (*if*, *when*) den (2 x) / denn (*because*)	komen / kommen (*come*) kliken / klicken (*click*) Retungsschwimmer (nonce) / Rettungsschw. (*lifeguard*) wen den (4 x)	wil (nonce) / will (*wants*) wen den
... a morpheme boundary and additional morphemes with initial consonants.	mänliches / männliches (*male* neuter) Schifsjunge (nonce) / Schiffsjunge (*shipboy*)	fält / fällt (*falls*) herlich / herrlich (*marvellous*) umbewust / unbewusst (*unconsciously*) verwirt / verwirrt (*baffled*) glüklich / glücklich (*happy*) (ein) bischen / bisschen (*a bit*)	glüklichen / glücklichen (*happy*) sizt (nonce) / sitzt (*sits*) beschmükt (nonce) / geschmückt (*decorated*) verbrantes / verbranntes (*burnt*) Umfals / Unfalls (*accident*, genitive) bischen (4 x)

Table 5.2: Singling errors produced by a bilingual poor reader in essays between grade 5 and grade 8.

While an error like <kliken> violates patterns of grapheme-phoneme correspondences[23], an error like <glüklich> does not, if the morpheme boundary *glück#lich* is overlooked. These cases violate rules of morphonological consistency or invariance and show a lack of morphonological awareness. D. produced nearly the same number of singling errors under each of these structural conditions. The error pattern <VCV> instead of <VCCV> disappeared in grade 7/8, elisions in the

[23] German orthography has many exceptions of high token frequency:<das> (*the* neuter, nominative/accusative), <in>, <der> (*the* masculine, nominative), <es> (*it*), <von> (*from*), <mit> (*with*), <hat> (*has*), <des> (*of the* masculine/neuter), <man> (*one* pronoun), <an> (*at*, *on*), to mention the most frequent ones.

<VCC#C> context remained. Within the class of phonology errors the morpheme-boundary-preceding position also was quite error-prone (see 5.2.1. above).

Altogether, the corresponding data in table 5.1 above indicates a 14 % decrease of consonant-doubling errors in the last two years of the survey. Table 5.3, again, compares the frequency of doubling and singling errors, produced by D. in the last two years of the survey, with the one, produced by monolingual peers.

	D., grade 6/7, 11;8 - 12;7 years	D., grade 7/8, 12;8 - 13;7 years	Monolinguals, 12 years
Doubling	3,23 (2,86)	7,06 (8,91)	2,76
Singling	17,74 (20)	10,59 (11,88)	5,83
∑	20,97 (22,86)	17,65 (20,79)	8,59

Table 5.3: Doubling-error comparison between a poor bilingual reader and a sample of monolinguals reported by Luelsdorff & Eyland (1991, 79). The values represent the frequency (in %, token frequency is given in parenthesis) of doubling errors within the total amount of errors.

Although D.'s problems with consonant doubling decreased slightly at the end of the survey, they still were twice as often the source of spelling errors compared with younger monolinguals.

D. produced 19 tokens (14 types) of superfluous consonant doubling, seven in grade 5/6, two in grade 6/7, and nine in grade 7/8. They follow a short or a long vowel. The short-vowel cases are:

- Pseudohomophones (4 items), such as <Gespennst> (nonce mistake) instead of <Gespenst> (*ghost*), or <schencken> for <schenken> (*give (a present)*), rather arise from a false lexical or sublexical analogy. They are explainable in terms of an overgeneralisation of the domain-specific doubling rule.
- Doubling due to spoken variants or pronunciation (3 types, all in grade 7/8): In <interresant> instead of <interessant> (*interesting*), the vowel-preceding [R] is produced lax, hence the spelling <rr>. D., like many of his peers, pronounced the onset of the last syllable with a [z] (see 7.2. below). <Mottorad> (nonce mistake) instead of <Motorrad> (*motorbike*) where the Spanish cognate *moto* probably was activated, follows a similar stress pattern: emphasis of the antepenultimate. <Will> (4 tokens) instead of <Wil> (a character in

a story) is pronounced like *will* (*wants*), and spelling impact of this frequent verb can be assumed.

The long-vowel cases (<Haffen> instead of <Hafen> (*habour*), etc.) nearly all occurred in the first year of the survey (7 out of 9 items), possibly because the length distinction of German vowels (see 2.4.1. above) was still insecure.

The increase of the boy's superfluous doubling on the one hand suggests a deeper orthographic processing at the end of the survey, but simultaneously confirms that the domain of the consonant-doubling rule was not completely consolidated yet. Possible explanations, such as the influence of text length and the striking proportion of consonant-doubling mistakes, especially in rough-book writing, in spite of their slight decrease in exams, are discussed below.

5.2.3. Capitalisation

At the age of twelve, capitalisation errors account for 25,38 % of all spelling errors of a sample of German school children (Luelsdorff & Eyland 1991, 79). For D. this percentage is slightly more than 30 % at the age of thirteen years. This difference is notable but not as striking as the one in consonant doubling (see above). In grade 6/7 and 7/8 the majority of repeated errors within the same exam concern capitalisation. The fact of initial lower case in Spanish nouns may have had some influence in D.'s writing performance in German. In grade 7/8, lower-case slips in German-English cognates (e.g. <jeans>) grew as a cross-linguistic effect. Altogether, 27 % of all nouns written in lower case concern items with English cognates. Nominalisations, such as <ihrem lächeln> instead of <ihrem Lächeln> (*her smile*), account for about 40 % of all lower-case nouns in grades 5/6 and 6/7, and 50 % in grade 7/8. More evidence for part-of-speech insecurity can be found in grade 7/8 where 71 % of the capitalised lower cases are adjectives derived from concrete nouns[24]. Within the same period, lower case in concrete nouns almost disappeared. In the rough book only 30 % of the nouns are capitalised, mainly proper names. Lately, compound nouns next to English cognates emerged as a new factor for lower case in nouns, not increasing their total amount, comparing the last two measuring periods. The overall decrease of capitalisation errors in the last two years of the survey is negligible (see table 5.1 above), but must be seen as a result of individual steps forward and new

[24] such as <ein Strahlender ausdruck> instead of <ein strahlender Ausdruck> (*a wonderful expression*). The adjectiv is a derivation of the noun *Strahl* (*ray*).

difficulties.

Non-concreteness of nouns and polysemy with verbs and adjectives are important sources of error. At the end of the survey, derivations, starting with an adjective, verb or with a preposition, and also English cognates have a neutralising impact, too. Concreteness seems to have an activating influence on capitalisation. We can assume that D. had problems to recognise substantives in sentences, especially when they were not marked by any derivational morpheme.

The error data does not suggest any influence of the preceding word in a phrase. Determiners, pronouns, adjectives and prepositions precede D.'s "decapitalised" nouns with equal frequency. As far as can be deduced from his error data, either the school-teaching advice "nouns are preceded by an article" has had no visible impact on D.'s writing performance, or the neutralisation factors mentioned above produced stronger impact than the activation factor "preceding determiner", shown in school. The latter explanation would suggest that, in D.'s case, syntagmatic information suffered underexposure in comparison to isolated semantic features of the lexical entry, with regard to capitalisation. Obviously, D. had no command of nominalisation and adjectivisation rules. About one third of all capitalisation mistakes in grade 6/7 and grade 7/8 occurred in NPs containing adjectives. These NPs prevailingly were not in grammatical subject position. In the described domain, D. was unable to analyse the phrase structure (Det-) Adj-N correctly. One influencing factor for this insecurity could be the unmarked Spanish word order Det-N-Adj:

die (Det) deutschen (Adj) Sachen (N) (*German things*) = las (Det) cosas (N) alemanas (Adj)
deutsche Sachen = cosas alemanas

Additionally, some of the noun-adjective insecurity in German may be caused by the fact that in copula constructions in German the noun is difficult to distinguish from an adjective, because it is not preceded by a determiner, as in Spanish:

Es tut mir leid (Adj). (*I am sorry*) = Lo siento.
Es ist Schmutz (N). (*It is dirt*) = Es una porquería.
Es ist schmutzig (Adj) (*It is dirty*) = Es sucio
Wer ist schuld ? (Adj) (*Who bears the blame ?*) = ¿ Quien es culpable ?
Wer hat Schuld ? (N) (*Who is to blame ?*) = ¿ Quien tiene la culpa ?

Only after the additional procedure of inserting a determiner, it can be decided unequivocally, if the word is an adjective or a noun (*Wer hat die Schuld ?* but **Wer ist die schuld ?*). Additionally, rare cases exist, in which the translation of an adjective in German is a noun in Spanish (Das ist schade (A). (*It's a pity*) = Es una lastima). Another possible cause for capitalisation insecurity are lexicalised verb constructions with nouns and adjectives, such as *Ich gehe heim / nach Hause / nachhause* (*I'm going home*), or *Ich fahre Rad* (*I ride a bike*), *Rad fahrende / radfahrende Kinder* (*bike-riding children*), *ich sehe fern* (*I watch TV*, containing the adjective *fern* (*far*)). In some examples, (actual) orthographic norms allow two constructions, solid with lower case or open with the noun in upper case[25]. These norms illustrate the variety of orthographic possibilities.

In sum, in isolated presented words, D. was able to determine the corresponding part-of-speech correctly. But in context part-of-speech recognition became too involved, and his awareness for the parts-of-speech remained insecure. It can be argued that his performance on capitalisation still lacked system adequacy. The frequent appearance of conversion and polysemy errors, where D. tended to rely on lexical and not on syntactical features, is further evidence for this assumption. Word-order differences between Spanish and German[26] and attention decrease towards the end of the sentence may have caused noun and adjective insecurity to a certain extent. Despite a 17,9 % decrease in capitalisation errors, which contributed to a slightly augmented spelling accuracy in grade 7/8, the error analysis provides clear evidence for the boy's retardation in acquiring German capitalisation rules and their domains. The number of (parts-of-speech-) conversion mistakes at the end of the error observation still was as large as it was at the beginning.

5.2.4. Grapheme ambiguity - Sublexical processing and retrieval carelessness

Errors grouped under the label "grapheme ambiguity" comprise cases where one sound in German corresponds to various graphemes. For example, the sound [k] has four different and context-dependent spellings, <ch>, <g>, <k> and <ck> (Luelsdorff & Eyland 1991, 71). The fact that "German orthography is much more consistent in grapheme-phoneme direction than in the converse direction" (Wimmer et al. 2000, 678) leads to a quantity of possible orthographic spellings, which are pronounced identically or similarly. Indeed, German spelling is based on a morphological principle, and therefore, writing, mediated through sound or other

25 See Duden (2006), § 34 (2.1.) and (3), or § 36 (2.1.).

26 We already observed order difficulties with German two-digit numbers (see 5.1.1. above).

sublexical entities is likely to lead to mistakes, more so than in Spanish. Hence, grapheme-ambiguity errors can give insights into which processing mode was preferred.

Sublexical retrieval of frequent rhymes and other sublexical letter strings:
In grade 5/6 28 out of 40 grapheme-ambiguity errors are pseudohomophones, in grade 6/7 (only) 2 out of 6, and in grade 7/8 8 out of 20. The high number of pseudohomophones (such as <Halz> instead of <Hals> (*neck*), <sterckere> instead of <stärkere> (*stronger*), etc.) indicate strong reliance on sublexical processing. Most errors based on pseudohomophones follow a characteristic pattern: the initial consonant or consonants (syllable onset) are spelled correctly, with the remaining letter sequence (such as the syllable rhyme) looking like a frequent pattern of German graphotaxis. To examine this impression, I compared the frequency of the erroneous rhymes with the frequency of the target rhymes. The rhyme frequency was examined via the CELEX database[27] and the impression was confirmed. The erroneous but possible orthographic rhymes tend to occur in many lexemes and thus tend to be of a higher type frequency than the target rhymes. D.'s deviant spellings contain more productive sublexical orthographic units for derivational processes than the target spellings. Finally, token frequency seemed to have had less influence on the boy's spelling than the type frequency and productivity factors. The following example illustrates these frequency observations.

Lapse: <dier> instead of <dir> (*you* dative)
Type frequency <-ier>: 6 (*hier*, *vier*, *Tier*, *Bier*, *(Neu-)Gier*, *Stier*)
Type frequency <-ir> : 3 (*wir*, *mir*, *dir*)
<-ier>-types are components of hundreds of compound words. Besides, <-ier> is a productive component in hundreds of verb paradigms (*verlieren*, *kopieren*, *summieren* ...) and many two-syllable nouns (*Klavier*, *Turnier* ...). Although <-ir>-types are of high token frequency, they never occur in compounds. Neither is <-ir> a productive sublexical orthographic unit. It exclusively appears in a handfull of words (*irgend*, *virtuell*, *Vampir*, *irdisch* ...). Graphotactically, *ir* is mostly followed by a consonant grapheme (*Schirm*, *Kirche*, *Wirbel* ...).

Pseudohomophonic misspellings may spring from overgeneralising regular patterns and sublexical encoding at the expense of direct retrieval. The analytic

[27] The CELEX corpus contains 10000 wordforms from German newspapers with at least one occurrence per million in their frequency order. The database was collected by the Centre for lexical information, Max-Planck-Institut, Nijmegen, The Netherlands.

strategy used to circumvent lexical gaps can occasionally lead to errors. But such errors are a sign of active learning strategies.

Retrieval carelessness:
D. produced fewer lexical than sublexical grapheme-ambiguity errors, one in grade 5/6, four and seven in grades 6/7 and 7/8. We find four potential cognates, such as <Bush> instead of <Busch>, four substitutions of word parts (see table 5.4 below) and three homophones, such as <viel> (*much*) instead of <fiel> (*fell*), and finally two neighbors, i.e. phonologically similar but not identical expressions without content similarity (such as <bist> (*are* second person singular) instead of <Biest> (*beast*)).

D.'s spelling	Correct spelling	Substitute
<Unter**ihr**dischen>	<unterirdischen> (*underground*, adjective)	ihr = her
<**voll**genden>	<folgenden> (*following*)	voll = full
<ge**stall**tet>	<gestaltet> (*arranged*)	Stall = stable
<her**vor**derung>	<Herausforderung> (*challenge*)	vor = before hervor = out

Table 5.4: Substitutions of parts of words, in which lexical morphemes replace content-less syllables (the bold-typed substitutes replaced contentless syllables), produced by a poor bilingual reader in essays between grade 6 and grade 8.

Such errors can be the result of blends (for this notion Levelt 1991, 215 f), because they are composed of two words. These blends are examples of retrieval carelessness and may reflect a "narrowed" retrieval mode where a special case of superimposition of similar forms takes place. This mode becomes possible because in the case of less familiar words lexical look-up may (have to) rely on chunking, entailing the possibility of chunking errors. The blends in question produce orthographic (homophone superimposition) or even phonological (neighbor superimposition) deviations from the target word. Both lead to semantic neologisms. Wordform blends are further analysed in 7.4.1. below.

Altogether in grade 7/8 fourteen spelling-error types (nine of them are nonce mistakes), six in grade 6/7 and three in grade 5/6, are probably due to retrieval

carelessness. Most retrieval-carelessness errors (twenty items), and all segmental-order errors (eight items, four in grade 5/6, three in grade 6/7 and one in grade 7/8) have in common that they deviate from target pronunciation. It is likely that they are the result of the same underlying problem, connected with analytic processing and control.

Another group of retrieval-carelessness errors, regularly observable in D.'s texts, can be exemplified by *suchen nach* + acc (correct is *suchen nach* (*look for*) + dat) instead of *achten auf* (*look after*) + acc, when he did not change the content of the sentence but replaced the target verb in the transcription process. Here lexical confusions lead to grammatical or syntactic slips instead of spelling mistakes. D. replaced the target by a structurally similar phraseal unit, without carrying out the necessary grammatical feature spreading. Lexical-look-up errors increased in D.'s essays while lower-level spelling errors decreased throughout the survey. Probably, this shift means somewhat advanced cognitive writing mechanisms, suggesting stronger lexical involvement. This involvement sometimes occurred in the transcription phase, which was no longer under control of higher linguistic levels, such as syntax or semantics. Blends, homophones and neighbors are signs of insufficient reliance on semantics.

Most of the present grapheme-ambiguity errors illustrate that sound identity or sound similarity between linguistic units bigger than phonemes or graphemes, but smaller than the target word itself, primed D.'s orthographic performance negatively. We also observe a tendency of more lexical retrieval and less sublexical retrieval in grade 6/7. The reincrease of sublexical errors in grade-7/8 essays is explainable in terms of a less successful suppression of a sublexical strategy for writing purposes.

5.3. Discussion

The large number of errors in D.'s essays is due to a delay in alphabetisation by comparison with his monolingual and bilingual peers. The results of the spelling-error analysis of a three-years survey give the following insights into his alphabetisation development:

(1) A strong reliance on the spoken language manifests itself in errors, triggered by coarticulation phenomena (<Ohring> instead of <Ohrring> (*ear-ring*), etc.) and by spoken variants (<rutschich> instead of <rutschig> (*slippery*), etc.).
(2) A lack of morphological control in D.'s writing shows up in the high number of consonant-doubling errors, especially singling in <VCC#C>, assimilation (<umbewust> instead of <unbewusst> (*unconsciously*), etc.) and elision (<ensetzt> instead of <entsetzt> (*horrified*), etc.).
(3) Reliance on frequent sublexical orthographic patterns was erratic; exessively in grade 5/6, decreasingly in grade 6/7 but slightly increasing again in the third survey year.
(4) Lexical look-up and transcription lead to slips of the pen, such as substitutions of near-homophones or changes in the letter sequence. There was insufficient segmental control, both in the transcription and rereading process. Retrieval-carelessness errors increased in this group of errors.
(5) The distinction between nouns and adjectives seemed to remain unclear for D., especially in sentence context. This may have to do with the different word order in Spanish and German nominal phrases. In his last exam papers he tended to apply a false simplification, namely lower case for non-concreteness and upper case for concreteness.

D.'s retardation in alphabetisation can be explained by factors concerning all bilinguals as well as individual factors:

1. A temporary overload due to the need of acquiring two languages and their orthographic word representations with approximately half the exposure to each language compared to a monolingual. Thus, minor rules or sharpened domain-adequate application of a rule as well as a more refined vocabulary may be acquired with a delay. Delayed differentiation amounts to a levelling of distinctive features.
2. Levelling of differences in orthographic writing principles in two languages may lead to problems with simultaneous alphabetisation (see 5.3.1. below). Holistic strategies can impede the acquisition of minor rules.
3. Another main cause for retardation in alphabetisation is little exposure to written language. Too little practice with all written contexts of a word and underexposure to prototypical returning letter sequences delay the development of the orthographic lexicon and the use of the direct pathway to semantics in reading via the automatised retrieval mechanisms for sight vocabulary.
4. Weak monitoring is a further factor retarding literacy development.
5. Hypercorrection may lead to overinclusive errors of type (2) (<berhandelt>, etc.) and (3) (<dier>, etc.).

In the following sections we will discuss error patterns due to bilinguality, to other factors, or to a mixture of these.

5.3.1. L 1 influence and impact of bilingual strategies

At the end of the survey, D. already mastered the consonant-doubling rule, but within CC#C he failed regularly. Indeed his writing followed the system rule "a short-vowel grapheme has to be followed by two consonantic graphemes". But at the same time his spellings violate the morphological principle in the German writing system. It can be argued, that he had not yet acquired the morphemic dimension of the consonant-doubling rule entirely. Two crucial differences between

Spanish and German may have had their impact on this delay: There is no short/long distinction in the Spanish vowel system and doubled consonants are rare in Spanish orthography, except for <ll> and <rr>, which correspond to separate phonemes. As long as the systematic representation of vowel length/tenseness in the German spelling system is not acquired, the child has to rely on available sight vocabulary and on sublexical grapheme strings, and, as long as the consonant-doubling rule is not consolidated, the child must rely on a shallow writing mode, just as in D.'s case. This reliance on shallow writing is a temporary phenomenon in the development of German orthography. In D.'s case the shallow writing mode was also strengthened by the Spanish spelling system. D. tended to write as he speaks, applying phoneme-grapheme correspondences throughout systematically, as coarticulation phenomena and transcriptions of spoken variants show. In Spanish orthography more pronunciation changes, such as assimilations (*imborrable* (*unforgettable*), etc.), also lead to changes in the orthography. Additionally, changes in orthography are possible without pronunciation changes (*po*[k]*o* and *po*[k]*ito* but <poco> and <poquito> (*a little* and *a bit*), etc.). Preserving pronunciation, or pronunciation changes in orthographic representations is an important principle in Spanish orthography, while the German reader/writer must learn to disregard such changes, and instead, rely heavily on orthographic representations of lexical entries (see 2.4.3. above) and morphological constants (*u*[m]*bewusst* but <unbewusst> (*unconsciously*), *richti*[ç] but <richtig> (*correctly*), etc.). Shallow writing in German is best visible in D.'s draft writing, where his selective attention is mainly focused on pragmatic and semantic aspects but not on form and where he writes spontaneously. The draft is characterised by shallow spelling, as if he is falling back on already acquired processing habits: The consonant-doubling rule is violated more often, compared to any exam since grade 5, and he produced most of his nonce mistakes where a Spanish near-homophone replaced a German word (*dar* (Spanish *give*) instead of *da* (German *there*), etc.). His language-background scales indicate that his preferred language for internet chats was Spanish, and the observed interference phenomena in draft writing suggest that his general German writing habits were clearly influenced by his general Spanish writing habits, especially in informal contexts.

