Pronouncing Anglicisms: On the difficulty experienced by English-dominant learners of German

by

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Content

1. Introduction

Since the 17th century, English has played an increasingly important role in Germany, becoming the country's dominant foreign language and influencing the German language to the extent that thousands of English words were borrowed over just four decades (Hilgendorf, 2007). These Anglicisms have become pervasive features of German, appearing frequently in domains such as politics, law, business, advertisement, media, and education (Hilgendorf, 2001, 2005, 2007). Theoretical and empirical developments in the field of second language acquisition have resulted in a pedagogical shift towards a proficiency-oriented approach to language instruction, which emphasizes use of authentic language materials. In the case of German, such materials would, necessarily, need to include an abundance of Anglicisms. This, however, leads to an interesting situation for learners of German who speak English as a first language (henceforth referred to as L1-English speakers). Anglicisms in contemporary German tend to be characterized by "zero orthographical integration and minimal phonological integration" (Onysko, 2007: 62), which in turn often results in ambiguous grapheme-phoneme-correspondences. Psycholinguistic research indicates that such ambiguities delay word recognition (e.g., Baron & Strawson, 1976; Forster & Chambers, 1973; Frederiksen & Kroll, 1976; Stanovich & Bauer, 1978; Glushko, 1979). Furthermore, research on bilingualism strongly suggests that the bilingual mental lexicon is stored in an integrated, language non-selective manner (Brysbaert et al., 1999; De Groot et al., 2000; Dijkstra & Van Heuven, 2002; Dijkstra et al., 1998; Jared & Kroll, 2001; Kim & Davis, 2003; etc.), in addition to which orthographic, phonological and semantic overlap have been shown to play roles in bilingual word recognition

(Dijkstra et al., 1999; Jared & Kroll, 2001). The cumulative results of this research suggest that these orthographically unintegrated Anglicisms – particularly those which are also cognates – will pose a unique challenge to L1-English learners of German in regards to pronunciation.

The goal of this paper is to explore and elaborate on this issue. Chapter Two outlines aspects of second language acquisition relevant to the potential educational implications of difficulty with pronunciation of Anglicisms for L1-English learners. Chapter Three discusses research and theories on reading and bilingualism which establish the theoretical basis for hypothesizing that Anglicisms may pose a challenge. In Chapter Four, the state of Anglicisms in contemporary German is explained and related back to the research discussed in Chapter Three, in order to further elucidate the problem. Chapter Five presents a study aimed at ascertaining whether or not Anglicisms are an issue for English-dominant learners of German. Finally, a discussion on the acquisitional and didactic implications of the study takes place in Chapter Six, and strategies for addressing Anglicisms are suggested.

2. Second Language Acquisition

In order to investigate the challenge that orthographically unintegrated Anglicisms in the German language might pose to learners of German whose first language (L1) is English, it is first necessary to discuss the theoretical background in the field of second language acquisition (SLA). This section will look first at the concept of competence, particularly lexical competence. Next, the theoretical background to a communicative, contextualized approach to foreign language teaching is discussed, following which the proficiency-orientation in foreign language instruction is explained. Finally, affective aspects of second language acquisition are discussed.

2.1. Competence

After Chomsky (1965) differentiated between competence and performance, his idea of competence was further developed by other linguists and defined as *communicative competence* – the ability of a speaker to use a language communicatively (Campbell & Wales, 1970; Hymes, 1972; Savignon, 1972). Canale and Swain (1980) developed this definition further to include grammatical, sociolinguistic, discourse and strategic competences. Lexical competence includes the knowledge of spelling, pronunciation, word class, syntactic and semantic characteristics (Ellis & Beaton, 1993; Nation, 1990; Richards, 1976; etc.), syntactic behavior (Laufer, 1990, 1993) and the collocation of words (Pawley & Syder, 1983; Schmidt, 1992), in addition to the ability to use words online (Meara 1996). Simply put, lexical competence is the ability to use a word correctly in all aspects. Because the definition of grammatical competence given by Canale

and Swain includes the use of appropriate grammar, pronunciation and vocabulary, it can largely be considered as lexical knowledge. Defined thusly, lexical competence is an important component of grammatical competence and, as such, communicative competence as a whole.