Levelling provides an alternative interpretation of interference phenomena. Distinctions, relevant only in one of the two languages, tend to be learned late, e.g. vowel length in German and its orthographic representations. What at one stage is a competence deficit, may at a later stage turn up as an interference phenomenon. D.'s difficulties with upper case are another case in point, because NP-word-order

differences between Spanish and German possibly cause some trouble in recognising parts-of-speech within the sentence context. In Spanish the head word normally follows the article, and in German D. occasionally capitalised the adjective, as in <die Zweite Amtsprache> instead of <die zweite Amtssprache> (*the second official language*).

In section 2.4.4. it was argued that underspecified perception may cause letter exchanges at an early stage of alphabetisation in bilinguals. Errors of type (4) (<hervorderung> instead of <Herausforderung> (*challenge*), <plötztlich> instead of <plötzlich> (*suddenly*), etc.) suggest that for D. these difficulties still were present in grade 7/8. In section 8.2. below bilingual and monolingual data is compared to provide more evidence for the claim that bilinguals rather than monolinguals experience temporary problems of analytic processing in alphabetisation and written-language use. In section 2.4.4. it was also claimed that holistic processing may support writing by analogy, a strategy, which can complicate minor-rule acquisition. D.'s type-(2) errors (<ensteht> instead of <entsteht> (*arises*), etc.), linked to morphonological as well as morphological awareness deficits, were the result of applying false analogies. Thus, they may be interpreted as evidence for impact of holistic strategies in simultaneous alphabetisation of bilinguals. Finally, type-(3) errors, which indicate reliance on frequent sublexical letter sequences, may be the result of gaps in the vocabulary of written words. Delays in the building of an inventory of complex orthographic representations is a difficulty, which again can be associated with underspecified perception, present at early stages of bilingual language acquisition.

5.3.2. Influence of variable monitoring capacities on writing performance

Monitoring can be described as a process of controling the correctness of language performance using any kind of knowledge, consciously and unconsciously (Ellis 1996, 179, 268). We can monitor an utterance on different linguistic levels, on the vocabulary, grammar and discourse level etc. In writing, the two major areas of attention are composition and transcription (Smith 1982, 19 f). While composition concerns all linguistic aspects from the idea to the formulation[28], transcription concerns correct spelling, punctuation and neatness (loc. cit., 20). In addition, the monitor has a temporary role in supervising the application of newly learned rules.

[28] Ehlers (2006, 123 - 5) describes a number of such inference types, which application are important for the quality of the composition, respectively for the intelligibility of texts.

The monitor may be thought of as an internalised teacher giving advice such as "Don't forget...; Now remember...". This enables learners to correct and change productive habits.

Krashen (1986) thinks that too much conscious monitoring[29] in conversational situations is bad for the learner (loc. cit., 2), but good in writing and prepared speech (loc. cit., 76). Our data confirm the latter assumption. Occasionally D.'s writing is more monitored than in others. As the comparison between draft and essay writing shows, for D. the use of the monitor was good. In his written exams under speed-test conditions, it appears that planning contributed to an increase in text coherence and intelligibility. Yet his monitor capacities varied between the two extremes of hypercorrection and superficial attention on what he is doing. We observe hypercorrection when he spends more time and care than necessary on problem solving or when he applies superfluous orthographic rules, or lexical look-ups, like in blends. The fact that in various essays he produced comparatively more grapheme-ambiguity lapses than in draft writing suggests that hypercorrection impeded him from retrieving already existing word images. On the other hand, the number of self-corrections in grade 5/6 is visible evidence of effective monitoring on transcription. In contrast, as a result of weak monitoring, in draft writing 70 % upper cases and 80 % commas are missing. From his language scales we have already derived that on various occasions his self-observations are not ensured at all: While he perceived few switches talking with his mother or sister, his mother reports much mixing. He asserted that he does not like reading and writing, but spent some hours every day on the internet for pleasure reading and chatting. He thought, he carried out arithmetic calculations in German, although it was visible that he relied heavily on Spanish. These observations are no examples of monitoring, as defined above, but they already show that his attention quality is conspicious. And, at least conscious monitoring, too, strongly depends upon the direction and quality of his attention.

While his spelling visibly advanced in grade 5/6 and grade 6/7, his essays regularly lacked in certain aspects of composition, like text structuring and intelligibility. Obviously, his monitoring was concerned more with transcription then with composition. As a result of a writing-strategy change[30], in grade 7/8 the sentences were more complete and the text structure clearer, without increasing the number of orthographic errors, but with an error-profile change, namely a reincrease

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[29] Krashen (1986, 1 f, 101) hypothesises that two monitors exist, of which one only utilises conscious, learned knowledge.

[30] In accordance with Smith (1982) D. was instructed to first compose and then transcribe, first formulating the idea, memorising the formulation and writing it down word by word.

of errors, explainable in terms of sublexical processing, which may be interpreted as a fallback on a beginner strategy, productive until the end of grade 5/6. Secondly, in general, long essays contain a higher percentage of consonant-doubling mistakes in consonant clusters than short ones, a tendency that partly may be due to monitoring. Under certain circumstances, in this case a text length of more than 300 words, the care on morphological consistency in words with geminates was not as accurate as in texts with less than 200 words. Faster writing probably evokes a shallower transcription, visible in an increased amount of consonant-doubling errors in consonant clusters, found in drafts, in grades 6/7 and 7/8 but not in grade 5/6, where the amount of consonant-doubling mistakes was very small. Again we can argue that at school his monitoring was highly focused on this aspect of German orthography, while the amount of fragmental sentences within this period confirm a lack of monitoring on composition.

Krashen (1986, 100) hypothesises that high anxiety, low self-esteem and low motivation affect the acquisition process negatively. These parameters may have had their impact on D.'s alphabetisation progress, limiting his monitor skills. As was described in 5.1.3., he got nervous easily, suffered fear more physically than other children and hesitated within the decision process. Sometimes, his insecurity perhaps produced the negative side effect of reliance on routines of an anterior stage of alphabetisation. On other occasions it provoked hypercorrection. In consequence, these mechanisms could have delayed the formation of orthographic word images in the mental lexicon and the automatisation of their retrieval. It can be argued that variable monitoring capacities may have led to a retardation of the alphabetisation process as well as to a temporal fallback on inadequate transcription strategies. It can be concluded that the monitor quality was an important influencing factor for D.'s writing accuracy and alphabetisation development. When he cared more about transcription, the content and the textual coherence in writing was poor (grade 5/6 and 6/7). To all appearance, monitor overload was compensated via shallow writing, regularly. The overload may have been due to the way of monitoring. If it was serial, i. e. first phonological correctness and afterwards morphological correctness was monitored, it can be argued that this filter probably was too complex. The possibility that D. applied such a serial filter, could suggest the absence of automatised simultaneous holistic and analytic strategies in the transcription process.

5.3.3. Influence of surface dyslexia

In linguistic research on developmental dyslexia three subtypes are described, phonological dyslexia, surface dyslexia and naming-speed dyslexia. Individuals with phonological dyslexia suffer difficulties in phonological awareness, like phoneme discrimination or phoneme identification. Wimmer et al. (2000) assume as possible causes for a phonological impairment "... less sharp phoneme boundaries ... or ... less distinct phonological word representations" (loc. cit., 668). A surface dyslexic suffers an impairment in building-up visual word representations. She/He mediates reading or writing via phonology. The naming-speed subtype is characterised by slow naming of objects and slow reading of words. This impairment is supposed to be located at the association level between phonology and visual representations (loc. cit., 678).

According to Wimmer (1993, 23 f) in pseudoword naming in German, the three subtypes should manifest themselves differently:

- A naming-speed dyslectic is expected to perform slowly but quite accurately, without producing real-word responses.
- The surface dyslexic's performance is expected to be fast and accurate.
- The phonologic dyslexic's reading will be slow and poor with reading refusals.

As usual in the field of speech pathology, different impairments may co-occur. A surface dyslexia can occur combined with a phonological dyslexia. Compared to normal readers, all subtypes of dyslexia seem to share the symptom of prolonged activation times for phonological word representations. Children with reading disabilities often experience difficulties in rapid automatised naming (RAN). It takes them significantly longer to name or to point at named common objects, digits, letters or color patches. This tendency was first shown by Denckla & Rudel (1976), and for German dyslexics this difficulty is described in Landerl (2003, 23). Finally, delayed progress from letter-to-letter to sight processing is reported as a dyslexic symptom (Wimmer (1993, 25) and Harm & Seidenberg (1999, 526)). As possible core reasons for dyslexic problems, phonetic deficits as well as automatisation or generalisation deficits and narrowed accessibility of phonological word representations are taken into account.
Little research has been done on bilingual dyslexics (Peers 2001, 191) and to my

knowledge none has been done investigating written texts. In the few studies referring to bilingual dyslexics, the combination of writing systems is the main focus (Critchley 1972, 16 ff). Dyslexics with a logographic or syllabographic and an alphabetic writing system show different levels of difficulty in both. Karanth (1992, 301) reports a case of a ten-year old boy, biliterate in English and Hindi (phonetic syllable script), who experiences more problems in English, especially with homonymy and near homonymy. In Hindi the main problems occur with keen sound differences and similar looking syllabographs.

By and large, we recognise some of the mentioned dyslexia problems in D.'s German, if we disregard his bilinguality: He did not like reading very much, he gave the impression of slow word retrieval and alphabetisation progress was delayed. Coarticulation- and false-pronunciation errors indicate the existence of slight phonological discrimination difficulties, sublexical processing may be due to the impairment of building up visual word representations. The observed overreliance on phonology may be attributed to the compensation of retarded visual organisation capacities, as in surface dyslexia. The over-use of phonology-based reading and writing is mentioned as a crucial symptom of surface dyslexia and interpreted as compensation (Harm & Seidenberg 1999, 505). The amount of misspellings provides quantitative evidence for a dyslexic disorder that was diagnosed in German but not in Spanish. In my view a monolingual analysis is misguided.

We have already mentioned the stronger reliance of the Spanish writing system on phonology and its levelling force in bilinguals as a possible influencing factor, retarding the application of morphological spelling principles in German. In addition, some of D.'s pronunciations may vary from standard due to his slight westphalian dialect and his preference for colloquial speech. And if we take a closer look, his difficulties in expressing himself with ease in both languages point to word retrieval problems in speaking as well as in writing, which are not characterised as described in RAN-experiments. They are more similar to the tip-of-the-tongue phenomenon, i.e. a blockade to access well known wordforms. The tip-of-the-tounge state can be primed with a similar sounding word (neighbor) (Levelt 1991, 320). To a great deal these kind of retrieving problems maybe caused by affective variables, as mentioned above. The clear decrease of phonologically motivated errors, as well as the presence of erratic sublexical processing in grade 7/8 (but not in grade 6/7) is consistent with this analysis. As described above, impaired phonological mechanisms are inherent in all dyslexic subtypes, and a drastic decrease of phonology errors in such a short time span at this age would not be likely to occur. Therefore we argue that D.'s case is above all one of developmental delay, not of

dyslexic disorder. Word-retrieving problems showed up when he is getting nervous, and in non-monitored writing he falls back on beginner strategies, or does not rely sufficiently on phonemic control. Maybe a small portion of phonological impairment accompanied the boy's trouble with literacy development. But the fact that so much monitoring on transcription still was necessary at the end of the survey also points to problems with the automatisation of a balanced double-checking process. The added error analysis in 8.2. below deals with possible underlying patterns causing this deficit.

5.4. Conclusions

As we have seen, D.'s alphabetisation development was retarded and guided/conducted school alphabetisation was not as helpful to prevent a literacy retardation. In some domains delays up to three years in his perceptual organisation were discovered and for memorising purposes he applied an auditive strategy instead of the faster strategy of remembering visually. Because of this difficulty he relied too much on spoken language in writing. Overreliance on phonology, which was supported by a writing strategy of memorising spoken phrases, combined with mixed retrieval strategies made an accurate word access and a proper inhibition of competitors within the mental lexicon more difficult. Hence, only when his writing was highly monitored, could he detect or prevent errors. Otherwise, shallow writing was one major source of errors, and other factors evoked retrieval-carelessness errors. The growing lexical involvement within the error sample and the decrease of pure segmental deviations underline that the boy's acquisition and retrieval of orthographic representations was becoming more adequate and that a shallow writing strategy interfered less and less in German.
Clear evidence for further bilingual impact, such as levelling phenomena and delays due to simplification, was provided. System errors on capitalisation indicate that the language-specific part-of-speech rules within sentences were not yet acquired. Despite little reading practice, step by step his orthography got independent from spoken language. Nevertheless at the end of the survey, D. had not reached a state where reading becomes independent of spoken language, which is supposed to be the final reading stage to be acquired by children (Obler & Gjerlow 1999, 110). Retrieval carelessness, execution carelessness or the slower and more error-prone sublexical processing, of which one or two were present all throughout the survey, were due to overloaded or disturbed monitoring capacities. An insufficiently

automatised and imbalanced double-checking device is likely to be a major cause of this monitoring overload. The question whether and how these problems are linked with bilingual strategies, will be further analysed separately in 8.2. below. 8.3. focuses on therapy decisions, and in 8.4. possible school-educational consequences are discussed.

6. Case study 3 – Levelling phenomena in a consecutive bilingual without orthography problems

In J.'s and D.'s case studies we became acquainted with a constellation, in which the alphabetisation was retarded. Evidence was provided for the possible role of bilingual factors in this process. In the present case study a participant without orthography problems is presented. Nevertheless, persisting grammar violations manifested themselves in his written German but not in his written Spanish. It will be argued that certain sociolinguistic factors of bilinguality possibly had a positive impact on alphabetisation, while an early speech-perception delay due to insufficient exposure to German hampered the development of certain grammatical aspects before and during alphabetisation. Monitoring in the composition phase of writing can be proposed as a helpful method to treat habitualised false patterns and to prevent fossilisation.

6.1. Developmental and academic history

The third participant of this study, E., was observed from grade five until grade nine. At the end of the survey he was fifteen and attended the grammar-school at DSM, Deutsche Schule Madrid (German School Madrid). He lived with his parents and his two-years older sister. His mother was a housewife and his father an agent of an animal-food company, offering the products to farms all over Spain. Since his birth, E. and his family have lived in Madrid. E.'s sister also attended DSM, but the parents, both Spanish, were not proficient in German. They sent their children to DSM to acquire a second language for their own benefit and because DSM has a good reputation for educating pupils adequately for further university studies. After school-leaving examination, E., a tidy, sporty and practically thinking boy, aspired to study sport and eventually business management at university. First and foremost, he learned German for his professional future, i.e. for utiliarian motives. Although he was not very interested in literature, he read, because it could be helpful for his marks in school. According to Mackey (1987, 703) E.'s bilinguality can be described as instrumental bilinguality. As we will see, E. was quite successful in acquiring a proficiency in the "school" variety of German, which served as a basis for reading and writing purposes.

As all participants in this study, with three years E. went to a German kindergarten in Madrid. Afterwards he attended pre-school at DSM. Exposure to

German therefore can be assumed from three years onwards. E. visited Germany three times, staying with a Spanish-German speaking couple with three children, with whom he mostly talked in Spanish. According to Hamers & Blanc (2000, 27) his bilinguality can be described as follows:

(1) Consecutive childhood bilinguality: Language acquisition commenced in Spanish. Since the age of three more and more German followed. After age eleven, in grade 5/6 he started to learn EFL (English as a foreign language) in school. Since the dominant first language is cognitively differently anchored in comparison with L 2 and L 3, more mutual influence between German and English is likely than between Spanish and English.
(2) Endogeneous bilinguality: A German community is present at school.
(3) Additive bilinguality: Both Spanish and German are socially valorised, a fact that favours cognitive advantage.
(4) Monocultural bilinguality: E's cultural identity, membership and environment is Spanish, for example, the use of German is limited to the school class.
(5) Dominant bilinguality: His proficiency in Spanish was greater. At the age of fifteen his German had a superior level. Many borrowings from Spanish to German occurred in informal conversations.
(6) Rather compound bilinguality: Each language has a definite function, which can mean that cognitive units, i.e. notions, which exclusively build part of his "Spanish life", rarely are expressed in German and vice versa.

6.1.1. Language background

E. was dominant in Spanish. According to his own estimate at the age of fourteen, German was rarely spoken with friends and in the family context. With his sister he talked in German, only when the children did not want the parents to understand what they are talking about. Nearly all of the conversations outside the school lessons were in Spanish. Nevertheless, some of E.'s thinking activity was carried out in German. In his self-assessment he said that he calculated in German and that during German lessons he thought as much in German as in Spanish. In weekly training sessions, concerned with E.'s grammatical insecurities in German, as well as with compositional aspects of text production, we both nearly exclusively talked

in German.

For ordinary activities like shopping, telephone calls, watching TV etc., Spanish was the language of choice. Although he liked chatting on the internet, he rarely did so, not having enough time. Altogether he spent two hours per week on this activity, nearly always in Spanish. He asserted that in his spare time he only would read Spanish books and sport journals. However in the first year of the survey (grade 5/6) he also read German books in his spare time.

At fourteen E. described his mixing habits as follows: When he adressed a class-mate in school, it was always in Spanish. Only if his communication partner switched to German, E. also would. Communication situations with both languages in competition rarely arose. The clear separation of the two languages helped to avoid switching. During the survey E. only borrowed words from Spanish when they were not available to him in German. He used to convert Spanish word stems, mostly verbs, into German, adapting their pronunciation and providing them with the corresponding grammatical affix. In the spoken example *Er hat sich wie ein Erwachsener komportiert ... behalten ... benommen* (*He acted like an adult*) he made use of this part of his bilingual competence, employing the productive verb-formation morpheme *-ieren*. The example also shows that lexical retrieval in the dominant language even proceeded, when the other language was used and its corresponding lexical entry was available. In *Ich brauche eine Piste* (*I need a hint*), E. borrowed a word from Spanish, and made use of the productive rule that in German, female nouns tend to end in *-e*[31]. In contrast to D., E. was aware of using L1 forms in the L2 mode as a strategy to compensate for lexical gaps in German.

6.1.2. Performance in school and in psychometric procedures

Throughout the survey E. mostly obtained satisfactory results in all school subjects. Contents of Spanish and German language lessons at school barely interested him, nevertheless he participated satisfactorily. In general, his German and Spanish essays were short and their content was somewhat superficial. This impression was due to the tendency to repeat vocabulary, arguments (such as one general point of view) and argumentative structures.

Turning to the quality of visual perception, E.'s copy of the abstract geometrical "Figure of Rey"[32] turned out to be better in completeness compared

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31 Borrowings go beyond the scope of Weinreichs type C (translation) (see 2.1.3. above).

32 For a more detailed description of the test see 4.1.2.

with the average of his age-mates and it was on average for the time he needed to draw it. This means the boy's visual perception is good. E.'s free reproduction of the memorised figure even clearly topped average values for both parameters, spent time and completeness. The results illustrate a good, respectively very good visual memory for abstract forms. His visual capacities were encouraged by a safe timing ability, i.e. E. did not hurry to perceive and memorise, and afterwards he was very fast in reproducing the memorised image. Similarly, in general E. took enough time to plan the structure of his essays before writing the text, and in contrast to D., he found enough time afterwards for carrying out self-corrections.

In the last year of the survey E. read fast and fluently in German. From time to time he produced word anticipations, but he always self-corrected them. In Spanish he even read faster than in German and word repetitions predominated as reading insecurities.

6.2. Transcription process - Spelling errors

In his exams E. produced less than 1 % orthography errors and since grade eight he practically did not produce any. The largest amount of orthographic errors concerned consonant doubling with about one third (10 items), of which 7 items are incorrect doublings and only 3 are singlings of geminates. Less frequent were capitalisation errors (6 items) and letter elisions due to execution carelessness (5 items), such as <zerbrich> for <zerbricht> (*breaks*), or <Forsetzung> for <Fortsetzung> (*continuation*). E. did did produce only one retrieval-carelessness error. Candidates of holistic processing are *t*-additions <stürtzten> for <stürzten> (*plunged*), the false self-correction <stürtzte> and <man weißt> (*one knows*). But the *stürzte*-items and superfluous gemination in <insgesammt> for <insgesamt> (*all in all*) rather arose from momentary building of false sublexical analogies with frequent patterns of German graphotaxis, such as D.'s errors <schencken>, <dier>, etc. (see 5.2.2. and 5.2.4.).

The assumption that E.'s spelling errors by and large were due to performance phenomena is supported by the fact that many of them occurred in familiar words (<un> for <und> (*and*), <Jugen> for <Jungen> (*boys*), etc.), or were nonce mistakes (<Dirrektor> for <Direktor> (*headmaster*), <Gespent> for <Gespenst> (*ghost*), etc.).