2.1.1. Lexical Competence

Laufer and Paribakht (1998) analyzed the relationship between passive (P), controlled active (CA) and free active (FA) vocabulary knowledge in ESL and EFL learners. Passive vocabulary knowledge was defined as "understanding [a word's] most frequent meaning," controlled active knowledge as the "cued recall of [a] word," and free active knowledge as the "spontaneous use of a word in a context generated by the user" (370-371). They found that the P vocabulary was largest and the FA the smallest. Additionally, they determined that the CA vocabulary, and to a smaller degree also the FA, grow, although not proportionally, in relation to the P vocabulary. A positive correlation between the vocabulary size and the proficiency of a learner was also found, which demonstrates the importance of lexical competence in the development of communicative competence.

The PAROLE corpus (Parallèle, Oral en Langue Etrangèr), an oral corpus of language use by learners of English, Italian and French (Hilton et al., 2008), supports this point. A quantitative analysis of the corpus showed a relationship between knowledge of a second language (L2) and how fluent a learner can use their L2 in a self-generated monologue. It also indicated that the majority of pauses from L2-learners are the result of an incomplete lexical competence (Hilton, 2008). We will return to this study in Chapter Six.

2.2. Communication and Context

In 1982, Krashen proposed his *monitor model*, in which he developed the *input hypothesis*, according to which acquisition is only possible when so called comprehensible input is provided. He further explains that the input should be interesting, should not be presented in a grammatically determined order, and should be slightly more complex than what the learner is already capable of, all while the input can still be understood through context, pre-existing knowledge and extralinguistic information.

In his *interaction hypothesis*, Long (1981) stresses the role of interaction and language production by learners in order to promote acquisition. He claims that speakers modify their language through interaction and *negotiation of meaning* (Long, 1983) – the "[linguistic] exchanges between learners and their interlocutors as they attempt to resolve communication breakdowns and work towards mutual comprehension" (Pica et al., 1989: 65). Selinker (1974) describes *interlanguage* (IL) – "The language of the learner" (Shrum & Glisan, 2000: 6) – as the individual linguistic system of a learner, which arises from five cognitive processes: (1) interference from the L1, (2) effects of teaching, (3) overgeneralizations of the rules of the target language, (4) strategies used to learn a second language, and (5) strategies used to communicate in a second language (summary from Shrum & Glisan, 2000: 6-7). In his *noticing hypothesis*, Schmidt (1990, 1995, 2001) claims that *noticing* – the noticing of linguistic elements – is necessary in order to acquire a language. Furthermore, Ellis (1997) and Gass (1988) claim that learners modify their IL as a result of noticing. According to the *interaction hypothesis*, learners

must actively participate in class so as to facilitate noticing and thereby the modification of their IL. In short, communication is necessary in the successful acquisition of a language.

Swain (1985, 1995) elaborated on the theories and research surrounding interaction to propose a *pushed output* – "output that is accurate and sociolinguistically appropriate" (from Shrum & Glisan 2000: 7) – which is necessary to attain a higher level of linguistic competence. Together, the theories of Krashen (1982), Long (1981, 1983) and Swain (1985, 1995) stress the importance of input, output and interaction in the acquisition process, and indicate that communication and context are needed in order to successfully acquire a language.

2.3. The Proficiency Orientation

The American Council on the Teaching of Foreign Languages (ACTFL) published the *Provisional Proficiency Guidelines* in 1982, which they revised in 1999, and most recently in 2012. These are a series of guidelines based on the aforementioned theories, which describe the skills that learners at a certain level of language learning should have, and shift the emphasis in the foreign language classroom to the development of proficiency (Shrum & Glisan, 2000: 28). Buck, Byrnes, & Thompson (1989) define three criteria that are used to define language abilities in the proficiency orientation, which Shrum & Glisan (2000) explain:

> (1) Functions: linguistic tasks performed such as asking for information, narrating past activities or expressing opinions.
>
> (2) Contexts/contents: the settings in which one uses language, for example, informal settings, transactional situations, formal settings, together with the topics or themes of conversation, such as topics related to self and to immediate environment […], concrete topics of personal and general interests, and abstract topics.

> (3) Accuracy: the precision of the message in terms of fluency, grammar, vocabulary, pragmatic competence, pronunciation, sociolinguistic competence.
>
> (28)

Omaggio Hadley (2001) lists five principles outlining the general characteristics of a classroom that she believes to be conducive to achieving the goals set out by the ACTFL:

> Hypothesis 1. Opportunities must be provided for students to practice using language in a range of contexts likely to be encountered in the target culture.
>
> > Corollary 1. Students should be encouraged to express their own meaning as early as possible after productive skills have been introduced to the course of instruction.
> >
> > Corollary 2. Opportunities must be provided for active communicative interaction among students.
> >
> > Corollary 3. Creative language practice (as opposed to exclusively manipulated or convergent practice) must be encouraged in the proficiency-oriented classroom.
> >
> > Corollary 4. Authentic language should be used in instruction wherever possible.
>
> Hypothesis 2. Opportunities should be provided for students to practice carrying out a range of functions (tasks) likely to be necessary in dealing with others in the target culture.
>
> Hypothesis 3. The development of accuracy should be encouraged in proficiency-oriented instruction. As learners produce language, various forms of instruction and evaluative feedback can be useful in facilitating the progression of their skills toward more precise and coherent language use.
>
> Hypothesis 4. Instruction should be responsive to the affective as well as the cognitive needs of students, and their different personalities, preferences, and learning styles should be taken into account.

> Hypothesis 5. Cultural understanding must be promoted in various ways so that students are sensitive to other cultures and are prepared to live more harmoniously in the target-language community.
>
> (90-91)

As is underscored by both Omaggio Hadley and Buck, Byrnes, & Thompson, the proficiency orientation considers contextualized language which resembles authentic language use as much as possible, and includes the use of authentic materials such as newspapers and films, to be the basis of an approach that develops language competencies. In short, it is the goal of foreign language instruction to create an environment in which authentic communication is promoted in order to develop proficient speakers.

2.4. Affective Factors in Second Language Acquisition

Affective factors such as motivation, anxiety, personality, and attitude are considered important aspects related to success in second language acquisition (cf. Dulay & Burt, 1977). Gardner (1985) differentiates between two kinds of motivation: "(1) *instrumental* (learning a language to get a better job or to fulfill an academic requirement) and (2) *integrative* (learning a language to fit in with people who speak the language natively)" (as summarized in Shrum & Glisan, 2000: 13). Additionally, these two types of motivation are likely interrelated (cf. Gardner & MacIntyre, 1993). Citing Gardner (1985) and Tucker, Hamayan, & Genesee (1976), Shrum & Glisan (2000) note that "motivation encourages greater effort from language learners and usually leads to greater success in terms of language proficiency and maintenance of language skills over time" (14). It is further explained that "motivation and attitudes are often related to anxiety or apprehension or fear about the language learning experience" (14). In short, affective aspects of

the language learning process play important roles in how successful a learner will be in achieving proficiency.

Summary

This chapter has outlined the theoretical and practical background in SLA necessary to understand the potential challenges L1-English learners of German may face when encountering Anglicisms. Lexical competence was shown to be an important part of communicative competence, and to be correlated with language proficiency. The importance of communication and context in the foreign language classroom were established on the basis of input, output, interaction, negotiation of meaning, noticing and interlanguage. The proficiency orientation, which is grounded in these concepts, was explained and its emphasis on authentic communication stressed. Finally, affective factors related to success in second language acquisition were explained. Chapter Three will now discuss research and theories related to reading, in order to establish the foundational understanding for where and why the hypothesized difficulties with Anglicisms might arise.

3. Reading

Reading is a well researched and strongly promoted strategy in SLA (e.g., Krashen, 1994), which is often used in the development of lexical competence. Research on reading indicates that it plays a role in developing receptive and productive language skills (e.g., Cho & Krashen, 1994; Elley, 1991; Hafiz & Tudor, 1990; Janopoulos, 1986; Robb & Susser, 1989). Nevertheless, reading has its shortcomings. There is increasing evidence suggesting that the bilingual mental lexicon is stored in an integrated, language non-selective manner (Brysbaert et al., 1999; De Groot et al., 2000; Dijkstra & Van Heuven, 2002; Dijkstra et al., 1998; Jared & Kroll, 2001; Kim & Davis, 2003; etc.). Furthermore, it has been shown that not just orthographic overlap, but also phonological and semantic overlap play roles in bilingual word recognition (Dijkstra et al., 1999; Jared & Kroll, 2001). This indicates that reading alone is an insufficient strategy for the development of lexical competence, and that this may be particularly problematic for L1-English learners of German encountering Anglicisms. Before addressing the challenge of Anglicisms directly, and in order to establish the basis for the hypothesized difficulties, this chapter will discuss the concept of the grapheme-phoneme-correspondence, followed by research and theories on visual word recognition, cognates and homographs, and reading aloud.