One striking observation in E.'s sample of misspelled words is, that his error distribution differs from the one of German monolinguals. German monolinguals in

grade five rather produce consonant singling after short vowels than incorrect consonant doubling and they tend to fail in capitalisation of abstract nouns rather than with geminates, as an error distribution in the manual of a diagnostic orthography test illustrates (see tables in DRT 4 (2003, 71 ff))[33]. E., on the other hand, produced more gemination errors than capitalisation errors and more doublings than singlings. One explanation for the relatively high proportion of slips on geminates in E.'s error sample may have been a levelled-out short/long distinction in the German vowel system at an early stage of alphabetisation. In 5.3.1. we have argued that, what at one stage was a levelling problem (competence phenomenon), may at a later stage turn up as an interference, i.e. a performance phenomenon.

E.'s pronunciation, as the one of many of the seventeen subjects of our observation sample, suggests problems with the /s/ - /z/ distinction in German, which does not exist in Spanish. Before we enter into E.'s problems, first, the equidistant [s] - [z] constellation in Spanish and German is described. In Spanish, [z] is a rare allophon of /s/, for example in [azma] (*asthma*) (Hidalgo & Quilis 2004, 113), or *fresno* (*ash*), caused by regressive assimilation by the following voiced consonant. In German /z/ itself is a phoneme, which contrasts with /s/ in inter-vocalic position, for example in the minimal pair *wei*/*z*/*e* - *wei*/*s*/*e* (*wise* - *white*). The opposition never occurs word-initially, the best position to discriminate phonetical distinctions. Because of its limited distribution, the /z/-/s/ opposition is not very frequent, and we only find about 20 minimal pairs[34]. Contexts rarely exist, in which the distinction /z/ - /s/ carries a functional load, as in *der wei*[z/s]*e Mann* (*the wise/white man*). The distinction /z/ - /s/ is nonetheless important for orthographic accuracy in German. The phoneme-grapheme correspondences for /s/ and /z/ in postvocalic position are as follows: Preceded by a long vowel or diphthong, /z/ corresponds to <s> (<weise> (*wise*)) and /s/ with <ß> (<weiße> (*white*)).

E. already violated the phonological rules. In his pronunciation [z] and [s] were treated as complementary distributed. He chose [z], when preceded by a long vowel or diphthong (for example *au*[z]*erdem* instead of *au*[s]*erdem* (*in addition*)), and [s], when preceded by a short vowel. In the pronunciation of *Fri*[s]*ör* instead of *Fri*[z]*ör* (*hairdresser*) he additionally mistook a narrow for a short, lax vowel. Thus,

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33 The values are: No errors in consonant singling corresponds with percentage ranking (PR) 77,5, no errors in abstract nouns corresponds with PR 98. Indeed, the authors admit that in their data standard deviations are quite broad (DRT 4 (2003, 70)).

34 The number of the /z/-/s/ -minimal pairs is based on my own count in the CELEX-word frequency list, whose design is described in footnote 27. Diachronically, the /z/ - /s/ opposition is due to the substitution of /s/ for /t/, limited to the postvocalic position.

E. perceived and produced the difference between [s] and [z], but handled it in idiosyncratic ways. Due to limited exposure to German in early childhood the boy acquired the two sounds as if they were allophones of one and the same phoneme, just like in Spanish (equivalence classification, see 2.4. and 2.4.1. above). However, in written texts the described inaccuracies in phonotaxis and phonetics nearly are not visible. For example the boy only produced two errors with the spelling of words containing <ß>, <auserdem> instead of <außerdem>[35] (see above) and <weist> instead of <weißt> ((*you*) *know*). This is worth mentioning, because difficulty with <ß> is a phenomenon very common with German monolinguals, even in secondary school (DRT 5 (2004, 49)). The fact that E.'s underspecified phonological system of German (lack of a fricative phoneme) did not affect his spelling accuracy, may have been due to the preference to directly retrieve orthographic representations of words, without or with little reliance on phonology. An early building of such a retrieval mode, again, may have been favoured by two factors:

- Consecutive bilinguality: We can assume that E.'s German vocabulary before alphabetisation was relatively small, compared with monolinguals and also with simultaneous, balanced bilinguals. In school he learned a great deal of German vocabulary simultaneously in its spoken and written form. For this newly acquired vocabulary the accuracy in orthography is not influenced as strongly by word pronunciation, as for already existing phonological lexical entries.
- Visual strategies were especially successful in E.'s alphabetisation, because of his (very) good visual perception and memory (see 6.1.2.), and thus were preferred in literacy acquisition and reading and writing performance.

Both factors reduce the danger that underspecified phonological representations, or underspecified perception show up as spelling insecurities.

Finally, E. produced 5 errors, which may have been due to insecurities with stress patterns of more or less unfamiliar German words:

- The pronunciation of *Frisör* (see above).
- In German, double consonants are used after short but stressed vowels. In three cases E. misapplied the rule to short but unstressed

[35] This slip shows that, when he relied on pronunciation habits, this lead to occasional difficulties with <ß>.

vowels: <Dirrektor> (see above), <kapput> for <kaputt> (*broken*), and <herraus> for <heraus> (*out*).
- Singling in <Alergie> for <Allergie> (*allergy*) could be a simple spelling transfer of the Spanish cognate *alergia*, with or without transfer of the stress pattern.

All in all, the profile of E.'s spelling-error sample suggests the presence of slight system deficits of his German phonology:

- Levelling of short/long distinction of German vowels at an early stage of alphabetisation.
- Levelling of German *s*-phonemes.
- Insecurities with German word stress.

6.3. Compositional problems of writing - Errors in grammatical case in German

The grammar of E's written essays was much worse than his orthography. E.'s problems manifested themselves as gender insecurities, errors with case in nominal phrases, confusion with the correct use of prepositions and their case government, as well as valency insecurities and false conjugation. Particle verbs and prefix verbs also appeared to be difficult to acquire and apply for E. (*behalten* (*to keep sthg*) instead of *erhalten* (*to get sthg*), *sprechen* (*to speak*) instead of *ansprechen* (*to adress someone*)). Word-order problems, for example with compound verbs, also emerged (<...kann man viele Leute kennenlernen. Man kennt ihnen lernen...> instead of *Man lernt sie kennen...* (*You're going to know them...*)).This description is far from complete, but it offers a sketch of E.'s grammatical and syntactical problems. Table 6.1 shows, how many spelling errors and grammatical errors E. produced in German exams in four measuring periods:

Grade	Written words	Spelling errors	Errors in grammatical case	Other grammatical errors
5/6	983	13	11	48
6/7	367	8	13	15
7/8	819	8	21	21
8/9	850	2	14	11

Table 6.1: Number of spelling errors and grammatical errors in German essays, produced by an early, consecutive Spanish-German bilingual.

While in the first year of the survey only 20 % of all grammatical errors concerned case assignment, in the last year of the survey about 55 % of all grammatical errors concerned case assignment. Table 6.1 illustrates that neither spelling errors, nor other grammatical errors were as persisting as grammatical-case errors. To get insights into the quality of underlying problems, grammatical-case errors are analysed in more detail. In the following typology, errors are ordered according to the major error sources "Overgeneralisation of the nominative", "Overgeneralisation of the accusative", "Confusion with the dative case" and "Difficulties with adjective inflexion". Well-formed occurrences were also taken into account in the error analysis, as E. applied grammatical case more often correctly than erroneously in his exams, which suggests that grammatical case rules were familiar to the boy.

6.3.1. Overgeneralisation of the nominative

Overgeneralising the nominative is a beginner strategy in the acquisition of the case system. E.'s error data contain ten unambiguous examples where a nominative was substituted for another case. The correct form is given in parenthesis:

grade 5/6

(1) <zu sein (seinem) Steuermann> (*to his helmsman*)

(2) <zu Herr (Herrn) H.> (*to Mr. H.*)

(3) <zu mein (meinem) bester (besten) Freund> (*to my best friend*)

(4) <F. hat J., sein (seinen) Hund, ...> (*F. has J., his dog*)

grade 6/7

- [36]

[36] The data base of grade 6/7 was reduced (see table 6.2 above).

grade 7/8

(5) <ein (einen) Platz in der Schule verdienen> (*deserve a place in school*)

(6) <erzählt über ein (einen) normaler (normalen) Tag> (*tells about a normal day*)

(7) <Ich beschreibe M., ein (einen) amerikanischer (amerikanischen) Mann, ...> (*I describe M., an American man, ...*)

(8) <hält sein (seinen) Mund zu> (*keeps his mouth close*)

(9) <ich würde sein (seinen) Bart als...bezeichnen> (*I would refer to his beard as ...*)

grade 8/9

(10) <weil die Geschichte ein (einen) offener (offenen) Anfang und ein offenes Ende hat> (*because the story has an open start and an open end*)

With one exception these errors only occurred until the end of grade 7/8, in prepositional groups only until the end of grade 5/6. In this grade neither *zu meinem*/*seinem*/*einem*, nor **zu meinen*/*seinen*/*einen* occurred[37]. A factor for the substitution of the nominative for the accusative may be the fact that in feminine and neuter a NGr in nominative and in accusative show no difference in German. As a consequence of system pressure, this simplification was transferred to the inflectional paradigm of masculine determiners and adjectives. For the reverse strategy, i.e. adding inflexional endings to feminine or neuter accusative, we can not provide evidence from the pool of E.'s errors on grammatical case. Except in (2), overgeneralisations of the nominative concerned the inflexion paradigm of *ein* (*a*), *mein* (*my*) and *sein* (*his* / *its*, possessive pronoun) where the forms are phonetologically very similar. As items (11), (16), (20), (22), (31) and (42) below show, E. did not always reduce forms of *ein*, *mein* and *sein*[38].

6.3.2. Overgeneralisation of the accusative

Overgeneralising the accusative is an advanced strategy in the acquisition of the case system. E.'s error data contain 20 examples (16 in prepositional phrases) where an accusative was substituted for a dative and only one example where an accusative

[37] Throughout the survey, the only occurrence of such a construction was *zu seinem Haus* in item (42) below.

[38] Five out of six of these items are from grades 7/8 and 8/9, none from grade 5/6.

was substituted for a nominative (item (11)):

grade 8/9

(11) <da einen (ein) Mitschüler sie mit ... erpresst> (*because a classmate blackmails her with ...*)

Overgeneralisation of the accusative after dative prepositions:

grade 5/6

(12) <aus die (der) Klasse> (*out of class*)

grade 6/7

(13) <nach Madrid, seine (seiner) Stadt> (*to Madrid, his city*)

grade 7/8

(14) <bis zu den (dem) Becken) (*to the pelvis*)

grade 8/9

(15) <zu eine (einer) Art> (*to a kind of*)

(16) <von D.K., einen (einem) Mitschüler> (*by D.K., a class mate*)

Here, occasional overgeneralisation may have been promoted by further syntactical factors. In (13), (14), (15) we possibly deal with violations of the norm constraint that the accusative is restricted to the group of variable prepositions (see below), when direction is expressed. Possibly this constraint was not yet accessible for E. Indeed items (13) and (15) can also be interpreted as nominative overgeneralisations.

Dative or accusative were levelled out in appositions (items (4), (7), (13) and (16)). In the whole survey E. did not produce appositions correctly in the masculine accusative, or in the masculine/neuter/feminine dative. Syncretisms in the German case system are further complicated by the distinction between strong and weak declension of adjectives: In grade 7/8 E. wrote item (17), <mit direkten Blick>, where standard German requires either *mit einem direkten Blick* or *mit direktem Blick* (*with a straight look*).

Overgeneralisation of the accusative after prepositions with variable case:

grade 5/6

(18) <wohne in die (der) Burg> (*live in the castle*)

(19) <steht hinter die (den) Mauerzinnen> (*is behind the wall battlements*)

grade 6/7

(20) <kam ... in einen (einem) Rettungshubschrauber> (*came... in an emergency helicopter*)

(21) <An diesen (diesem) Tag war ...> (*on this day was ...*)

grade 7/8

(22) <hat einen Schaden an das (dem) rechte (rechten) vordere (vorderen) Licht> (*has a damage on the right front light*)

(23) <in diesen (diesem) Raum ... steht ein Tisch> (*in this room ... is a table*)

(24) <unter die (den) Augenbrauen blicken seine hellbraune(n) und kleine(n) Augen.> (*under the eyebrows his light-brown and little eyes glance*)

grade 8/9

(25) <er will nicht der beste (Beste) in alles (allem) sein> (*he doesn't want to be the best in everything*)

(26) <vor das (dem) Gehen zu ... > (*before going to ...*, nominalised infinitive)

(27) < ... ist in erste (erster) Person geschrieben> (*... is written in the first person*)

Errors after prepositions with variable case mostly concern the class of definite article words (seven items out of ten). Altogether E. produced thirteen errors after prepositions with variable case. Ten times he substituted an accusative for a dative and three times he substituted a dative for an accusative (see 6.3.3. below, items (33), (34), (36)).

Accusative endings with verbs requiring a dative complement:

grade 5/6

-

grade 6/7

-

grade 7/8

(28) <verleiht ~~ihm~~ ihn (ihm) ein teuflisches Aussehen> (*makes him look like a devil*) (wrong self-correction)

grade 8/9

(29) <A.F. entscheidet sie (ihr) zu helfen> (*A.F. decides to help her*)

(30) <ich musste jemanden (jemandem) sagen, dass ... > (*I had to tell sbdy that ...*) (nonce mistake)

(31) <... habe ich sie (ihr) einen Kuss gegeben> (... *I have given her a kiss*)

In E.'s essays dative complements had the correct dative ending 14 times. Three out of four errors occurred in the last year of the survey and concern the system of pronouns. It is quite possible that a more advanced phrase structuring provoked the rare performance failures on dative-governing verbs in (29) - (31). At least on the surface the verb was not yet available at the moment of case assignment. Item (31) may also be a blend of the two competing target expressions *habe ich ihr einen Kuss gegeben* and *habe ich sie geküsst* (*I have kissed her*).

6.3.3. Confusion with the dative case

Seventeen items are unequivocal substitutions of dative for accusative (five in prepositional phrases).

Dative assignment after prepositions with the accusative or variable case:

grade 5/6

(32) <... gegen der (die) Küste stürtzten (stürzten), später stoßen sie gegen eine Hügelkette> (... *plunged against the coast, later they strike against a hill*)

grade 6/7

(33) <fliegt ... in den (die) Ferien> (*flies off for the holidays*)

(34) <stellt sich auf dem (den) Acker> (*places himself on the field*)

(35) <geht durch dem (den) Acker> (*walks across the field*)

grade 7/8

(36) <er setzt sich auf der (die) Parkbank> (*he sits down on the bench*)

grade 8/9

-

Dative assignment in accusative complements:

grade 5/6

(37) <Er schützt den (die) Dorfbewohnern (Dorfbewohner)> (*It protects the villagers*)

grade 6/7

(38) <brachten ihm (ihn) zum Krankenhaus> (*admitted him to hospital*) / draft: <Polizisten bringen ihm (ihn) zum Krankenhaus> (*Policemen admit him to hospital*) (reoccurring error, see item (42) below)

(39) <wir werden der (die) Frau, die uns geruft (gerufen) hat, suchen> (*we will look for the woman, who called us*) / draft: <Ruft der (die) Polizei> (*Calls the police*)

(40) <schlägt dem (das) Gespenst> (*hits the ghost*)

(41) <damit sie dem (den) Acker schonen> (*that they save the field*)

grade 7/8

(42) <bringen ihm (ihn) zu seinem Haus> (*bring him to his home*) (reoccurring error, see item(s) (38) above)

(43) <holt ihm (ihn) ab> (*picks him up*)

(44) <wird über einem (einen) Jugen (Jungen) ... erzählt> (*tells a story about a boy*)[39]

(45) <... den (die) Robben zu fotografieren> (... *taking photographs of the seals*) (nonce mistake)

grade 8/9

(46) <bittet ihm (ihn) um Hilfe> (*asks him for help*)

(47) <Danach hat sie mir (mich) gefragt ... > (*Afterwards she asked me ...*)

(48) <Ich bin doch an (in) ihr (sie) verliebt> (*I am really in love with her*)

12 out of 14 uses of the dative with accusative-governing verbs (including prepositional verbs) involve animate nouns (exceptions are (41) and (45))[40]. Note that inanimate nouns with *suchen*, *schlagen*, *bringen* and similar verbs always had the correct accusative ending. This clear case of transfer from Spanish will be discussed in 6.4.1. In the five errors in prepositional phrases no animate nouns were involved (items (32) - (36)). In (40), frequently used constructions with a modifier, like *jemandem auf den Kopf hauen* (*to hit somebody on the head*), may have favoured the application of the dative.

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39 In item (6) above an inanimate object with *erzählen über* had the nominative ending.

40 14 times animate accusative complements had the correct accusative ending.

6.3.4. Difficulties with adjective inflexion

The following eleven examples, as well as (17) and (27) violate the German inflectional pattern of the adjective within the nominal phrase:

grade 5/6

(49) <in mein (meines) Onkels Haus> (*in my uncle's house*)

(50) <das höfliches (höfliche) benehmen (Benehmen)> (*polite manners*)

grade 6/7

(51) < in der nächste (nächsten) Woche> (*(in the) next week*)

(52)<durch unterirdischen (unterirdische) Gewässer gehen> (*go through subterranean waters*)

(53) <der mutiger (mutige) Mann> (*the brave man*)

grade 7/8

(54) <verlieren ihr seidenweichen (seidenweiches) Fell> (*loose their silk-soft fur*)

(55) <seine wenig gelockte (gelockten) Haare> (*his a little curled hair*)

(56) <seine kleine (kleinen) Ohren> (*his little ears*)

(57) <seine hellbraune (hellbraunen) und kleine (kleinen) Augen> (*his light-brown and little eyes*)

(58) <seine knöcherige (knöcherigen) Wangen> (*his bony cheeks*)

grade 8/9

(59) <seine eigene (eigenen) Freunde> (*his own friends*)

All items are internally inconsistent. However, items (3), (6), (7) and (10) show that E. could formulate internally consistent nominal phrases with adjectives. Eight items ((50), (51), (53) and (55) - (59)) are overgeneralisations of the so-called strong declension of adjectives[41], ignoring the weak declension. This overgeneralisation is a simplification in so far as the endings of the determiner and adjective are linked by analogy. Only (17) and (52) could be interpreted as substitutions of weak for strong declension.

Finally it is possible that frequent wordform sequences, such as *nächste Woche* (*next week*) in (51), *kleine Ohren* (*little ears*) in (56), etc., were habitualised, and stored and accessed as stereotypes. Another case in point, beyond the scope of strong adjective declension, is *entscheidet sie zu helfen* (*... she decides to help*) in (29). The examples have in common that a grammatical word group was put in an

[41] A good overview of strong, weak and mixed declension is found in Eisenberg (1994, 234 f).

unfitting syntagma. Hence some of the errors in grammatical case, presented here, may have been due to a processing mode where phrase-lexicon entities as a whole were retrieved without further morpho-syntactical processing.

6.4. Discussion

E. had some persisting insecurities in the use of German grammar, but not in the use of Spanish grammar. German and Spanish literacy acquisition were not delayed, despite of slight phonological underrepresentations in German. While the few spelling errors were due to performance phenomena or unfamiliarity with infrequent entities, E.'s problems with case markers, still present at the end of the survey of four years, were clearly not just lapses. Insecurities emerged as reoccurring errors in certain contexts, which suggests that rules were not yet automatised (see 3.4.2. above): The dative appeared with animate complements, the nominative was overgeneralised in appositions, and the accusative was overgeneralised after prepositions with variable case. Reoccurring errors emerged, although E. improved in applying self-corrections of case markers in his essays. When writing, he had enough time to monitor for grammatical correctness and he could spend more time on self-correction. Anyway, the remaining case errors in essays confirm that the strategy of applying learned case rules requires strong controlled processing. Habitualised patterns always can counteract this cognitively demanding process.

The distribution of E.'s errors in grammatical case by and large reflects the evolutional steps of monolingual case-system acquisition, as described in Mills (1985, 157). According to Mills one of the greatest obstacles in the monolingual acquisition of German is the accusative case. Until the age of four and even later it is replaced by the nominative case[42]. Later, when the accusative is better established, the advanced strategy of using it in contexts, where a dative should be applied, is productive in monolinguals. This tendency is also visible in E.'s errors in grammatical case in prepositional phrases, but not in verbs. Here, he produced 12 dative for accusative substitutions (10 in human nouns) and only 4 accusative for dative substitutions (all in pronouns). Another striking difference, compared with monolingual development, is the long persistence of insecurities. Although German monolinguals have transitional difficulties with the case system, they acquire it with

[42] E.'s error data suggest a similar development. While in grade 5/6 he produced 4 nominative and 3 accusative overgeneralisations, in grade 8/9 he produced only 1 nominative, but 9 accusative overgeneralisations.

relative ease, while E. produced case-marker errors up to the age of fifteen and later[43].
In the following sections we will discuss possible influencing factors for ...

(1) ... the considerable number of dative "overgeneralisations" in E.'s error sample.
(2) ... the long persistence of problems with grammatical case despite early and endogeneous bilinguality of E.
(3) ... the imbalance between orthographic and grammatical competence.

6.4.1. Levelling - Semantic animacy and the dative case

In 6.3.3. we have seen that E.'s tendency to use dative in animate complements led to errors in German. This tendency is striking in so far, as in German complements the dative is the marked case. The following constellation of difficult linguistic circumstances may have led to syntactical problems in German, i.e. a tendency to level out the accusative, when complements were animate:

- Dative complements in German often are animate.
- In Spanish, the prototypical use of *a* is to mark the animate indirect object. One of these features may be absent, i.e. inanimate indirect objects and animate direct objects are also marked by *a*. Transfer from Spanish leads to overgeneralisations of the dative in German in animate accusative complements.
- When proper names occur as complements in German there is no distinction between accusative and dative verb complements.

Again we see (as in 5.3.1., or 6.2. above) that difficult language-specific rules in combination with bilingual levelling phenomena can lead to persisting developmental problems, here on the grammatical level.

Various other surface errors in German probably were also connected to underlying false analogies from Spanish syntax, such as items (46) and (47). The applied verbs *pedir*/*bitten* (*to ask for*) and *preguntar*/*fragen* (*to ask*) govern an

[43] The same is true of various subjects of our observation sample with different language backgrounds.

indirect complement in Spanish, but not in German.

6.4.2. Impact of perceptual salience and rhythmical processing on early grammatical development in Spanish-German bilinguals

In German, case assignment is a syntactical problem. The oblique cases are governed by prepositions, verbs and sometimes by adjectives (such as *du bist mir verwandt* (*you are a brother in mind*)). But case assignment also is a morphological and morphonological problem, since case endings occur on determiners, quantifiers, adjectives and nouns. Szagun (2006, 74) points out that one of the factors for the relatively late acquisition of German case markers in monolingual German children is phonetic similarity of *n* and *m* in endings. In this position they can be confused easily. Certainly this is not the only difficulty to perceive some case markers, as assimilation processes in fluent German even can change their realisation (loc. cit., 97 f). For example, preceding a bilabial phoneme, the realisation of /n/ is [m] in normal speech (Kohler 1995, 207). 36 out of 59 case errors, produced by E., can be explained by low perceptual salience of case markers[44]:

- *-nen* and *-nem* were reduced nine times to *-n* (see 6.3.1. above) and one time *-nen* was substituted for *-n*.
- *-en* / *-er* were reduced ten (seven / three) times to *-e*, only one time *-en* is substituted for *-e* (see 6.3.2./4. above).
- *-n* and *-m* were exchanged sixteen times one for another (see 6.3.2./3. above).

E. produced slightly more errors with than without phonetological similarity between target and attempt in various inflexional patterns (more *ihm* - *ihn* (*him* dative - accusative) confusions than *ihr* - *sie* (*her* dative - accusative) confusions, etc.). The data suggest that low perceptual salience of various German grammatical case markers was one factor, which in E.'s case led to an incomplete case-marker system in the critical phase of building a more refined grammatical system.
Distinct rhythmical organisation between Spanish and German is another factor, which additionally may have hampered E.'s acquisition of phonetic cues to decode

[44] The term perceptual salience refers to the ease of perception of a given marker. It is assumed that an easily perceivable suffix, or other functor, will be acquired earlier than a suffix, with lower perceptual salience (Goldschneider & DeKeyser 2005, 47 f).

case information. While German is a stress-timed language, Spanish is a syllable-timed language (Kohler 1995, 116 f). In stress-timed languages the sequences between stressed syllables have approximately the same length. The more syllables fall between two stress peaks, the higher will be their degree of reduction. In syllable-timed languages, on the other hand, all syllables approximately have the same length. Delattre (1966) found that German stressed syllables can be 60 % longer than unstressed syllables, while in Spanish the difference is only 10 %. In analogy to the notion of a shallow writing system (see 2.4.3. above), it could be claimed that Spanish has a "shallower pronunciation", too, because the phonetic shape of speech represents more closely the underlying phonology in comparison with German where the written form is the most phonology-like representation, and where especially grammatical suffixes are often reduced or assimilated in fluent speech (notice the confusion of different forms of the article *ein*, *einem*, *einen*). As both languages require a distinct rhythmical perception mode, and E.'s language contact with German began at the age of three, he must have parsed German speech in a syllable-timed mode, at least until the development of a stress-timed processing mode. In this transitory phase, the differences between Spanish and German in parsing speech into rhythmical units, important for decomposing speech for further linguistic processing, possibly led to a delay in perceiving light syllables with consonantic nuclei in German, which are important for the discrimination of grammatical information on case. Morphological important information was levelled out perceptually. As a consequence of this parsing influence from Spanish, the perception of grammatical case markers at an early stage was limited and an incomplete case-marker system was acquired and automatised before alphabetisation.

In the study of D., L 1 influence concerned shallow writing intruding under confined monitor conditions (see 5.3.1. above). Shallow writing and syllable-timed parsing in German are two examples of influences from one language on another. They are ways of language influence more abstract than earlier conceptualisations of transfer and interference would suggest.

6.4.3. Language-variety influence in alphabetisation

Low variants and context-bound language are rarely used in writing, if we disregard internet chatting, mailing and short notes where the violation of spelling and grammar standards and colloquial vocabulary are normal. E. spent little time on the

internet for chatting purposes (see 6.1.1. above) in Spanish and even less in German, and he rarely read German comics. For E., the use of German in all language modalities mainly was a vehicle for formal education. Although E. had less exposure to the German language than D., some conditions of language acquisition led to a smooth acquisition of German orthography:

- The language contact always was in the standard variety (for this term see 2.2. above) of German.
- At home, German was not spoken and at DSM the predominance of a certain dialect is not likely[45]. Thus no danger of interference with the phonology of a regional or social variety emerged.
- With his peers he talked in a Spanish adolescent variety but rarely used colloquial German. He acquired and learned "his" German from the school environment where the variety spoken and taught is more standardised and also more decontextualised than family- or friend talk.
- German orthography was not influenced as strongly by word pronunciation, due to E.'s consecutive bilinguality (more detailed, see 6.2. above).

D. on the other hand, was competent in various varieties of German and practised writing in non-standard varieties, regularly. In the written medium, he made use of all kinds of language, standard and non-standard. From time to time, he was not able to keep norm-deviant influences out of writing in school. He mixed varieties and violated norms of written language and standard pronunciation. All these influences, violating norm-conformity, were not present during E.'s literacy development in German.

According to Romaine (1995, 170) two different languages, such as Spanish and German, can be looked at as varieties, too, if the speaker switches between them to vary in style. This ability points to a high proficiency in both languages. After all that was mentioned about E., we know that, as far as the survey is concerned, he rarely switched between German and Spanish, nor was he equally fluent in German compared to Spanish, and he had little exposure to context-embedded German. So we can claim that his proficiency in pragmatic and social abilities was less developed in his second language. Surely in Spanish it was easier for him to tell or

[45] The staff members come from all over Germany and standard German is the variety they have in common.

understand a joke or to achieve ends in daily living, such as persuading that his point of view is correct. His sensibility to differences in registers other than the register of "school usage" was more evolved in Spanish. Regarding these abilities, he can be described as a dominant bilingual. But in his mastery of some other functions of language he fulfills the criteria of a balanced bilingual. For example, he could understand and work in school in either language, normally taken to be crucial evidence for balanced bilingualism (Baker 1996, 8). A more refined definition of E.'s competence in both languages maybe achieved, if we apply the distinction between BICS and CALP, suggested by Cummins (1984, 136 ff) (more elaborated in Cummins (2000)). BICS and CALP are acronyms for two different kinds of language competence. The first stands for "basic interpersonal communicative skills", the second for "cognitive academic language proficiency". Relating the functions of non-standard varieties, normally context embedded, more with BICS and the functions of standard varieties, normally context reduced, more with CALP, E.'s bilingual competence can be considered as dominant in conversational proficiency and balanced in cognitive academic language proficiency. D., on the other hand, was balanced in BICS as well as in CALP. Indeed his mastery of some CALP-functions, such as orthographic accuracy, was not as developed as E.'s, partly due to the influence of non-standard varieties and mixing habits. E.'s grammatical problems in decontextualised language, on the other hand, can be partly put down to his BICS-development in German. A lack of experience with child-to-child and parents-to-child discourse in German during early childhood led to a gap in fundamental grammatical exposure in a simplified, but well-formed version of L 2, which is an important developmental factor in bilingual language acquisition (see 2.1.2. above).

6.5. Conclusions

E.'s problems were those of an advanced learner. As the analysis of his error data has shown, E.'s development in German was influenced by the following features of his bilinguality before and during alphabetisation:

(1) In German most verbs with a single complement govern the accusative case but due to transfer from Spanish E. overgeneralised the marking of animate objects by the dative. Transfer was invited by difficulties to distangle the German dative and accusative rules.

(2) Due to transfer German speech was parsed by syllable-timed processing until the stress-timed mode, necessary in German, was developed. In this span the acquisition of suffixes or functors with low perceptual salience was difficult.
(3) Lack of exposure in a simplified but well-formed version of German used with children by native speakers.
(4) Simultaneous learning of German vocabulary in its spoken and written forms.
(5) Levelling of German *s*-phonemes, as well as of the short/long-phoneme distinction in German vowels. In individuals without alphabetisation delay, as E., phoneme-allophone deviations won't harm orthographic accuracy, as long as direct word retrieval via the visual path is preferred.

Factors (1) - (3) evoked a delay in case-assignment proficiency before alphabetisation started. E. got accustomed to the use of an underspecified inventory of suffixes, until in school education, case rules and the corresponding inflectional forms were learned and his deficits became visible in his written German grammar tests, dictations and essays. As a consequence, graphotactical suffixes, such as <-em> and <-en>, were easily overlooked in reading (slips of the eye), having no phonological correspondences. Later, despite the growth of grammatical awareness, now and then habitualised sequences intruded in oral speech and writing as context-sensitive errors. Insecurities emerged more often in spontaneous speech where conscious monitoring was more difficult. Factors (3) and (4) supported a smooth orthography in his weaker language, not influenced by features of non-standard varieties, such as differing word pronunciations.

In this case study we found insights for our third research question, if grammatical skills, relevant especially in the written variety, are differently developed in bilinguals compared to monolinguals during the same stage of acquisition. The qualitative error analysis of deviations in grammatical case showed that the development of such skills can differ between bilinguals and monolinguals, when the development of difficult and differing language-specific rules is disturbed by levelling phenomena.

Habitualisation of a simplified and unified case-marker system should be avoided by the speaker himself and by those, who teach him, as early as possible. This would be especially helpful for children with insufficient, and/or late exposure to German, where it is not spoken at home, or where at least one of the parents,

especially the mother, uses a non-standard grammar. The design of units for an early intervention of case-marker development goes beyond the scope of this study.

7. Case study 4 - Factors of multilingual acquisition in a trilingual

In this case study a participant is presented, who was brought up in three languages, Spanish, German and Italian. His acquisition profile shows an early use of an advanced repertoire in syntax and vocabulary. Nevertheless, a relatively frequent appearance of blends, as well as deficits in reading accuracy and persisting problems with morphonologically irregular suffixes were still observable in German at an adolescent age. The error analysis of blend data suggests that A. applied various bilinguality strategies, such as transfer, joint structures and language-specific analogies, to build morphologically complex entities, mostly verbs, from basic, holistically stored lexical items. In reading and writing strong reliance on holistic retrieval strategies and occasional shallow writing were identified.

7.1. Developmental and academic history

A. grew up in a trilingual home and at the end of a survey of five years, he was sixteen and attended the tenth grade of grammar school at DSM, Deutsche Schule Madrid (German School Madrid). A. and his sister, by three years his senior, were born and brought up in Madrid, just like their mother and her brother and sister. A.'s grandmother is Spanish and at home Spanish predominated, but German and Italian also were spoken in the family context. Communication with his father, an Italian, sales manager of an automobile company, was in Italian and mother-son communication mostly in German. The mother's grammatical competence in German was superior but not native-like, due to regressive bilingualism of second immigrant generations (Mackey 1987, 705 f). With his deceased grandpa A. always talked in German. All throughout the survey I have known A. as a disciplined boy/adolescent with many interests, more fluent in Spanish than in German and Italian.

Like J., D. and E., A. went to a German kindergarten in Madrid from the age of three onwards. And like them he went on to pre-school at DSM. While for E. and J. the "external" exposure to German was essential, having none, respectively little at home, for D. and A. exposure to German before kindergarten already existed. The boy's multilinguality profile can be described as follows:

(1) Simultaneous childhood trilinguality: Language acquisition commenced in three languages, with most exposure to Spanish and least exposure to

Italian. Acquiring three languages in childhood will put a temporal overload on linguistic processing. Since age eleven, in grade 5/6, A. started to learn EFL at school. Since Italian seemed to be the weakest of his three childhood languages and since in German he was less proficient than in Spanish, more mutual influence between Italian, respectively German and English is likely than between Spanish and English.

(2) Endogenous multilinguality for German but not for Italian: A German community was present at home, in school and on holidays. There was no Italian reference group in the school environment.

(3) Additive trilinguality: All three languages are valorised in the environment, a fact that favours cognitive advantage, and indeed A. scored above average in most school subjects.

(4) Tricultural multilinguality: A.'s cultural identity was primarily Spanish because of his predominant socialisation in the network of his home country. He identified positively with the other two cultures, too. For example he had a favourite Spanish, Italian and German football club, in this order. His self-confidence turned out to be more perceptible in Spanish than in German, due to his language proficiency in Spanish and his knowledge about Spanish history, to mention two evident factors. German can be considered mainly as the language of learning, although identification with German culture grew at the age of fourteen. The most important functions of Italian were father-son communication and reading about sports.

(5) Slightly dominant multilinguality in direction of balanced multilinguality: His proficiency was somewhat greater in Spanish than in German and Italian (see 7.1.1. below).

(6) Partly compound trilinguality.

7.1.1. Language background

At the age of fourteen A. reported the following language use with family members, outside the family context and for daily activities. He talked more Italian than Spanish with his father, since his dad insisted on Italian in father-son conversations. A. and his mother talked more in German than in Spanish. With his sister it was nearly always Spanish, only when they did not want to be understood by others, their conversations were in German or Italian. The boy remembered that until the

death of his grandpa, when A. was eleven, he and his grandfather always talked in German. Every day they told each other stories. Apparently, rather than conversing, A. listened to the exciting narrations about hunting in the woods and German song lyrics. It is likely that his grandpa made intensive use of German idioms, phraseologisms, proverbs, etc. A. remembered that he understood the narrations. Only now and then he had to ask for the meaning of a word. For the grandfather-grandson communication we can assume a tendency towards passive bilingualism (see Mackey 1987, 704). There are two more near relations with whom A. regularly used German, two times per month with his uncle and once a week with his aunt. Although, with her, Spanish was preferred, as well as in conversations between more than two family members. One function of the use of German in the family context and with near relatives was the expression of unity. Communication with his grandma was in Spanish only. In conversations with both parents Italian predominated, because the father was not proficient in German.

Outside the family context, with his peers, according to his own estimate he talked four times as much in Spanish than in German, never in Italian. German was mainly used with friends, whose competence in Spanish was too poor. Nevertheless, A. recognised that lately German became more important with new acquaintances. In the school lessons he had four times more exposure to German than to Spanish. Additionally A. received weekly units to increase his proficiency in decontextualised as well as in contextualised written and spoken German from grade 5/6 on.

With two exceptions A.'s Spanish score for language activities is much higher than the German or Italian score. Reading books in spare times was the only activity with a slightly higher score in German. However, similarly to D. and E., he did not read many books and seldom finished them. Another similarity to his school mate D. was that both had exposure to various styles of their languages, a constellation favouring a tendency towards a monolingual-like range of competence. The resulting transitory overload may have caused some spelling insecurity in German until grade 7 (see 7.2. below). Although A. has not been alphabetised in Italian at school, his father taught him to read Italian, and he regularly read an Italian sport magazine. According to his own estimate he produced many spelling and some grammatical errors, for example, when he wrote to his Italian relatives. In his favourite sport disciplines he thought in Italian. For distance communication A. preferred the telephone to the computer and every day he talked with somebody in German on the telephone. German was the language for calculating as well as for thinking in the German lesson. On these occasions we can assume a minimum of

conscious preformulation activity in the stronger language, Spanish. Only when his thoughts swerved, he switched to Spanish. A. dreamt in his three languages.

In sum, A. was triliterate in Spanish, German and Italian. In Italian he had little contact to decontextualised language and non-automatic language processes, which are important features for comprehension and use of written standard language (see 2.2. above). Seemingly, A. rarely mixed his languages, which were all used to express emotions, and to speak with family members. German and Italian were predominantly used to communicate with adults. In Spanish and German A. had a monolingual-like range of language competence.

7.1.2. Performance in school and in psychometric procedures

In his German and Spanish essays A. got marks between satisfactory and good. However his grammar and orthography turned out to be better in Spanish than in German. According to his error index[46], accuracy in Spanish essays vacillated between exellent and good, in German between sufficient and satisfactory. So he felt insecure before exams in German where he had to concentrate more on aspects of form than in his Spanish exams.

At the beginning of the second half of grade eight, his reading fluency, reading accuracy and text comprehension in Spanish and German were compared with a sample of monolingual fourth and sixth graders[47]. His reading aloud was hesitant, and not fluent. According to the results of the tests, the reading speed was satisfactory compared with Spanish fourth graders, respectively between good and satisfactory compared with German fourth and sixth graders. His reading accuracy turned out to be satisfactory in Spanish and German compared with monolingual fourth graders, but compared to monolingual six graders it vacillated between satisfactory and poor in German. In both languages the activation of near homophones caused word substitutions (*dispersa* (*diffuse*) instead of *despensa* (*store*), *schliff* (*dragged*) instead of *Schilf* (*reed*), *grobmagisches* (*coarse magical*) instead of *grobmaschiges* (*coarse-meshed*), etc.). In 2.4.4. it was argued that isolated holistic processing gives rise to confusions of similar looking words in reading and

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[46] At DSM formal accuracy was measured by a so-called error index. Number of grammatical violations, vocabulary deviations and transcription errors (spelling and punctuation mistakes) were taken into account to calculate this value.

[47] The applied psychometric procedures were TALE (1990), ZLT (2003) and ZLVT (2002), introduced in 3.3. above. Standardised results for eight graders were not available. The tests' maximum grade limits are grade 4, respectively grade 6.

writing. And indeed performance insecurities, such as his retrieval carelessness errors, show that A. avoided slower sublexical processing, even in difficult words. The fact that reading speed in German turned out to be more satisfactory than reading accuracy, backs the assumption that holistic processing speeds up the reading process, and isolated holistic processing leads to a decrease of reading accuracy. In the following sections more evidence of holistic processing is presented. Text comprehension was also affected by word substitutions and turned out to be only satisfactory, compared with Spanish monolingual fourth graders, as well as with German monolingual fourth and sixth graders. In comparison, reading comprehension was best for D. in German, and for E. in Spanish.

7.2. Analysis of spelling errors

The number of A.'s spelling errors per hundred words was 3,6 % in grade 5/6 and reached a value of less than 1 % in grade 8/9. A.'s level of spelling accuracy in grade 8/9 reached a level that E. had already reached in grade 7/8, whereas his orthographic correctness in grade 5/6 was approximately comparable with the one, D. reached three years later. Nevertheless, in the first year of the survey, A.'s eleven segmental and retrieval slips, were similar to those produced by D.:

(1) Occasional blends
A. produced two such blends, <gehorstsamer> for <gehorsamer> and <gegenseitlich> for <gegenseitig>, D. one, <sahs> for <saß>[48].

(2) Interference
Lexical and/or graphemic interference concern four of A.'s spelling errors in grade 5/6, <in generell> for <im Allgemeinen> (see table 7.4 below), <critisierten> for <kritisierten> (*criticised*), <geräuch> for <Geräusch> (*noise*) and <Burche> for <Bursche> (*lad*), and two of D.'s lapses, <igal> for <egal> and <nexten> for <nächsten> (both see table 7.4 below).

(3) Lapses concerning consonant clusters with *t*
A. produced five such *t*-lapses, <sitzten> for <sitzen> (*sit*), <nich> for <nicht> (*not*), two occurrences of <nächten> for <nächsten> (*next*), <gesteift> for <gestreift> (*striped*) and <at> for <alt> (*old*). D.

[48] Translations of targets and distractors of blends are given in 7.3. below where an error analysis of blends is presented.

produced two such items in grade 5/6, <segel> for <segelt> (*sails*) and <geschlechtstreif> for <geschlechtsreif> (*sexually mature*).

(4) Perseveration of syllable parts

A. produced no perseverations in grade 5/6, D. produced three: <Benehemen> for <Benehmen> (*manners*), <Umgegun> for <Umgebung> (*environment*) and <Am amfang> for <Am Anfang> (*in the beginning*).