3.1. The Grapheme-Phoneme-Correspondence

The grapheme is defined by Fuhrhop as “the smallest meaningful unit in written language” (trans. 2009: 6). In German and English, which both use alphabetic scripts, a

grapheme is a letter or sequence of letters which orthographically represent one or more phonemes – the smallest meaningful units in spoken language, analogous to the grapheme. The correspondence between a grapheme and phoneme is called the grapheme-phoneme-correspondence. Studies demonstrate that this correspondence plays a role in reading. For example, children whose L1 is Turkish, a language with a shallow orthography – an orthography with a high degree of one-to-one grapheme-phoneme-correspondences – read with high accuracy as early as the end of the first grade (Öney & Durgunoğlu, 1997). Conversely, children whose L1 has a deeper orthography – one exhibiting more ambiguity in grapheme-phoneme-correspondences – such as English and German, must rely on more than just these correspondences to identify a word, and therefore have greater difficulties learning to read (cf. Goswami et al., 1998). Furthermore, comparative studies indicate that these difficulties are greater for English-speaking children than German-speaking children (Goswami et al., 2001; Wimmer & Goswami, 1994; Wimmer & Hummer, 1990). Because a child learning to read already speaks his L1, the difficulties in word-recognition therefore result from a difficulty with the pronunciation of a word arising from ambiguity in the grapheme-phoneme-correspondences, whereby the child would otherwise recognize the word upon hearing it. This would also concern previously unknown words when the child encounters them for the first time in reading, in that the grapheme-phoneme-correspondence ambiguity would lead to uncertainty about the correct pronunciation of the word.

These difficulties resulting from ambiguous grapheme-phoneme-correspondences also exist in the domain of SLA. The task of developing reading competency in an L2 is more complicated, in that an L2 learner already possesses an established set of grapheme-phoneme-

correspondences in his L1 which do not necessarily correspond to those of the target language: Sometimes common graphemes represent different sounds which may not exist in both languages – such as the grapheme ⟨r⟩ in English and in German – and sometimes graphemes of one language do not exist in the other language, such as the English graphemes ⟨ph⟩, ⟨ou⟩, ⟨th⟩ etc., which are not German graphemes. It is the task of the learner, with help from the instructor, to establish the appropriate connections between such graphemes and their respective sounds in the L2. Learning to read in an L2 therefore requires not just the learning of the orthographic forms of words, but also the establishment of a new orthographic system with different grapheme-phoneme-correspondences. From this task arises the potential for negative transfer – the incorrect application of an L1 rule to the L2 – through which a word or sound sequence may be incorrectly pronounced in accordance with the grapheme-phoneme-correspondences of the L1. Figure 3.1 shows the German grapheme-phoneme-correspondence system.

⟨p⟩ → /p/	⟨ch⟩ → /ç/	⟨ü⟩ → /y/ or /Y/
⟨t⟩ → /t/	⟨w⟩ → /v/	⟨e⟩ → /e/ or /ɛ/ or /ə/
⟨k⟩ → /k/	⟨j⟩ → /j/	⟨ö⟩ → /ø/ or/œ/
⟨b⟩ → /b/	⟨h⟩ → /h/	⟨ä⟩ → /eː/ or /ɛː/
⟨d⟩ → /d/	⟨m⟩ → /m/	⟨a⟩ → /ɑ/ or /a/
⟨g⟩ → /g/	⟨n⟩ → /n/	⟨o⟩ → /o/ or /ɔ/
⟨qu⟩ → /kv/	⟨ng⟩ → /ŋ/	⟨u⟩ → /u/ or /ʊ/
⟨f⟩ → /f/	⟨l⟩ → /l/	⟨i⟩ → /ɪ/
⟨ß⟩ → /s/	⟨r⟩ → /R/	⟨ei⟩ → /ai/
⟨s⟩ → /z/	⟨z⟩ → /ts/	⟨au⟩ → /au/
⟨sch⟩ → /ʃ/	⟨ie⟩ → /i/	⟨eu⟩ → /ɔi/

Figure 3.1 German grapheme-phoneme-correspondences of regularly produced spellings used in the core vocabulary. Based on Eisenberg (2006) pp. 306-309[1]

[1] Eisenberg's list uses /æ/ for the grapheme ⟨ä⟩, but to maintain the distinction between the English and German phonemes represented by this symbol, /eː/ and /ɛː/ are used instead. For Eisenberg's discussion on this, see Eisenberg (2006) pp. 96-98

The letters ⟨c, y, v, x⟩ are not included in this list, as they either occur only in foreign words or as marked spellings in the core German vocabulary (Eisenberg, 2006: 306-307). It should also be noted that there is a tense/lax opposition for German vowels which is determined by the phonotactic environment of the vowel. While exceptions to the following exist (see Eisenberg, 2006: 120), Fuhrhop (2009) lists four means by which this opposition is orthographically represented:

1. Doubling of the vowel (*Beet* has a tense vowel)
2. Doubling of consonants (*Bett, Bann, still* result in reading a lax vowel)
3. Insertion of a lengthening-h (*Bahn* has a tense vowel)
4. ⟨ie⟩ as an exceptional spelling for the tense, front, high, unrounded vowel

Fuhrhop, 2009: 15

As can be seen in Figure 3.1, there are grapheme-phoneme-correspondences that are common to both English and German, correspondences in which a grapheme common to English and German maps onto a non-English phoneme, correspondences in which a non-English grapheme represents a phoneme common to English and German, correspondences where shared graphemes and phonemes map differently in German and English, and correspondences where neither the grapheme nor the phoneme exist in English. Table 3.1 illustrates this.

Shared correspondence	Shared grapheme; non-English phoneme	Shared phoneme; non-English grapheme	Shared grapheme and phoneme; different correspondences	Non-English grapheme and phoneme
⟨p⟩ → /p/ ⟨t⟩ → /t/ ⟨k⟩ → /k/ ⟨b⟩ → /b/ ⟨d⟩ → /d/ ⟨g⟩ → /g/ ⟨f⟩ → /f/ ⟨h⟩ → /h/ ⟨m⟩ → /m/ ⟨n⟩ → /n/ ⟨ng⟩ → /ŋ/ ⟨sch⟩ → /ʃ/ ⟨l⟩ → /l/ ⟨ie⟩ → /i/ ⟨e⟩ → /ɛ/ ⟨e⟩ → /ə/ ⟨a⟩ → /ɑ/ ⟨o⟩ → /o/ ⟨o⟩ → /ɔ/ ⟨u⟩ → /u/ ⟨u⟩ → /ʊ/ ⟨i⟩ → /ɪ/	⟨ch⟩ → /ç/ ⟨r⟩ → /R/ ⟨a⟩ → /a/	⟨ß⟩ → /s/ ⟨ä⟩ → /eː/ ⟨ä⟩ → /ɛː/	⟨qu⟩ → /kv/ ⟨s⟩ → /z/ ⟨w⟩ → /v/ ⟨j⟩ → /j/ ⟨z⟩ → /ts/ ⟨e⟩ → /e/ ⟨au⟩ → /au/ ⟨eu⟩ → /ɔi/ ⟨ei⟩ → /ai/	⟨ü⟩ → /y/ ⟨ü⟩ → /Y/ ⟨ö⟩ → /ø/ ⟨ö⟩ → /œ/

Table 3.1 Illustration of the relations of German grapheme-phoneme-correspondences to English

It bears mentioning that this table is not intended as an exhaustive analysis of how German grapheme-phoneme-correspondences relate to English, but rather to demonstrate where potential difficulties for L1-English learners of German might arise. Exceptions to the classifications of the correspondences do occur. For example, ⟨sch⟩ is [sk] in *school* and ⟨au⟩ → /au/ does occur in certain loanwords such as *luau* and *ablaut*.