Beside occasional double-checking deficits A. had some pronunciation and spelling problems with German voiced and voiceless *s*[49]. In the following, the errors are tabulated:

	<s> instead of <ß> / [z] instead of [s]	<ß> instead of <s> / [s] instead of [z]	others
grade 5/6	<auserhalb> (*outside*)		<sonzt> (*sonst* (*else*))
grade 6/7	<verlies mich>(*left me*)		<Halz> (*Hals* (*neck*))
grade 7/8	-	self-correction: <grauß...grausame>	-
grade 8/9	*äu*[z]*ersten* (*upper*)	nonce mistake: <dießer> (*this*) *Gla*[s]*es* instead of *Gla*[z]*es* (*glass*, genetive case)	<Gefängniss> (*Gefängnis* (*prison*))
grade 9/10	spontaneous speech: *Stra*[z]*e* (*street*)	<Biergläßer> (*beerglasses*)	-

Table 7.1: Read and written substitutions of the voiced and voiceless *s*, produced by a Spanish-German-Italian individual between grades 5/6 and 9/10. The written exemplars are given in angle brackets, read exemplars with the false *s*-sound in square brackets.

The distribution of written exemplars across time in table 7.1 suggests a shift from simplification until grade 6/7 towards hypercorrection, i.e. overuse of *ß* from grade 7/8 onwards. Two of the *ß*-overgeneralisations are clear performance errors, the self-

[49] For a description of German and Spanish *s* phonemes see 6.2. above.

correction <grauß ... grausamer> and the nonce mistake <dießer>[50]. Another candidate for execution carelessness is *Gla*[s]*es* where some regressive-assimilation influence is possible.

The spelling errors <auserhalb> and <auserdem> (both grade 5/6) would be explainable as activations of the particle *aus* (*from*) from A.'s retrieval box, possibly because of a lack of an underlying lexicon form *außer* (*except*). An alternative or additional influence would be a norm-deviant pronunciation habit for some words, at least under certain circumstances, such as reading aloud, as in the reading error *äu*[z]*ersten* from grade 8/9 or *Stra*[z]*e* in spontaneous speech in grade 9/10. Despite this pronunciation deviation, A. spelled *außerdem* correctly in his essays 4 times in grades 7/8 and 8/9. Finally, the errors <Biergläßer> and <Bläßer> may be due to a misinterpretation of the devoiced forms *Glas* and *bläst* as the underlying ones, or by the simple fact that the *s* occurred with a variable feature ± voice.

In sum, the presented data provide evidence for paradigmatic and syntagmatic insecurities. It can be assumed that the reoccurring <s>-<ß>-spelling confusions and the false /z/-/s/ pronunciations in German were triggered by an early levelling out of the different *s*-phonemes. Unlike E., who treated /z/ and /s/ as complementary variants of the same phoneme (see 6.2. above), A. sometimes chose his spelling on the basis of surface structure, and sometimes based on the supposed underlying structure. Occasional reliance on surface structures can be interpreted as shallow-writing influence from Spanish (and Italian). This claim is backed by seven additional spelling errors from the first year of the survey where A. rather relied on pronunciation, which is the main principle in Spanish graphotaxis (see 2.4.3. above), than on underlying structures, which is the main principle in German graphotaxis:

<nerwös> for <nervös> (*nervous*)
<brawer> for <braver> (*well-behaved*)
<villeicht> for <vielleicht> (*perhaps*)
<anschließend> for <anschließend> (*afterwards*)
<.Forsichtig> for <.Vorsichtig> (*carefully*)
<Hemt> (2x) for <Hemd> (*shirt*)
<Kreutern> for <Kräutern> (*herbs*, dative)

Unlike D., whose shallow-writing slips mainly were singlings in consonant clusters (see 5.2.2. and 5.3.1. above), A. showed a tendency towards hypercorrection with the consonant-doubling rule, as three false analogies from grade 5/6 suggest:

[50] Two lines before *dieser* was spelled correctly.

<fasst> (*catches*) (4x) for <fast> (*nearly*)
<interessannt> for <interessant> (*interesting*)
<herrein> for <herein> (*(come) in*)

A.'s relatively small number of consonant-doubling errors in grade 5/6 was in the range of the average value of German monolinguals of the same age. Nevertheless, it was not until grade 7 that the striking number of other spelling errors, many of them slips, suddenly decreased, when A. overcame a threshold in full alphabetisation. It simply took him so much longer to develop a rich visual memory for German words, because of the simultaneous alphabetisation in three languages, and since grade five in English as a fourth one. The remarkable increase of spelling accuracy in grade 7 was also manifest in an increase of stable orthographic self-repairs.

7.3. Error comparison in grammatical case

Compared with E., A. produced 30 % more words in his exams throughout the survey. For both boys, the relative frequency of case errors turns out to be similar[51]. The overall values are similar, but there are differences in some of the observed case-error types. The following comparison shows the most striking differences and similarities:

1. Overgeneralisation of the nominative
   Example: < ... erzählt über ein normaler Tag> (E.6)
   Total amount of occurrences: E. = 10 (see 6.3.1. above), A. = 9
   Every 417 words E. produced a nominative overgeneralisation, A. every 633 words.

2. Accusative after a dative prepositions
   Example: <mit einen (einem) mächtigen Ritter> (*with a powerful knight*), A., grade 5/6
   Total amount of occurrences: E = 7 (see 6.3.2. above), A. = 19
   Every 300 words A. produced an accusative after dative prepositions, E. every 595 words.

[51] Note that in the last year of the survey E. produced fewer case errors than his school mate.

3. Dative assignment in accusative complements
   Examples: <Er schützt den Dorfbewohnern> (E.37)
   <Jetzt bring ich dir (dich) ans Ufer> (*Now I take you to the shore*), A., grade 6/7
   Total amount of occurrences: E. = 15 (see 6.3.3. above), A. = 14
   Every 278 words E. produced a dative in verbs governing the accusative, A. every 407 words. In grade 9/10 A. no longer produced such errors.
   Although the overall values are similar for both boys, the affected parts-of-speech are nearly always pronouns for A. (see example), while for E., determiners and pronouns are equally affected. For both boys, 90 % of the misused dative in direct-complement position concern animate complements (see examples), a phenomenon certainly due to interference from Spanish (see 6.4.1. above).

4. Difficulties with adjective inflection
   Example: <das höfliches benehmen> (E.50)
   Total amount of occurrences: E. = 11 (see 6.3.4. above), A. = 8
   In a description essay from grade 7/8 the number of adjectives with false inflection was similar, i.e. 6 out of 25 adjectives for E. and 5 out of 27 adjectives for A.

Phonetological and morphonological aspects of case errors:

5. Reduction of grammatical endings (*n* instead of *nen*/*nem* , *e* instead of *en*/*er*)
   Example: <zu sein Steuermann> (E.1)
   Total amount of occurrences: E. = 20, A. = 7
   Every 208 words E. produced a reduction (nearly four times as often as A.). Although A. had more spoken exposure to German than E. he only produced a reduced ending every 813 words. On the whole, A. was grammatically more proficient than E., or he used his knowledge more analytically, while E. wrote in an oral mode from time to time. A.'s avoidance of risk taking in language use also accounts for the small number of reduced grammatical endings.

6. Substitution of grammatical endings (*n* instead of *m*).
   Example: <In diesen (diesem) Moment> (*in this moment*), A., grade 6/7
   Total amount of occurrences: E. = 8, A. = 33
   Every 173 words A. produced *n* instead of *m* (nearly three times as often as E.), E. every 521 words. Twenty-nine of A.'s "*n* instead of *m*"-substitutions occurred in determiners, twenty-two of them precede a noun with masculine gender[52], while no masculine noun was affected by false dative application. Twelve substitutions precede a word, which starts with an alveolar sound[53], nine precede a word with initial vowel, eight with /g/, /k/, or /h/, two with a bilabial, and two with /f/. He did not assimilate for place of articulation, when the following word started with a bilabial phoneme (see example).

The question arises, if we can refer to the biggest part of A.'s "*n* instead of *m*"-substitutions as accusative overgeneralisations at all. The results rather suggest a tendency towards encoding masculine determiners with an *n* in the dative and/or assimilation influence of the following sound, because ...

- ... most "*n* instead of *m*"-substitutions occur in determiners preceding a masculine noun.
- ... the majority of the "*n* instead of *m*"-substitutions precede an alveolar speech sound or a vowel.
- ... no "*m* instead of *n*"-substitutions occur in determiners preceding a masculine noun.

Underlying difficulties with the dative assignment are not likely at this acquisition stage, as a closer look at one of his exams from grade 7/8 shows: Admittedly he produced the two errors <bis zu den (dem) Gürtel> (see above) and <mit einen (einem) gestreiften Muster> (*with a striped design*) here, but in seven masculine nouns and three neuter nouns the dative is correctly assigned in the determiner, such as in <von einem Gürtel> (*by a belt*). Additionally, both errors occur in succeeding

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52 Further examples are: < ... wachte aus seinen (seinem) gemütlichen Schlaf auf> (*he awoke from his cosy sleep*) (grade 5/6), < ..., der bis zu den (dem) Gürtel reicht> (*which extends to his belt*) (grade 7/8), <Er hat den (dem) Fahrer nicht geholfen.> (*He didn't help the driver*) (grade 9/10), etc.

53 Grade-9/10 data contain one example where in the same prepositional phrase feminine-dative is encoded correctly while masculine-dative is encoded with *n* and the following word also starts with *n*: <... erwähnt die Konkurrenz zwischen den (dem) neuen Präsidenten und der Sozialistin S.R.> (... *mentions the competition between the new president and the socialist S.R.*).

sentences, i.e. they are possibly due to the same distracting influence. Finally, the dative in the determiner of the word *Gürtel* is one time correctly and one time erroneously assigned in the same exam. So the presence of a nonce mistake, a continuation error and a majority of correct items provide evidence that in grade 7/8 A.'s false masculine-dative assignments were no system phenomena.

In the first two exams of the survey, however, the ratio between erroneously and correctly assigned masculine dative was worse (six errors and only four correct dative assignments). The comparison of our samples from grade 5/6 and 7/8 suggests that the number of "*n* instead of *m"*-substitutions not only decreased throughout the survey, but also that the number of dative constructions increased. We can not exclude the possibility that before the start of the survey A. may have been in a process of reconstructing a false determiner paradigm like the following:

	masculine	neuter	feminine
accusative	den / einen	das / ein	die / eine
dative	den / einen	dem / einem	der / einer

In this paradigm every gender has its unequivocal determiners in the accusative and the dative. We deal with a shift from homophony between masculine and neuter in dative to homophony between accusative and dative in masculine determiners. No homophony between the genders exists, just like in the the Spanish inventory of determiners. Transfer would be one cause to construct a determiner paradigm without gender ambiguity. The sound similarity between the nasals contributes to the shift, insofar as masculine is affected and not neuter where the difference between determiners in accusative and dative is phonetically more prominent. As a consequence of regressive assimilation in oral speech, a determiner-final *m* is often produced as [n], if the onset of the following word is an alveolar sound. And indeed, in A.'s data alveolar follows "*n* instead of *m*"-substitutions more often than any other place of articulation. The fact that A. used *n* instead of *m* in a neuter-dative context seven times, as in the already mentioned < ... mit einen (einem) gestreiften Muster> shows that he acquired the case rules in a phase where gender assignment was not completed.

In sum A. overcame the beginner strategy of nominative overgeneralisation in German relatively fast, a fact, which provides evidence for an analytic use of grammatical endings in the writing process. But in a transition stage he was overloaded with the variety of forms to acquire in his three languages. It is likely that the principle from Spanish that no ambiguity for gender in determiners exists

was overgeneralised by A. before the survey began, and that the principle was applied to German. The affected system parts concern items, which are morphonologically irregular (homophony) in German. Assimilation processes in oral speech favoured the shift. At the end-of-the-survey stage, assimilation influence still led to occasional "*n* instead of *m"*-substitutions, when the following word started with an alveolar consonant.

The much higher reduction rate of grammatical endings by E. can be explained by simplification processes, because morphologically important information was levelled out perceptually at an early acquisition stage, or because sometimes in the process of writing he did not use an analytic strategy for grammar. E.'s problems with case markers are best explainable by an early-childhood underexposure to German (see 6.4.2. above).

Both boys transferred the principle from Spanish to German that animate nouns have to be marked differently from nonanimate nouns in complements. A. overcame this transfer phenomenon for nouns in grade 7/8 and for pronouns in grade 9/10. The delay of two years for pronouns can be explained by highly automatised use of pronouns. Direct transfer influence from Spanish pronoun forms can be exluded as a possible cause of longer dative overgeneralisation in animate German pronouns, as Spanish pronouns have no case marking.

7.4. Analysis of blends

Blends are fusions of two linguistic entities into one form. We can distinguish blends triggered by similarity of meaning from blends conditioned by similarity of wordforms. Both types of blends are due to paradigmatic processes on the word or sentence level:

(1) Wordform blends on the word level:
pain pills and *pain killers* fused as *pain kills* (Fromkin 1973, 260).
beautiful and *utilitarian* fused as *beautilitarian* (Pound 1914, 44).

(2) Wordform blends on the sentence level:
The first noun in the suppressed *Dann aber sind Schweinereien zum Vorschein gekommen* (*But then swinishnesses came to light*), and the second noun in the target sentence *Dann aber sind Tatsachen zum Vorschein gekommen* (*But then facts came to light*) fused as *Dann aber sind Tatsachen zum Vorschwein gekommen* (Freud 1901, 118).

(3) Meaning blends on the word level: *close* and *near* fused as *clear*.
(4) Meaning blends on the sentence level:
Didn't she become... and *She became...* fused as *Didn't she became...*
Poor boy! and *Too bad!* fused as *Poor bad!* (both items from Hill (1973, 207)).

Blends of type (3) often reveal the simultaneous activation of two near synonyms (Levelt 1991, 200 f) where the result is a fused expression, which often is a word in its own right. Sentence blends of type (4) are the result of two parallel encoded incompatible surface structures (loc. cit., 256). The data, Levelt and other scholars refer to, mostly are slips of the tongue of types (2) and especially (3) from adult speakers. Examples of type-(3) blends by pre-kindergarteners, such as *oldralgia* for *neuralgia* (Leopold 1949 vol.3, 115, footnote), *microfosi* for *micrófono* (own example), or the interlingual *bybydersehen* for *bye bye* and *auf wiedersehen* (Leopold 1949 vol. 3, 182), show that in early language acquisition blends are mostly neologisms.

Altogether 35 blends by A. were collected, most of them produced in his essays, others observed in oral speech and draft writing[54]. For comparison D. produced sixteen and E. rarely produced any blends in his exams. In the following, all blends, produced by A. and D. between the second half of grade five and the first half of grade ten, are presented. They are ordered according to the major error sources "wordform blends", and "meaning blends". In between we have the small number of blends with spelling- and idiom transfer from Spanish. Meaning blends are ordered according to word blends and sentence blends, i.e. types (3) and (4), and wordform blends are ordered according to the phonological similarity between target and attempt.

[54] Most non-exam blends were collected from the beginning of grade eight until the end of the survey.

7.4.1. Wordform blends

Table 7.2 contains all wordform blends where targets are compounds, and non-fitting lexical elements got activated and took the place of the correct ones:

target	possible distractor	attempt
gehorsamer (*obedient*)	Horst (German first name)	(A.1) gehorstsamer[55] (grade 5/6)
gegenseitig (*mutual*)	seitlich (*collateral*)	(A.2) gegenseitlich (grade 5/6)
hilfsbereite (*cooperative*)	Bereiche (*areas*)	(A.3) hilfsbereiche (grade 8/9)
grobmaschiges (*coarse-meshed*)	magisch (*magical*)	(A.4) grobmagisches (retrieval error in reading (grade 8/9)
Herausforderung (*challenge*)	hervor (*forth*)	(D.1) hervorderung (grade 6/7)
behandelt (*treat*)	Beer (Dutch first name)	(D.2) berhandelt (nonce mistake) (grade 7/8)
Gehirnerschütterung (*concussion*)	Schutt (*waste*)	(D.3) Gehirnerschuttung (grade 7/8)
Augenbrauen (*eyebrows*)	braun (*brown*)	(D.4) Augenbraun (grade 7/8)
Unfalls (*accident* genitive)	umfallen (*fall*, *collapse*)	(D.5) Umfals (reoccurring error) (grades 7/8, 8/9, 9/10)
jenseits (*beyond*)	jenen/seid (*those*/*are* 2. pers. pl.)	(D.6) jenenseid (draft, grade 8/9)
kostbarsten (*most precious*)	Bart (*beard*)	(D.7) kostbartesten (draft, grade 8/9)
miteinander (*together*)	Mitte (*middle*)	(D.8) mitteeinander (draft, grade 8/9)
Schachspieler (*chess player*)	Sache (*thing*)	(D.9) Sachspieler (nonce mistake) (grade 9/10)

Table 7.2: Word-formation errors due to phonological similarities, produced by two Spanish-German individuals between grades 5/6 and 9/10.

In the thirteen compound blends in table 7.2 the distractor is a morpheme, phonologically similar to one part of the compound. Except for the norm or system errors (A.2), (D.4) and (D.5) we deal with intrusions of words, which happened to be activated in the lexicon, i.e. retrieval insecurities in morphologically complex words. In (A.2), target and attempt only differ in the derivational adjective suffixes

[55] Here the form *gehorsamster* (*most obedient*) possibly was also activated.

-ig and *-lich*. Suffix choice depends on knowledge of the morphological system but also on lexical norms. (D.4) is explainable as a lexical confusion and pronunciation insecurity of an infrequent word (see 5.2.1. above). In (D.5) not only the wordform, but also the meaning of target and distractor are similar. A further case of word-formation blending is the oral slip *entfinden* (*ent-* is a verb prefix, *finden* means *find*) instead of *empfinden* (*feel*), which D. produced and immediately self-corrected in grade 8/9. The attempt fulfills criteria of German word formation but violates lexical norms[56].

Table 7.3 contains all blends where targets are morphologically simple words:

target	possible distractor	attempt
gemütlich (*comfortable*)	Mühe (*trouble*)	(A.5) gemühtlich (reoccurring error) (grade 5/6 & 6/7)
ziemlich (*quite*)	ziehen (*pull*)	(A.6) ziehmlich(er) (reoccurring error) (grade 7/8, 8/9 and 9/10)
atmen (*to breath*), Atem (*breath*)	Athmosphäre	(A.7) athmen, Athem (draft, grade 7/8)
elegant	Elle (*ulna*)	(A.8) ellegant (grade 7/8)
saß (*sat*)	sah (*saw*)	(D.10) sahs (grade 5/6)
unterirdischen (*underground* adj)	ihr (*her*)	(D.11) Unterihrdischen (grade 6/7)
gestaltet (*arranged*)	Stall (*stable*)	(D.12) gestalltet (grade 7/8)
folgenden (*following*)	voll (*full*)	(D.13) vollgenden (grade 7/8)

Table 7.3: Wordform blends with phonological identity and orthographic similarity, produced by two Spanish-German individuals between grades 5/6 and 9/10.

All eight attempts in table 7.3 violate German graphotaxis of morphologically simple words. Errors occurred in positions without adjacent morpheme boundaries. Distractors were orthographically known words, which were brought up, because the target orthographies were not activated fast enough. To illustrate, in (A.5) A. already had the word *Mühe* in his head, before he activated *Gemüt* (*temperament*), or the underlying lexeme *Mut* (*spirit*). The result was a substitution of the meaningful *müh*

[56] Although on the lexical level *entfinden* is an error, this blend shows, how deep the language-learner's understanding of the system can be: The underlying diachronical form of *empfinden* is the derivation *entvinden*, built of the verb prefix *ent-* and the lexeme of the meaning *to find* (Paul 2002, 270). The prefix was changed by assimilation (ibid.).

for the meaningless *mü*. The example shows that we are dealing with blends of two lexical entries and not only with sub-lexical processes. This group of blends suggests excessive retrieval activity, on which hypercorrection may have had some impact. The first four orthographic blends produced by A. contain additions of the letter <h> and (A.8) is due to misapplication of a simplified consonant-doubling rule that a short vowel is followed by two consonant graphemes (more examples see 6.2. above). All errors in tables 7.2 and 7.3 show unsuccessful attempts to solve spelling problems by misguided lexical retrieval. These attempts may even involve cognate words from Spanish and English or Spanish idioms:

target	possible primes	attempt
generell (*in general*)	im Allgemeinen (*in general*) en general (*in general* Spanish)	(A.9) in generell (grade 5/6)
egal (*anyway*)	igual (*same* Spanish)	(D.14) igal (grade 5/6)
nächsten (*next*)	next	(D.15) nexten (grade 5/6)
Motorrad (*motorbike*)	moto (*motorbike* Spanish)	(D.16) Mottorad (nonce mistake) (grade 7/8)

Table 7.4: Blends in spelling and blends with idioms, due to transfer from Spanish and English, produced in texts by two Spanish-German individuals between grades 5/6 and 9/10.

In comparison with intralingual wordform blends (see tables 7.2 and 7.3 above), interlingual blends were rare. The fact that D. produced more wordform blends than A. shows that he had more spelling problems than his peer, and/or that he tried more often to solve spelling problems by the attempt to establish connections between various available lexical forms.

7.4.2. Two words or phrases of similar meaning are fused

Table 7.5 shows that D. did not produce meaning blends, while A.'s blends predominantly concern synonyms and lexically related entries:

	Wordform blends, phonological		Spelling / Idiom transfer	Meaning blends in ...	
	no	yes		... words	... phrases
A.	4	4	1	8	18
D.	9	4	3	-	-

Table 7.5: Distribution of (mainly written) blends produced by two Spanish-German bilinguals between grades 5/6 and 9/10. Values represent the total number of blends.

D's blends show retrieval insecurities, negatively cued by other lexical entries (neighbors or cognates), without semantic involvement. A.'s blends, on the other hand, occurred more often on a processing level where one core meaning was transformed by the addition of a satellite element, such as a preposition or prefix (see below). On the following pages the 26 meaning blends produced by A. are presented.

Meaning blends in word formation:

(A.10)
Attempt: Einbewohner (reoccurring error) (grade 5/6 & oral, grade 8/9)
Target 1: Einwohner (*inhabitant*)
Target 2: Bewohner (*tenant*)

A. and D. used *Bewohner* correctly in one of their essays.

(A.11)
Attempt: im mittend (2 x) (grade 5/6)
Target 1: inmitten (*amongst*)
Target 2: mitten drin (*in the middle of it*)

(A.12)
Attempt: Menschenheitstraum (grade 5/6)
Target 1: Menschheitstraum (*dream of mankind*)
Target 2: Menschentraum (*dream of men*)

(A.13)
Attempt: Ortraum (grade 8/9), as opposed to *Zeitraum* (*period*)
Target 1: Ort (*place*)
Target 2: Raum (*space*)

In the same essay various occurrences of *Ort* , and one of *Zeitraum* appeared. In grade 5/6 A. produced the compound *Lebensraum* (*habitat*).

(A.14)
Attempt: in ehrlichkeit (grade 8/9)
Target 1: ehrlich gesagt (*to tell the truth*)
Target 2: in Wirklichkeit (*in reality*)

(A.15)
Attempt: liebartig (oral, grade 8/9), as opposed to *bösartig* (*vicious*)
Target 1: lieb (*charming*)
Target 2: artig (*well-behaved*)

(A.16)
Attempt: wöre (oral, grade 8/9)
Target 1: wäre (*(as if sthg/sbdy) were*)
Target 2: würde (*should/would*)

(A.17)
Attempt: anscheinbar (oral, grade 9/10)
Target 1: scheinbar (*apparently*)
Target 2: anscheinend (*apparently*)

Syntax blends:

The following seventeen items are meaning blends with concurring surface structures. One of the targets is a morphologically or syntactically complex verbform, mostly a particle or prefix verb. Striking observations, such as similarities with Spanish syntax and inter- or intralingual lexical distractors, are specified.

Syntax blends in grade 5/6 (4 items):

(A.18)
Attempt: <Am nächsten morgen kam T. zur Schule etwas nerwös an.>
Target 1: Am nächsten morgen kam T. etwas nervös zur Schule.
(*The next morning T. came to school nervously*)
Target 2: Am nächsten morgen kam T. etwas nervös in der Schule an.
(*The next morning T. arrived at school nervously)*

In this error, two alternative constructions, one with the verb *kommen,* the other with the verb *ankommen* were fused.

The result of the fusion is a maximal or over-inclusive construction. In Spanish, where A.'s proficiency was more advanced, he would have been able to generate such a complex structure correctly. The next two blends are further candidates where Spanish proficiency and/or transfer from Spanish had some impact. In the same grade D. used two constructions with *ankommen* correctly in his essays, such as <... damit sie sehen ob Feinde ankommen.> (... *to see, if enimies arrive*). Indeed both sentences were without local modification, i.e. less complex than (A.18).

(A.19)
Attempt: <Zebras sind nicht im Sterben gefährdet.>
Target 1: Zebras sind nicht gefährdet. (*Zebras are not endangered*)
Target 2: Zebras sind nicht vom Aussterben bedroht.
(*Zebras are not threatened with extinction*)
Possible distractor: *im Sterben liegen* (*to be in extremis*)

This error could have been the result of various lexical factors. The German words *gefährdet* and *bedroht* both have the Spanish translation *amenazado* (*endangered*). Again, the Spanish translation for the German expression *vom Aussterben bedroht* is *en peligro de desaparición* (*endangered with extinction*), not even containing the

word *amenazado*. The German expression *vom Aussterben bedroht sein* is lexically demanding and did not yet form part of the boy's active phrase lexicon in grade 5/6.

(A.20)
Attempt: <Sie unternehmen ein sehr enger Zusammenhalt>
Target: Sie unterhalten einen sehr engen Zusammenhalt.
(*They maintain (a) very close contact and cooperation*)
Possible distractors: *unternehmen* (*to undertake*), *entretener* (Spanish *to entertain*)

Seemingly, A. tried to employ an elaborated construction here and reached lexical competence limits. He lacked an idiomatic and synsemantic verb to complete his sentence. The use of a function-verb construction with an abstract noun (nominal style) highlights A.'s effort to express himself in a way, typical of written style and technical jargons. The use of *unternehmen* may have been the result of an activation process of various intralingual lexical competitors, such as *zusammenhalten* (*to stick together*) and the homonymous *unterhalten* (*to support*, *entertain*, *converse*/*talk*), or it was a translation attempt from the Spanish equivalents *mantener*, *entretener*, *conversar*. So, possibly, A. made local use of transfer as a productive strategy to achieve an advanced vocabulary in L2. For a certain acquisition stage lexical transfer may be a successful strategy in the formation of L2 vocabulary. In a later acquisition stage transfer has to be replaced by language-specific strategies of word formation.

(A.21)
Attempt: <guck mal in meiner Tasche>
Target 1: Guck mal in meine Tasche. (*look into my bag*)
Target 2: Guck mal in meiner Tasche nach. (*check inside of my bag*)

An alternative cause for this error may have been the home dialect or a (spoken) child variety where *nach* is left out.

Syntax blends in grade 6/7:
-

Syntax blends in grade 7/8 (5 items):

(A.22)
Attempt: <Dort denkt er viel an seiner Blindheit nach.>
Target 1: Dort denkt er viel über seine Blindheit nach.
(*There he thinks much about his blindness*)
Target 2: Dort denkt er viel an seine Blindheit.
(*There he thinks much of his blindness*)

A. produced another token of the false construction *nachdenken an* orally in grade 8/9: [Wenn man nicht viel daran (darüber) nachdenkt] (*If one does not think much about it*). Note, however, that in the draft lines of the essay where he produced (A.22), he used a "target 1" construction, <... wo er viel über seiner (seine) Blindheit nachdenkt>, and in an essay from grade 9/10 he used a "target 2" construction, <... hat seit der Wette hauptsächlich an dieser (diese) gedacht.> (... *had thought mainly of it since the bet*).

(A.23)
Attempt: <Auf dem vor uns vorliegendem Bild ...>
Target 1: Auf dem vor uns liegenden Bild ...
(*On the picture lying in front of us ...*)
Target 2: Auf dem uns vorliegenden Bild ...
(*On the picture being on hand ...*)

(A.24)
Attempt: <Der Mund ist zugeschlossen>
Target 1: Der Mund ist geschlossen.
Target 2: Der Mund ist zu.

Both target expressions mean *The mouth is closed*. The attempt would mean something like *The mouth is locked*.

(A.25)
Attempt: <Sie haben Zweifeln>
Target 1: Sie haben Zweifel. (*they have doubts*)
Target 2: Sie zweifeln. (*they doubt*)

A. produced this error in a draft. A misused plural marker would be an alternative explanation for this error.

(A.26)
Attempt: <Dort wartet er bis x und y vom Kindergarten rauskommen.>
Target 1: Dort wartet er bis x und y aus dem Kindergarten rauskommen.
(*There he waits, until x and y come out of the kindergarten*)
Target 2: Dort wartet er bis x und y vom Kindergarten kommen.
(*There he waits, until x and y come from the kindergarten*)

Syntax blends in grade 8/9 (4 items):

(A.27)
Attempt: <Nachdem sich A. bessert ... >
Target 1: Nachdem sich A. besser fühlt ... (*after A. feels better ...*)
Target 2: Nachdem sich A.'s Zustand bessert ... (*after A.'s state gets better ...*)

The attempt's meaning *after A. is improving* did not fit in the essay context.

(A.28)
Attempt: <Auch M. ist zu bedanken.>
Target 1: Auch M. ist zu danken. (*M. is to be thanked, too*)
Target 2: Auch hat man sich bei M. zu bedanken. (*It has to be said thank you to M., too*)

(A.29)
Attempt: <und das kann ich F. danken>
Target 1: und dafür kann ich F. danken (*and I can thank F. for this*)
Target 2: und das habe ich F. zu verdanken (*and it is F. I have to owe it*)

In formal language use, such as in an oration, the attempt would be well-formed, whereas the mastery of such a construction in a 14-year old is not probable. Besides in the context - the task was to write a diary entry of an adolescent - the use of a formal register is unsuitable.

(A.30)
Attempt: [er hat es zu mir erzählt]
Target 1: Er hat es mir erzählt. (*he told it to me*)
Target 2: Er hat es mir / zu mir gesagt. (*he said it to me*)

As (A.31) below this error was oral. In Spanish, *decir* and *contar* require the same constructions with *a*: *Él me lo ha dicho/contado a mi*. In German, *sagen* allows two constructions (*mir* or *zu mir*). By analogy A. extended this possibility to *erzählen*, which in standard German only allows the simple dative.

Syntax blends in grade 9/10 (5 items):

(A.31)
Attempt: [A. heiratet mit B.]
Target 1: A. heiratet B. (*A. marries B.*)
Target 2: A. verheiratet sich mit B. (*A gets married with B.*)

In Spanish only the possibility with preposition exists: *A.* se *casa con B*.

(A.32)
Attempt: <Wenn ihr euch über die Serie A interessiert ... >
Target 1: Wenn ihr euch für die "Serie A" interessiert ...
Target 2: Wenn ihr an der "Serie A" interessiert seid ...
(Both targets mean: *If you are interested in the "Serie A" ...*)
Target 3: Wenn euch die "Serie A" interessiert ... (*If the "Serie A" interests you ...*)
Possible distractor: sich informieren über (*to inform oneself of*)

A. produced this error in a draft. In an essay from grade 7/8 he used a "target 3" construction: <..., dass Fußball ihm (ihn) nicht interessiert> (*... that football does not interest him*)

(A.33)
Attempt: <Die Gruppe, die ich am liebsten zuhöre ... >
Target 1: Die Gruppe, der ich am liebsten zuhöre ... (*the band, I like to listen to the most ...*)
Target 2: Die Gruppe, die ich am liebsten höre ... (*the band, I like to hear the most ...*)

A. produced this error in a draft.

(A.34)
Attempt: <E. ist in einem Unfall und einer Fahrerflucht beteiligt. ... E. und ein Fahrradfahrer sind in der Handlung beteiligt.>
Targets: E. ist in einen Unfall ... verwickelt. ... E. und ein Fahrradfahrer sind an der Handlung beteiligt.
(*E. is entangeled in an accident. ... E. and a cyclist participate in the action.*)
Target constructions: in etwas verwickelt sein (*to be entangled in something*)
an etwas beteiligt sein (*to participate in something*)

(A.35)
Attempt: <um sich an den Problemen der Zukunft dran zu gewöhnen>
Target 1: um sich an die Probleme der Zukunft zu gewöhnen
(*to get accustomed to the problems of the future*)
Target 2: um sich daran zu gewöhnen (*to get used to it*)

Another possibility for this error would be the use of a deviant verb construction **drankommen an*.

Twenty-one out of the twenty-six tabulated meaning blends produced by A. not only share similarity in target meaning, but also in form[57]. Fifteen of them are syntax blends, which contain lexical entries with the same core meaning, such as in the attempt <Dort denkt er viel an seiner Blindheit nach> (error (A.22)):

*nach**denken** über* (*to think about*) + ***denken** an* (*to think of*) = *nach**denken** an*

Only three out of A.'s meaning blends led to existing lexical items, (A.20), (A.24) and (A.27), where words' meanings differ notably from the intended ones (*undertake* vs *maintain*, *closed* vs *locked* and *feeling better* vs *improve*). The majority of the meaning blends (eighteen items) are over-inclusive, i.e. they contain morphemes from two different constructions. For the syntax blends in question the underlying strategy can be imagined as the combination of two distinct constructions into one more complex construction (multi- or maximal construction). Leaving out a syntactical free or bound morpheme, or a lexical morpheme in (A.13, 15 and 19),

[57] The remaining five meaning blends are (A.13), (A.15), (A.20), (A.30) and (A.34).

would have led to correct sentences of the intended content or words of the intended meaning.

Another observation is that six of A.'s blends reoccurred in different exams, drafts or situations, which shows that not all of A.'s blends here are lapses. The six reoccurring errors were:

Target (target 1)	Distractor / target 2	Attempt
gemütlich (*comfortable*)	Mühe (*trouble*)	(A.5) gemühtlich (grade 5/6 & 6/7)
ziemlich (*quite*)	ziehen (*pull*)	(A.6) ziehmlich(er) (grade 7/8, 8/9 & 9/10). In grade 7/8 we find one correctly spelled token.
atmen (*to breath*) / Atem (*breath*)	Athmosphäre	(A.7) athmen / Athem (draft, grade 7/8)
Einwohner (*inhabitant*)	Bewohner (*inhabitant*)	(A.10) Einbewohner (grade 5/6 & oral, grade 8/9)
inmitten (*amongst*)	mitten drin (*in the middle of it*)	(A.11) im mittend (2 x) (grade 5/6)
nachdenken über (*to think about*)	denken an (*to think of*)	(A.22) nachdenken an (grade 7/8 & oral, grade 8/9)

A.'s meaning blends are not slips of the pen/tongue but errors triggered by competing patterns, not yet fully fixed in the language-learning process. Some of the blends produced by A. can only be understood as transfer phenomena.

7.5. Discussion

The appearance of blends provides evidence for the activation of concurring lexical entries and/or their syntax. Nearly all of the errors presented above concern morphologically complex lexical entries. Most of them not only are meaning blends but also show wordform overlaps between the targets, because both contain the same core lexeme. We are dealing with vocabulary and constructions that easily can be confused by a native adult speaker of German, if he/she is tired or distracted. In A.'s case, however, we are not dealing with lapses due to distraction, but to errors due to developmental factors. In many of the cases A. himself could not even decide whether he had produced an error or not. More than one half of all his blends concern verbs and their meaning nuances expressed in the syntax with the choice of prefixes, particles and prepositions, as well as the choice of the correct morphosyntax in case of conversions. In the following sections we will discuss

general and individual bilinguality impact on ...

- ... the considerable number of (meaning) blends in A.'s error sample, ...
- ... their quality, and ...
- ... A.'s effort to employ an elaborated, "academic" code in German, and the ambition to transmit information in a compressed mode, a mode, which led to various blends.

7.5.1. Bilingual patterns to build advanced vocabulary and constructions

The syntax-blend data suggest that constructional patterns were available but not clearly differentiated in the lexicon. Although A. knew the word-formation possibilities, it seems that he still proceeded from one verb, rather than two verbs of similar meaning. This state would be explainable in terms of learning phenomena, natural transition phenomena and retardation phenomena with less usual vocabulary.

One strategy, A. used in six items, is to build analogies to known, language-specific constructions:

- *Zeitraum* (*period*) in <Ortraum> (A.13).
- *in Wiklichkeit* (*in reality*) in <in ehrlichkeit> (A.14).
- *bösartig* (*vicious*) in <liebartig> (A.15).
- *unscheinbar* (*unconspicuous*) in <anscheinbar> (A.17).
- A structure like in *sich über etwas informieren* (*to inform oneself of something*) in <Wenn ihr euch über die Serie A interessiert ...> (A.32).
- The frequent word sequence *dran gewöhnen* (*get used to it*) or an analogy to particle verbs with homonymous prepositions or adverbs, such as *über den Fluss herübersetzen* (*to cross across the river*), *aus der Schule herauskommen* (*to come out of the school*), in <an den Problemen der Zukunft dran gewöhnen> (A.35).

In terms of Coseriu these errors conform to the system but deviate from the norm. They can be attributed to retrieval insecurities or even to the presence of vocabulary gaps, to a third possibility that the generation of an analogy was faster than the direct retrieval of a present lexical entry.

Local use of transfer and compositional analogies from Spanish probably

were involved in the six blends <in generell> (A.9), (A.18) - (A.20) and the spoken [Er hat es zu mir erzählt] (A.30) and [A. heiratet mit B.] (A.31). Indeed, an error like (A.30) also occurs in monolingual acquisition. In all West-European languages the syntactical principle to encode verbs of communication and thinking with a preposition is productive (*to say to*, *to think of* ...). The grammatical encoding of a recipient with *zu* is clearer than the equivalent possibility in German to encode a recipient with the dative marker, which may have had some impact in the production of an error, such as (A.30). Additionally, the tendency to encode animate complements with the dative marker, observed in A. as well as in E. (see 6.4.1. above), may have led to an inhibitory effect on the use of the dative for recipient marking. Thus it can be claimed that some of A.'s syntactical patterns were used in his three early languages. The variety of possible influencing factors shows that monocausal explanations (L1 influence or not) miss the point. Rather, an interaction of various productive morpho-syntactic patterns has to be assumed.

Taking a closer look at the syntax of the blends, we will try to get an idea of some of the underlying linguistic mechanisms: In the majority of the syntactical blends we can observe that the attempt contains the wrong, respectively a superfluous preposition. Examples are:

(A.31) attempt: heiraten mit

targets:	verheiraten **mit**	casarse **con**
	--- heiraten + Dir. Obj.	casarse (**con**)

(A.26) attempt: rauskommen von

targets:	rauskommen **aus**	salir **de**
	----- kommen **von**	venir **de**

While the targets in German are accompanied by different prepositions, respectively only one is accompanied by a preposition, the Spanish translations of the targets are both accompanied by a preposition, even by the same. Nine syntactic blends by A. share this pattern. Hence, in some of the attempts, such as (A.31), some direct influence from Spanish is quite probable. But in others, such as (A.26), evidence for other influential factors can be provided too. In seven of his syntactical blends the boy seemed to follow a simplistic pattern of only attaching a preposition or prefix to the basic verb without changing the argument structure (*rauskommen von*, *nachdenken an*, *vorliegen vor*, *ankommen zu* ...). These errors suggest that A. ignored that particle verbs and prefix verbs can have a different argument structure than the underlying verb. In many constructions he used the reduced inventory of idiomatic prepositions, such as in example (A.26) above where he provides the

German construction with *von*, a basic analogy to Spanish *de*. The advanced analogies were not yet part of his competence in German, due to an acquisition delay, or he fell back to beginner strategies, due to uncertainty. In sum, the interaction of the following productive patterns can explain the quality of his blends:

1. Out of various German constructions, the one was used that A. knew from Spanish.
2. He translated or transferred lemma features from Spanish, if the German word or structure was not present.
3. Within German (L 2) he used composite structures (multi-constructions), based on several different constructions he had encountered, as well as basic structures, ignoring the more complex ones. Constructional patterns were not clearly differentiated in the lexicon for low frequency vocabulary.

The three strategies, filtered from the analysis of blends, give insights into organisational processes of A.'s abilities in both languages.The data suggest that analogies were used from the bilingual's other language, from the language in use and that interlingual productive patterns were employed. While the phase of (pattern) transfer is relatively short in second language acquisition (SLA), it can last longer in simultaneous acquisition of two languages. In simultaneous language acquisition in a multilingual environment intra- and inter-language transfer are natural learning an communication strategies. Under multilingual conditions a learner may acquire the systems of his languages with relative speed, if the system share meaning and construction patterns. But the acquisition of the norms, determining choice among these patterns, requires additional time and attention. The fact that behind his attempts the correct targets already got "visible" shows that at the end of the survey A. was not so far from the language-specific and norm-adequate use.

7.5.2. Individual characteristics of multilinguality and their impact on lexical storing

From his language-background scales we know that most of A.'s contact with German was with adults. Especially the language contact with the oral narrative German variety of his grandfather until the age of eleven appeared to be a crucial source for early exposure to German. It can be expected that grandpa not only

employed more idioms, set-phrases and proverbs than A.'s mother or his teachers, but also that for A. this language contact predominantly was receptive. Although A. captured the meaning of the complex expressions from the narrations easily, being interested in the stories' content and because of the high degree of redundancy of the frequently repeated phraseologisms, he had difficulties to consolidate the corresponding lexical entries, due to their number and their formal complexity. At a relatively early stage he had to integrate lexical entries, which normally appear later in the acquisition sequence. The resulting active-vocabulary deficits showed up in attempts where not-established forms were mixed together, such as in the attempt (A.19) the items *gefährdet sein* (*to be endangered*), *im Sterben liegen* (*to be in extremis*) and *vom Aussterben bedroht sein* (*to be critically endangered*).

It is not likely that he stored blends in his mental lexicon, but the narrative and receptive conversation setting with his grandfather may have favoured a holistic storing strategy. The resulting "vague" representations lacked precise morpho-syntactical information (lemma information), such as argument structures. This not only explains the number of blends and their relatively long persistence, but also why his peer E. rarely produced blends in his essays. Teacher- and caretaker-pupil conversation is more adapted to the needs and to the competence of the child than the described early, demanding language input.

The early exposure to adult German may also have had positive impact on A.'s lexicon development. Indeed, his courageous strategy to use words, he did not have command of entirely, led to the described blends, but it also encouraged the enrichment of his active vocabulary. For example in the last essay of the survey, A. used sixteen particle-verb or prefix-verb constructions (such as *untersuchen* (*examine*), *überfahren werden von* (*be run over by*), *mitbringen* (*bring along*)), E. only seven, while both essays had approximately the same length. Indirect evidence for A.'s use of a more advanced vocabulary can be provided by the observation that from the many morphologically complex targets of A.'s blend data, his peer D. only used two throughout the whole survey. It seems that D. used easy, ready-made structures, ignoring the difficult ones. This may be interpreted as the result of a simplification strategy, also typical in L2 acquisition, which D. used and A. avoided.

7.6. Conclusions

Blends uncover language-specific limits of analogies and the blends, produced by A., provide evidence for the fact that his development of the use of the correct alternative (norm) in language lagged behind the norms of monolingual peers, as well as that syntactic categories in German were not entirely watertight. Some evidence for local transfer of Spanish constructions, when German ones were not available, was provided, as well as for an overgeneralised use of specific schemes, possible in Spanish and German, and language-specific analogies from familiar vocabulary of German. A. prestructured complex verbs with similar syntax on the basis of a joint grammar, conceivable as a general syntax of West-European languages. We can conclude that his lexical and syntactical competence was partly language specific and partly mixed. In comparison with D., A. used more transfer of joint lemma information and translations of morphologically complex words from Spanish. These strategies encouraged his vocabulary- and syntax development. A.'s strategy of holistic storing was amplified by early receptive exposure to an adult variety, his uncertainty in German by a competition situation with his more proficient older sister, whose error index in German essays was always better than the one of our participant. In sum our data provide evidence for a holistic ability in multilinguals to generalise linguistic schemes, valid for both languages, which is explainable in terms of an economic self-organisation of the language areas of the brain. If shared features really exist, this again provides evidence for the existence of one word store instead of two for both languages, in which language-specific and non-language-specific information is stored side by side. Transfer on the grammatical level showed up in the tendencies to avoid gender ambiguity, and to overgeneralise the marking of animate objects by the dative.

Holistic transcription and decoding, as well as levelling phenomena and shallow writing accompanied A.'s alphabetisation. In literacy acquisition A. began early to directly rely on word images. The appearance of "orthographic" blends (A.4 - 8) and word substitutions in reading, still visible in grade 8, as well as a striking number of segmental slips in grade 5/6, were due to this tendency, which led to an avoidance of sublexical processing. The consequence of the lack in double checking were the faster activation of orthographically known words (retrieval carelessness) and occasional grapheme errors. As we have found deficits in analytic processing in three of our four participants, 8.2. below presents a categorisation of all potential holistic processing slips, produced by our Spanish-German participants J., D. and A., and a comparison between monolingual and bilingual analytic-processing quality

in the transcription process.
The sudden increase of spelling accuracy in grade 7 can be described as a threshold phenomenon: The overcoming of the temporary delay in the acquisiton process of German orthography, also observed in D. since grade 8/9. At this stage their exposure to German texts led to a substantial improvement in reading and writing. It is true that they passed the threshold somewhat later than their monolingual peers, understandably so since they had spent much less time on German.

8. General Conclusions

8.1. Summary of evidence for bilingual strategies in the development of written standard German in Spanish-German bilinguals

8.1.1. Reliance on major rules

Some of the observed difficulties, the participants of this study had, can be linked to the circumstances that less exposure in each language can lead to a lack of opportunity to actually appreciate differences, and that the temporary overload with two languages can lead to a search for simple and general rules. Error-prone are ambiguous (homonymous) linguistic entities and entities of relatively low frequency, as well as grammatical categories, which have to be set off against each other (inflexion) and of course minor rules. Minor-rule delay was observed in the first case study where confusion in the spelling of German and Spanish stops was described. Allophones for certain phonetic contexts were not yet acquired by the nine-year old participant Jorge. When alphabetisation began, his phonological representations of stops were underspecified and not sufficient for writing purposes. Such phenomena can be superposed by other factors, such as speeded-up reading, which leads to vague orthographic representations.

In the older participants such clear occurrences of minor-rule delay were less conspicuous. For them possible exemplars of minor-rule delay are conjugation errors due to rule conflicts:

- *man weißt nicht* instead of *man weiß nicht* (*one does not know*), (E., grade 8/9).
  In German main verbs, 3. person singular forms in the present tense are marked with word-final *t*. The verb *wissen*, however, follows the pattern of modal verbs (*will* (*wants*), etc.).
- *haltet sich an den Plan* instead of *hält sich an den Plan* (*keeps to the plan*) (E., grade 7/8).
  For standard German verbs whose stem ends in *-t* the regular pattern in the present tense is exemplified by *ich falte - er faltet* (*I fold - he folds*). Many irregular verbs contract the *-t* of the stem and the *-t* of the ending and show vowel mutation: *ich halte - er hält* (*I hold - he holds*)

Minor-rule delay and the tendency in bilinguals to rely strongly on holistic processing (see 8.2. below), both, can proceed without transfer and interference. In levelling, on the other hand, transfer and interference are essentially.

8.1.2. Levelling and interference

Distinctions, relevant only in one of the two languages tend to be learned late, because they receive less attention and because they require a construction of a language-specific base. Until then they are treated as if they were joint structures. It can be argued that levelling enhances a speedy language development at early stages of bilingual acquisition, and leads to characteristic temporary competence errors, until the language-specific differences are learned. The data of this study show that what at one stage was a competence deficit, may at a later stage turn up as an interference, or as a reoccurring context-sensitive insecurity (insufficient habitualisation). A special case of levelling is transfer of linguistic entities, such as morphemes and rules from L 1. Transfer in early bilinguals is interpreted in terms of language dominance and acquisition order (Genese & Nicoladis 2007, 326 f). Structures, already acquired in one language, are also used in the other language. In the beginning, transfer is a productive transitory strategy to fill gaps in the communicative repertory. At a later stage such transfers can intrude as occasional borrowings, when available lexical items are not activated fast enough in the target language.

In this study we have found the following system constellations of Spanish and German to be error-prone to levelling phenomena:

		Spanish	German
Processing modes	- Syllable-timed processing	+	-
	- Phonological writing principle	+	-
Equidistant phonetic features	- Long/short vowel phonemes	-	+
	- Unstressed/stressed short vowels	-	+
	- Unvoiced/voiced *s*	-	+
Grammatical markers	- Homonymy of endings	Rare	Frequent
	- Animacy marker	+	-
Morphosyntax	- Derived verbs	Frequent	Very frequent
Lexicon	Polysemous words in one language correspond to groups of (synonymous) words in the other language.		
Concepts	Compound representations where coordinate representations are required		

Table 8.1: Levelling phenomena produced by Spanish-German school children, detected via an error analysis of written texts.

The use of both languages in everyday life supports levelling. Werner Leopold claims that the preference for common features originates from the effort to organise one single system for both languages. Thus, a transitional variety develops, which is also characterised by intensive borrowing on the lexical level, as well as by an overuse of syntactical structures possible in both languages, and norm-deviant analogies to existing structures (*liebartig* instead of *lieb* (*charming*), analogy to *bösartig* (*vicious*), etc.).

Bilinguality strategies, found in our Spanish-German participants, confirm general acquisition principles for simultaneous bilinguality:

- Bilinguals acquire joint structures.
- Initial joint structures are then slowly separated.
- All the languages of the environment influence all the individual's languages.
- Difficult words and constructions create problems in the weaker language(s), which may lead to avoidance, frustration, or success.

Bilingual cognitive factors play a major role in the acquisition, organisation and performance in both of the bilingual's languages. In advanced adolescent bilinguals,

as our participants Elias, Daniel and Albert, levelling phenomena can still be present as competence phenomena, or habitualised context-sensitive insecurities, or they can show up as slips. It depends on the individual developmental history and features, such as inter-learner and intra-learner variation[58], which of the described phenomena are more involved and which less, as well as how the influence will proceed, and for how long. That is to say that the influencing force of bilingual acquisition patterns and bilingual strategies strongly varies individually. Individual variation was demonstrated in the 5-year case studies by Kielhöfer & Jonekeit (1983), who describe the French-German development of two brothers. One of the brothers (Jens) accepted mixing, the other (Olivier) did not, Jens' French pronunciation and intonation was more advanced than Olivier's, etc. Our concern was to portray a part of bilingual potential, not to narrow the description of bilingual progress by using monolingual yardsticks to measure it. In 8.4.3. some resulting suggestions for the school environment will be presented.

8.2. Analytic processing in bilingual literacy acquisition

Three out of four participants produced a striking number of (word) substitutions or characteristic changes in the letter sequence (see 4.1.2., 4.2., 4.3., 5.2.1., 5.2.4., 5.3.1., 7.1.2., 7.2. above):

- In grades 3 and 4, J. tended towards orientation on the voice feature of the preceding sound, when stop discrimination failed, such as in <salian dodos> instead of <salían todos> (*all came out*) (19 items).
- In the period grade 5 to grade 8, D.'s lexical retrieval failed even when pronunciation between target and attempt mostly, and in some cases clearly, differed, as in <hervorderung> instead of <Herausforderung> (*challenge*) (18 items). From A., 11 retrieval errors in writing (grade 5/6) and 3 in reading (grade 8/9) are documented, such as [dispersa] (*diffuse*) instead of *despensa* (*store*). J. produced three retrieval errors in reading (grade 3), such as *blusa* (*blouse*) instead of *bolsa* (*bag*).
- D., A. and J., deviated from segmental order, as in <Zchist> instead of <zischt> (*hiss*). J. produced 22 such items in reading or writing, most

[58] Intra-learner variation refers to the grade of proficiency of an individual in different cognitive and communicative functions, such as oral narrative, oral interview and spontaneous conversation (see James 2007).

of them in grade 3, D. produced 9 items in the period grade 5 to grade 8, and A. produced 8 items in grade 5/6.

All these errors suggest absence of sufficient analytic control in reading and writing at different stages of alphabetisation. At an earlier stage this deficit may be due to a lack of discriminatory control of the position of a phonetic feature or speech sound. Later it is due to an (occasional) insufficient activation of segmental control in the reading, writing, or rereading process. It can be argued that both patterns are the consequence, or at least are favoured by an overreliance on holistic strategies. In 2.4.4. we have seen that isolated holistic processing speeds up the recognition of frequent (orthographic) representations, but at the same time, that too early introduction of holistic strategies in alphabetisation can cause delays in the building of an inventory of fully specified complex orthographic representations (competence problems). At an advanced alphabetisation stage, processing slips can occur, when holistic "routines" intrude on the reading and writing process. To reduce the appearance of retrieval errors a more detailed analysis in visual perception as well as phonemic control in writing are necessary.

In 2.4.4. we also have argued that very early introduction of holistic strategies is a bilingual acquisition strategy. Our hypothesis was that because of more reliance on holistic processing, analytic processing is underrepresented in a transitory phase of bilingual alphabetisation. If the errors presented above were triggered by holistic processing, this would be evidence for our hypothesis. Hence, in the following we try to show that monolingual spelling data differs with respect to phonemic-control errors, i.e. that monolinguals produce less of them in a comparable task. To check the assumption, as well as to find more evidence for "weak" phonemic processing in writing by bilinguals, number and quality of errors in a pseudoword-dictation task, produced by a bilingual sample and monolingual controls, were compared. Semantic-based processing is not possible in pseudoword spelling, or to identify a new word. For both tasks a more successful strategy is to rely on phonemic segmentation and phoneme order. The bilingual participants were 11 early bilinguals from grade 3 to grade 9, all with more-or-less severe problems in the written modalities and 6 bilingual pupils without problems. All were simultaneously alphabetised in two languages, 3 in German and English and 14 in Spanish and German. Their spelling performance of 11 pseudowords[59] was compared with the

[59] The 11 pseudowords are: *dalo*, *strendo*, *rami*, *fip*, *nosti*, *oplis*, *panfilteus*, *promechto*, *fanena*, *pflaunkras*, *heimobond*
Pseudowords and pseudoword-dictation task are presented in Wimmer (1993). Wimmer's scoring procedure was as follows:

one of grade 2 to grade 4 German monolingual dyslexics, presented by Wimmer (1993)[60]. Table 8.2 shows the results.

	Grade 2	Grade 3	Grade 4	Grade 6/7	Grade 8/9
Bilingual poor readers	-	6 (n = 2)	4 (n = 3)	3 (n = 4) 0,3 (n = 6 normal readers)	2 (n = 2)
Controls, monolingual dyslexics	4,1 (n = 23)	2,3 (n = 22)	1,6 (n = 29) 1,0 (n = 41 normal readers)	-	-

Table 8.2: Means of errors produced in a pseudoword-spelling task by Spanish/English-German poor readers and a control group of monolingual dyslexics, and by bi- and monolingual normally progressing readers. Control-group data of monolinguals is taken from Wimmer (1993, 18, table 3). Participant number (n) is given in parenthesis. For test description see footnote 59.

The reliability of the compared data in table 8.2 has to be judged with the following qualifications:

- Small size of our observation sample.
- Subject characteristics:
  While subjects of both samples have a normal or high IQ and are significantly slow readers, dyslexics in Wimmer's study progressed normally in arithmetic. Our sample is not controlled for performance in maths.
- Method:
  In our study, participants were instructed to write the pseudowords as if they were German words. For many items one or even more repetitions were asked for by participants, and given by the experimenter.

The mean value of all errors produced by the 11 bilingual poor readers is "3,6 errors", with a grade mean of "grade 5". The error mean is similar to the one, the control group achieved in grade 2, i.e. three years earlier. A second striking

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"A score of 0 for a spelling indicates the appropriate transcription of a word. An error point was given when a phoneme was wrongly represented, deleted, or represented at an incorrect position, or when a phoneme was added [...I]t was considered correct when unvoiced stop consonants were represented by graphemes normally standing for voiced stops (e.g. *bromechto* for *promechto*) or when phonetically similar vowel sounds (/e/ - /i/ or /o/ - /u/) were confused." (Wimmer 1993, 8 f)

[60] Wimmer (1993) gives a detailed description of the dyslexic subjects on pages 11 ff.

observation is, that accuracy distance in pseudoword spelling is bigger between bilingual poor and normal readers (in grade 6/7) than between monolingual poor and normal readers (in grade 4).
Turning to a rough qualitative comparison, in the error data of our sample some real words were produced, such as <hinboton> (Spanish *botón* means *button*) instead of *heimobond*, <darlo> (Spanish *darlo* means *take it for*) instead of *dalo*, <Pflaumkras> (German *Pflaume* means *plum*) instead of *pflaunkras*. In Wimmer's study nothing is mentioned about the appearance of real-word responses.

The clearly differing results between our Spanish/English-German poor readers and Wimmer's German dyslexics in a pseudoword-spelling task are explainable by differences in the use of analytic strategies for writing purposes. While monolingual dyslexics seem to strongly rely on underlying phonemes and their order, bilingual poor readers seem to rely more strongly on holistic processing. The use of an inadequate strategy for pseudoword spelling, again, suggests that the development of analytic literacy strategies is delayed in bilingual but not in monolingual poor readers. Partly, this is explainable in terms of a bilingual preference to rely on underspecified perception, i.e. feature perception, when alphabetisation begins, a strategy that favours a fast access to meanings, but may at the same time decrease the use of phonemically mediated word recognition. An early meaning-orientated strategy in reading gives rise to an early reliance on top-down constraints, i.e. holistic processing. Accordingly, less attention to phoneme discrimination and to speech-sound or letter order is the consequence at an early alphabetisation stage, leading to substitutions, anticipations, exchanges (inversions, permutations), or perseverations, such as syllable assimilation. In higher school grades misguided lexical retrieval where pronunciation differs and coarticulation errors in morphologically complex words were considered as possible additional late consequences of early meaning-orientated strategies in literacy. Hence, insufficient phonemic awareness, as well as insufficient double checking may be due to early bilingual holistic processing preference and perception economy. If these considerations are valid, our hypothesis is confirmed, that in a transitory phase, analytic processing is underrepresented in alphabetisation of bilinguals, who more than monolinguals rely on holistic processing before full alphabetisation. In addition we can conclude that in bilingual poor readers ...

- ... less experience with the written language in speaking and writing exists.
- ... holistic processing slows down the development of analytic

strategies in alphabetisation.

Finally, we want to solve an apparent contradiction between our finding that phonemic processing is underrepresented in an early transitory phase of bilingual alphabetisation and other findings about early bilingual advantages in phonological awareness. Phonological awareness is an important predictor for later success in learning to read, "because it is considered to be central ... for word decoding" (Wimmer 1993, 5). Perfetti et al. (2001, 138) specify that of all phonological sensitivity skills "the child's phonemic awareness, the understanding (more-or-less explicit) that the speech stream can be segmented into a set of meaningless units (phonemes) [...] shows a strong correlation with early reading success [...]". Various studies have shown certain phonological sensitivity advantage of bilinguals at kindergarten and in early elementary school (Oller & Cobo-Lewis 2002, 274 f). Early phonological awareness is due to the need to separate phonological systems of both languages, which already proceeds before age three in bilingual first-language acquisition (Galles & Kroll 2003, 281). Note, however, that segmental awareness is not one of the bilinguals' phonological-awareness advantages. It is the result of learning to read in a phonics method, and a developed segmental awareness in early literacy, again, favours development of alphabetisation (Alegria & Morais (1991, 144 f), Perfetti et al. (1987)) by improving and automatising the conversion system, and thus establishing the access to the orthographic code (Alegria & Morais 1991, 137). Various different forms of phonological awareness can be assumed, of which some "are causes of reading and others caused by it" (Bryant & Goswami 1987, 239). This explains the possibility that in some of them an early bilingual advantage and in others an early bilingual disadvantage may exist.

We can conclude that very early developed semantic-based perception in bilinguals accounts for strong reliance on holistic processing. Holistic processing bypasses the perception of phonemic features and phonographic correspondences. That is why reliance on holistic devices must not occur prematurely in literacy acquisition. The differences between early monolingual and bilingual literacy processing may root in an earlier and stronger separation between concepts and language in bilinguals, whose thinking is more language independent than in monolinguals. Analogous, written words are directly stored as images or texts, not as grapheme strings. These assumptions trace back on conclusions by Werner Leopold, who maintains that language is not necessarily involved in thinking. Language would only be one of several possibilities of thought and bilingual development - per definition not confined to one language - would favour an

exchangeability of the code, used for thinking. A probable significant delay in establishing an automatised and sophisticated conversion system in bilingual poor readers is explainable in terms of an overreliance on holistic processing. Poor monolingual readers do not experience such difficulties, because they do not rely excessively on holistic processing. Normal bilingual readers reach the threshold of orthographic accuracy earlier than bilingual poor readers.

A promising approach for bilinguals to prevent temporary analytic-processing difficulties may be a reinforcement of phonemic processes, at least in the first two years of schooling. As a consequence alphabetisation thresholds may be reached sooner. A positive effect could be a decrease of cognitive effort in reading and writing processes. So the risk of secondary consequences also may decrease, such as a low motivation level in reading and writing, as observed in D. (see 5.1.1. above), or loss of confidence of one's own reading and writing skills. Both factors, sufficient motivation and self-esteem, are important parameters in language acquisition (Krashen 1986, 100). Reading fluency and experience, again, are fundamental predictors for successful learning. Their absence can create serious scholastic problems (Perfetti et al. (2001, 138), Wimmer (1993, 11)). Dominant bilinguals possibly rely too early on holistic processing, because in their stronger language they are already able to do so. This would explain orthography problems in one, but not in the other language(s) of a bilingual. Our qualitative analysis of analytic-processing errors gives insights into research questions 1. and 2. (see 3.1. above), if phonological skills and processing modes for written material are differently developed in bilinguals compared to monolinguals during the same stage of alphabetisation. Bilinguals seem to rely more strongly on holistic strategies before full alphabetisation than monolinguals. This preference can lead to a delay in the building of an inventory of fully specified complex orthographic representations and, at a later stage, may lead to problems with the automatisation of a balanced double-checking process. Future investigation is necessary to back or reject considerations about developmental differences of alphabetisation in bilinguals and monolinguals, as well as differences of bilingual and monolingual written-language processing, and to spell out the differences in detail. Insights could serve to calibrate methods in bilingual alphabetisation (see 8.4. below).

8.3. Conscious comparison as a method to improve orthographic accuracy in a Spanish-German poor reader

From grade five onwards, D. received lessons to improve his writing capacities. But only after the end of the error observation, bilingual factors were taken into account in this treatment. The main motivation to do so at this stage, were the boy's stable essay results, which allowed to trace new contents, designed to improve the transcription quality of the writing process in German. It was assumed that providing him with specific additional knowledge to enhance his linguistic awareness would have a beneficial rather than an overcharging impact. The decision was encouraged by the observation, that composition and transcription quality always increased when D. planned the macro stucturing, and, to a lesser extent, the micro structuring of his texts. The new strategies, developed with the learner and condensed as self-instructions, were included around the beginning of the second half of grade eight, and are described in the following paragraphs.

8.3.1. Description of the comparative interventions

Morphological principle:
First and foremost, the aim of one of the interventions was to habitualise the use of a lemma strategy in writing. A lemma or lexical entry can be thought of as a number of wordforms, belonging to the same lexical paradigm and differing in their grammatical categories, only (Eisenberg 1994, 35). In D.'s survey, lemma membership of wordforms was not assured. No reliance on paradigms (<helt> instead of <hält> (*holds*), etc.) or occasional reliance on inappropriate word paradigms (*spinnen* (*spin*) in the nonce mistake <Gespennst> instead of <Gespenst> (*ghost*), etc.) were two consequences of this insecurity. A comparative setting was chosen to improve the deficits, as the Spanish writing system relies more on phonology than the German writing system, while the deeper German writing system relies more on underlying lexical orthographic representations (see 2.4.3. above). It was supposed that (in the long run) conscious monitoring on the orthographic representation of the lemma could support the habitualisation of a morphological retrieval strategy. So, importance of morphological consistency in German spelling was demonstrated to the boy, and contrasted with the phonological principle in Spanish orthography. It was highlighted that for accuracy in German spelling, it is more important to rely on word images than it is in Spanish spelling. It

was assumed, that monitoring with the mediated portions of linguistic awareness about the differences between the underlying orthographic principles of Spanish and German could enable the boy to suppress shallow writing, overreliance on phonology and sublexical processing, i.e. the three factors, which prevent the direct retrieval of lexical orthographic representations and reliance on morphology.

Capitalisation:
Analysing the capitalisation errors in D.'s German exams, made clear that most of them were not connected with the simple fact of an orthographic system difference between Spanish (only proper names are spelled with initial upper case) and German (all nouns are capitalised). Rather, for the last two years of the survey capitalisation errors occurred in nominal phrases with adjectives and were due to the confusion of parts-of-speech in sentences. In 5.3.1. it was argued that the differing word order of adjectives and nouns in the Spanish compared with the German nominal phrase probably was levelled out by the boy. The unmarked case in Spanish is that the determiner immediately precedes the noun. The unmarked word order in German noun phrases is: Det (Adj) N. Nouns are even more difficult to recognise when they appear without the article as in predicate constructions, where adjectives and nouns can sometimes be distinguished clearly only, when a determiner is inserted (see 5.2.3. above).

The aim of the second intervention was to achieve a better morpho-syntactical awareness of the parts-of-speech "adjective" and "noun" in the nominal phrase, to distinguish them from each other and to identify the position of the noun within the structure of the nominal phrase itself with more certainty[61]. Again comparison was the chosen method. This time it was explained to the boy that the Spanish adjective follows the noun while in German it precedes. Thus, D. was provided with a reference point, which can easily be memorised and which, in case of trouble, can easily be handled by the conscious monitor. The aspect of simplicity of the instruction was especially important for D., who tended to spontaneous text production, without carrying out careful online planning, when feeling overcharged. The "catchy" instruction "First remember that in German nominal phrases the adjective precedes the noun" increased the possibility that he would apply this knowledge to recognise nouns in sentences, transforming it little by little into a habit. D. was provided with two further instructions. If the first would fail to decide

[61] Oral slips, such as *Bausatz* (*construction set*) instead of *Satzbau* (*word order*) (D., post survey), or *Feldspiel* (*field game*) instead of *Spielfeld* (*field*) (E., post survey (see the following case study)) illustrate that order insecurities occasionally also occurred in compounds where nucleus identification failed.

the part-of-speech of a word in a sentence, the second self-instruction "Remember that in German the last word in a nominal group normally is the noun" was available. This instruction focuses on the noun's position independently from the adjective, and therefore increases the possibility to recognise the nouns in a sentence. To identify single-word nominals, a third instruction was given "If you can insert a determiner before a word, it is a noun". In comparison with the first two, the third self-instruction demands the application of a syntactical procedure, i.e. a modification of the sentence. Hence, it might be more difficult to apply during transcription, compared with the first two instructions.

To practise, D. was provided with different exercises, as derivation, manipulation of sentences etc. All the exercises were designed in a way that D. had to apply capitalisation rules consciously, and that he had to get accustomed to the three instructions about capitalisation, while writing or checking his writing.

8.3.2. Results and discussion

The three essays after the survey, i.e. since the start of the second half of grade eight, form the comparative data base to observe the progress in orthography concerning the morphological principle and the capitalisation rules. Altogether, a significant decrease of orthographic errors was achieved in the post-survey essays (grade 8/9). After intervention, 4 - 5 % of the words produced in D.'s essays were misspelled. Before, this value was between 8 - 10 %. This is a 35 % to 50 % gain in orthographic accuracy within a couple of months, with one session of one hour weekly. Such a progress was not accomplished at the end of the preceding three years. What is also striking about the follow-up essays is the average increase of word number. This positive and fast development in the post-survey confirms that D.'s problems in the written modalities were not dyslexic.

It was expected that the significant improvement also was favoured by the method of conscious comparison. Other parameters, which could have had an impact, did not change notably since the end of the survey. The point of the significant decrease of spelling errors was in the middle of the school year. The teachers were the same, as well as D.'s exam preparations, his marks etc.

Progress in capitalisation:
Comparing the pre- and post-survey errors in capitalisation in quality and frequency various changes are visible:

(1) Misspelled upper case decreased significantly and capitalised adjectives in nominal phrases disappeared completely. We remember that in grade 7/8 capitalised adjectives in nominal phrases, such as <eine 22 Jährige Frau> instead of <eine 22-jährige Frau> (*a 22-year-old woman*), represented most of the upper-for-lower-case errors, and that all of them were derivations from nouns.
(2) In nominal phrases, containing a definite or an indefinite determiner, D. practically no longer produced any capitalisation errors[62].
(3) Lower case for upper case also decreased.

Remaining errors of type (1) were nonce mistakes and sporadical appearances of new mistakes, and errors due to insecurity, which show up in self-correction:

> <wie (weil) er Stolz[63] (stolz) sein konnte> (*because he could be proud*) - corrected from lower case to upper case.

In this last phase, new rules helped to avoid former mistakes but led to new mistakes. The concept of the part-of-speech "adjective" seems to be more accurately transferred to the sentence context and correct lower-case use in German adjectives was already becoming a habit in D.'s writing. The question arises, why a comparable progress is not visible for the upper-case application in nouns, which still accounts for the majority of orthographic errors in the post-survey.

A part of the answer probably is linked to the morpho-syntactical evolution in D.'s written mode of expression, for which the use of noun derivations from adjectives and verbs is a good example. In the survey, capitalisation errors in derivations, respectively conversions, grew constantly. Since grade 7/8 errors like <dieses konstante auslachen> instead of <dieses konstante Auslachen> (*this steady laughing at somebody*) represented one of the major sources for capitalisation errors. This trend cannot be explained in terms of a deterioration of internalised capitalisation rules. More likely is an increase in the employment of conversions and derivations as a lexical device for text composition, as the following statistical observation confirms:
A sample of four exams, one for each year, all narrative, were compared with

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62 Nominal phrases, which determiners are clitizised to a preceding preposition were not taken into account in this count (*im*, *zum* etc. (*in*, *to* etc. plus definite determiner in masculine/neuter, singular, dative)).
63 The noun *Stolz* is a conversion of the adjective *stolz* (*proud*).

respect to the number of conversions in nominal phrases. And indeed, conversions in essays increased by the ratio one to four. Additionally, we find an increasing number of nominal phrases lacking a determiner. So, the remaining orthographic errors can be attributed to increased grammatical complexity.

Unfortunately, constructions, resulting from the described morpho-syntactical development, were more error-prone for capitalisation errors than the already habitualised constructions with determiners and without conversions or derivates of adjectives or verbs. Also affected in the post-survey period are frequent noun-verb combinations in the verbal group of the sentence. In errors of the type <sich gedanken machen> instead of <sich Gedanken machen> (*to bother*), D. interpreted the noun, due to its strong relation with the semantically empty verb, as a part of the grammatical predicate.

While the boy's syntactical versatility in written speech evolved positively, the amount of lower-case errors in nouns was approximately constant. This connection may make clear, that his evolution in syntactical aspects of the composition was faster, by comparison with the evolution of the capacity to recognise nouns in newly acquired constructions. D. still had not habitualised the rules, that conversions and derivations of adjectives and verbs, as well as nouns in verbal phrases, are capitalised. Both rules, upper case after part-of-speech change and upper case in lexicalised verb-noun combinations belong to the difficult areas of capitalisation (see 5.2.3. above).

It can be concluded that the morpho-syntactical development uncovered slight deficits, i.e. minor-rule deficits, in the recognition of nouns in syntactical phrases, which were not overcome by the intervention on capitalisation. None-the less, the comparative method had a positive effect. This change suggests a progress in distinguishing adjectives from nouns in syntax as well as in word formation and a progress of awareness in word formation.

Progress in morphological consistency of written German wordforms:
To estimate the influence from the comparative treatment, all occurrences of the error types, violating the morphological principle (lemma errors), were counted. Table 8.3 illustrates their frequency in four years:

	Grade 5/6	Grade 6/7	Grade 7/8	Post survey
Number of written words	1435	724	1098	1212
Number of error types	133	63	85	56
Number of stem deviations	20 (15 % of all errors)	10 (16 % of all errors)	18 (21 % of all errors)	7 (12,5 % of all errors)

Table 8.3: Word-formation errors where the orthographic representation of the word stem was ignored (<Halz> instead of <Hals> (*neck*), etc.) in exams of a bilingual poor reader.

While in grade 7/8 every 61st word produced was a lemma error, in grade 8/9 (post survey) D. produced one only every 173rd word, and stem deviations now only accounted for 12,5 % of all errors. Three (out of seven) such word-formation errors are potential performance errors, i.e. very frequent near homophones and a nonce mistake: <wer> (*who*) instead of <wäre> (*it would be*), <fast> (*nearly*) instead of <befasst> (*deal with sthg*) and <enderte> instead of <änderte> (*changed*), a nonce mistake, containing the word *Ende* (*the end*).

8.3.3. Conclusions

The development, described here, suggests that the intervention based on spelling-principle comparison had an impact on the boy's accuracy in morphological consistency in German orthography. The comparative intervention enabled D. to become aware of the fact that two competing orthography principles exist and that each of them has its own domain. Reliance on internal representations is more appropriate for writing in German, while reliance on actual pronunciations is a principle especially useful in Spanish. This interlingual awareness helped D. to minimise word-formation errors significantly in a relatively short time span. The development can be interpreted in the way that the awareness of system differences have supported a retrieval strategy, preferable for both systems, especially for the German one. Before the comparative intervention, word-formation errors possibly were due to gaps in the orthographic lexicon, which are explainable in terms of an attempt to store a written representation for every wordform. Frequency effects of homophones and near homophones, as still observable in the post survey, are probably due to occasional holistic processing and may suggest the need for more

semantic control in the retrieval process of orthographic representations. Entities, such as irregular verbs (*kommen* (*come*) - *kam* (*came*), *vergessen* (*forget*) - *vergaß* (*forgot*)[64], etc.), which are better stored as two lexical entries, illustrate limitations of the lemma strategy.

Improvement of capitalisation was not as fast and a beneficial effect from a comparative treatment was relatively small. The most appropriate time to introduce instruction on capitalisation would have been the self-correction stage, after composition and transcription in essay-writing were firmly established. Here, conscious monitoring may be the first step to internalise and habitualise the application of a more refined set of capitalisation rules. It is also possible that a serial introduction of the capitalisation rules, would have been more helpful, i.e. less overcharging to the boy.

8.4. Concluding remarks on bilingual school education

8.4.1. Effects of conventional alphabetisation in bilingual schools

In the first two years of schooling, when correspondences between sounds and letters are taught, temporary bidirectional confusions with phoneme-grapheme and grapheme-phoneme correspondences occur in simultaneous alphabetisation. They are explainable in terms of a competence lack in a phase of learning the phonology-based principle of word decoding plus two language-specific graphemics and their correspondences to phonology. From grade three onwards these confusions disappear without (teacher) intervention. After basic literacy skills are consolidated, occasional inter-language confusions occur. Intrusions can be caused by execution or retrieval carelessness or by a transitory confusion in a period of intense foreign-language learning[65].

It can be concluded that temporary bidirectional confusions or occasional interference have no essential impact on literacy acquisition. Other bilinguality

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64 D. produced <vergass> in the post survey.

65 For example, an early consecutive German-English bilingual of our observation sample, dominant in German, who moved to Spain at the age of 11, produced Spanish-influenced errors in German:

- <lutchen> instead of <lutschen> (*to suck*).
- Unwillingly, but regularly he produced the Spanish alveolar approximant instead of one of the German variants of the *r*-phoneme, when talking in German.

factors have more essential impact on the way literacy is acquired and on the way written language is processed. The following three tendencies were confirmed by our error analysis of mainly written data between grades 3 and 9:

(1) Transfer on various linguistic levels (see 8.1.2. above).
(2) Early systematic gaps, due to levelling, show up as "additional" interference of more or less habitualised patterns at a later developmental stage (see 5.3.1. and 6.4.2 above).
(3) Too early reliance on holistic processing leads to an insufficient automatisation of the conversion system (see 8.2. above).

Tendencies (1) - (3) accompanied development and use of written standard German of our Spanish-German participants, who were alphabetised in the conventional simultaneous and separated way in Spanish and German. Especially (1) and (2) were observable on various linguistic levels at least until grade 9. It can not be excluded that the observed development was partly due to the fact that the educational staff did not take into account bilinguality factors, such as levelling or reliance on major rules and joint structures, in preschool and early school years.

8.4.2. Adaptability of alphabetisation methods in bilinguals

In this study two exemplary units were designed, which used the method of conscious comparison of systematic differences between the learner's languages. The units were integrated in the learning program of one participant and the learning effects were observed (see 8.3. above). The results of the interventions suggest that habitualised, overstated shallow writing in German was improved with relative ease, i.e. evidence was provided for the fact that a comparative learning setting can help learners to overcome insecurities, triggered by early bilingual levelling. All error sources, associated with bilingual acquisition mechanisms and a bilingual delay, could be subject to a local treatment, and each bilingual child could profit by early interventions, designed to minimise ...

- ... the level of cognitive extraload of bilingual language development and biliteracy acquisition.
- ... the risk of false habitualisations or even fossilisations.

Cognitive bilingual explanations / interventions introduced early on could start from error phenomena in the acquisition sequence, like the ones for Spanish-German bilinguals summarised in 8.1. and 8.2. above. Some of these interventions may be transformable into practice easily, even in the classroom, others may require a more sophisticated creation process. In any case a detailed set of interventions to ease developmental requirements in written standard German and written standard Spanish would be a useful instrument for Spanish-German educational institutions. The elaboration of such a tool, however, goes beyond the scope of this study. Future investigation will have to focus on ...

- ... the design of concrete teaching units, based on appropriate linguistic material, which is derived from insights of longitudinal studies, as the one presented here.
- ... the evaluation of (beneficial) effects of resulting "bilinguality" units.
- ... the systematisation of units according to acquisition stages, varying levels of difficulty, etc.

In 8.4.3. general recommendations are presented for professionals, involved in the alphabetisation of bilinguals, such as teachers at bilingual schools.

8.4.3. Recommendations

It is likely that in many bilingual schools, comparative methods are not established, because fear of interference, fossilisation of transfer, mixing, or borrowing exists. This fear is based on the prejudice that language contact impedes a satisfactory language separation. Indeed this fear is unfounded. Even if languages are taught in a separated way, like Spanish and German at DSM, Deutsche Schule Madrid (German School Madrid), pupils rely on transfer, because it is a natural strategy in early bilingual development. Linguistic research rejects a mixing approach, in which both languages are used in the classroom to transmit school content, for other reasons than language contact, namely because results of language-proficiency improvement are inferior compared to the separation method in bilingual schooling. "One reason is that children apparently learn to ignore the language they do not understand [so well, if] the same or a related, message is typically given in both languages" (Swain 1983, 42). However, a comparative approach has nothing to do with the method of using both languages for instruction in one and the same lesson. Comparative

interventions are designed to show and explain differences between languages (see 8.3. above). They can help to clarify difficult structural differences between the languages. Applied at an early acquisition stage, they may help to overcome temporary delay phenomena faster and with more ease. Otherwise, separation may take longer, as was observed in some levelling phenomena in this study. If the teaching staff at bilingual schools, tutors, parents and other persons involved in the language education of a bilingual child could recognise the following simple tendencies and transitional phenomena affecting literacy in multilingual acquisition, they would possibly change the attitude towards conscious comparison of systematic differences between the learner's languages, and other methods, which take into account bilingual acquisition strategies. If they would, practical strategic clues for the learning environment, for example in school, could arise.

- A temporary delay is normal in bilingual acquisition. Swain (1983, 41) points out that successful, i.e. native-like, language learning "takes time" in an immersion program. The benefits are proficiency in more than one language and an advantage in various cognitive faculties compared with monolinguals (Hamers & Blanc 2000, 89).

- Languages are stored side by side and not separated in bilinguals' brains. Consequently language contact can not entirely be suppressed by separating the languages (Kielhöfer & Jonekeit 1983, 69).

- The bilingual's language system contains language-specific and non-language-specific information, which can be used in a monolingual and interlingual way/mode.

- Joint structures are preferred.

- Transfer is a natural bilingual acquisition strategy.

- Especially norms, which do not conform with the system, are consolidated at a late stage in bilingual acquisition.

With respect to the alphabetisation process, the following clues could be helpful:

- Problems in literacy acquisition of bilinguals may be due to

developmental delays.

- Bilingual development favours an earlier reliance on holistic word retrieval, which may impede the automatisation of the conversion system during alphabetisation. A possible long-term consequence is insufficient double checking in reading and writing. Thus teachers should attach more importance to the consolidation and automatisation of the conversion system in bilingual literacy novices.

- Certain problems in literacy performance in the weaker language may be due to the use of processing modes, which are more appropriate in the stronger language.

8.4.4. Simultaneous vs consecutive alphabetisation

Initial reading instruction in two languages obliges first and second graders to learn the alphabetic principle of word recognition with the added burden to internalise more than one set of phoneme-grapheme correspondences and orthographic representations. Initial reading instruction in one language is proposed by Swain (1983, 39) as an effort-reducing alternative. She argues that literacy-related skills are not language specific. At least in languages, which use the same script, they are adaptable to a newly introduced writing system. The fact that "phonological awareness in one language predicts word-decoding abilities in the other" (Oller & Cobo-Lewis 2002, 258) may suggest that once alphabetised in one language, only new or different phonological features, phoneme-grapheme correspondences and orthographic principles have to be taught in the other language. An aspect in favour of consecutive alphabetisation at Spanish-German schools is the fact that both languages' orthographies use the same script and are situated at the shallower end of alphabetic writing systems. Thus, consecutive alphabetisation may minimise temporary overload in bilingual school education.

On the other hand simultaneous alphabetisation advances the awareness for differences between both writing systems, especially, if the learning institution guides the acquisition of error-prone system differences. So children are eased from the load to find the differences on their own, which is especially important for bilingual poor readers. This setting requires a bilingual staff, like in the successful educational system in Canada (see 1. above). Speeded-up alphabetisation progress

could be a resulting beneficial effect of a "bilinguality guided" alphabetisation approach.

Literacy acquisition of bilinguals requires an emphasised attention to automatisation of the conversion system before full alphabetisation (see 8.2. above), independently of the chosen method, i.e. simultaneous or consecutive. This is necessary to guarantee that a sufficient threshold in analytic processing is reached. In consecutive alphabetisation graphotaxis of the other language should be introduced only, when this threshold has been reached. In monolingual alphabetisation, consolidation of graphematic major rules is recommended before an introduction of minor rules (Eisenberg & Fuhrhop 2007, 18 f). This recommandation has to be adapted for bilingual alphabetisation where initial problems in literacy acquisition are due to a bilingual delay in acquiring minor rules, as well as certain realisations of phonemes, which are acquired later than in monolinguals. This accounts for transient phonetological deficits, which enhance holistic-processing activity and lead to an overgeneralisation of regular, frequent orthographic patterns. For Spanish and German this would mean that alphabetisation should start in Spanish and German should follow. In simultaneous instruction the obvious teaching strategy is to begin with joint phonographic correspondences and to introduce language-specific elements in structures as specific, in order to help learners to avoid blind alleys.

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