Analyzing the table, one might reasonably suppose that the correspondences in the first column will be the easiest for an L1-English learner of German to learn, as they need only recognize that these correspondences occur in German as well. Possible pronunciation

difficulties notwithstanding, the final column is also less likely to present the greatest difficulty, as correspondences involving new graphemes and phonemes are involved, mitigating the possibility of L1-interference. Similarly, the middle column requires only that the learners associate the new grapheme with an already familiar phoneme. The second and fourth columns, however, are likely to present greater difficulties, as they involve learning to recognize a common grapheme as representing a new phoneme (column 2), or learning to associate a shared grapheme with a shared phoneme in a novel way (column 4). In these two cases, the possibility of L1-interference occurring in determining the grapheme-phoneme-correspondences is likely greater.

3.2. Visual Word Recognition

Frequency and neighborhood density play important roles in either facilitating or delaying word recognition. The frequency effect is a phenomenon whereby the processing speed of a linguistic unit is affected by how often it occurs – the more often, the faster it will be processed. This effect is well documented in word recognition studies (e.g., Howes & Solomon, 1951; Whaley, 1978; Forster & Chambers, 1973, as cited in Harley, 2008: 173). Neighborhood density, or neighborhood size, affects visual word recognition in that words with more neighbors, i.e., orthographically similar words, are more easily recognized (Andrews, 1989; Grainger, 1990; McCann & Besner, 1987, as cited in Harley, 2008: 176). This facilitating effect, however, has only been clearly found with low-frequency words (cf. Harley, 2008: 176).

The *bilingual interactive activation plus model*, or *BIA+* (Dijkstra & Van Heuven, 2002), is a connectionist model for bilingual visual word recognition. Connectionism views language-learning as the establishment of linguistic patterns and regularities from input. As such, it places great importance on language use. Learning is, accordingly, the establishment of associations whose strength is determined by frequency (Gass & Selinker, 2008: 219-226). The BIA+ can be explained in the following five central assumptions:

(1) *The bilingual mental lexicon is stored in an integrated manner and lexical access is not language selective*. This assumption is well supported in research. For example, Van Heuven et al. (1998) performed a study on the reaction times of bilingual speakers of Dutch and English in a series of lexical decision experiments. They found a slowing of reaction times with increasing orthographic similarity, which suggests an activation of orthographically similar words in both languages in word recognition. Similar slowing effects have been found in bilingual speakers of French and English (Bijeljac-Babic et al., 1997).

(2) *Homographs are represented twice in the mental lexicon and have activation levels which are determined by their frequency in their respective languages*. Activation level refers to the amount of stimulation that a language node requires in order to become activated. Evidence of this assumption is provided by a number of studies finding facilitating effects of orthographic and semantic similarity in lexical decision tasks (Dijkstra et al., 1998, 1999, 2000; Lemhöfer & Dijkstra, 2004). Additionally, Van Heuven et al. (1998) and Bijeljac-Babic et al. (1997) found differences between beginning and advanced

learners in reaction times which implicate the role of frequency. The observed differences in reaction time can be explained by the frequency effect, in that advanced learners would have had greater overall exposure to their L2 and would likely also encounter the words of their L2 more often. This also seems to support the assumption that the frequency of a homograph in its respective language determines its activation level.

(3) *Linguistic context affects the recognition system, while non-linguistic context affects the task and decision system*. Dijkstra and Van Heuven (2002) define linguistic context effects as the effects arising from lexical, syntactic or semantic sources, and non-linguistic context effects as the effects arising from instruction, task-demand or expectations of the participants (187). The BIA+ model also states that word recognition in the context of a sentence is sensitive to syntactic and semantic information for different languages. A study from Altarriba et al. (1996) supports this assumption. The study found interaction between linguistic sentence context and word recognition, in addition to a frequency effect – but no language effects – on sentence restrictions. As such, Dijkstra and Van Heuven (2002) proposed that pre-activation of a language node through sentence context is insufficient, as it could not significantly suppress the activation of other words. This means that word recognition occurs in a strictly bottom-up manner, according to their model.

(4) *The phonological and semantic codes activated in the L2 by their orthographic representations are delayed in comparison to those of the L1*. This is called the *temporal delay assumption* (183). It is further explained that, as a result of the temporal delay assumption, the L1 exhibits a stronger influence on the L2 than the L2 on the L1 – that

is, the frequency effect is more pronounced in the L1. Word recognition in reading L2 words resembling L1 words would therefore occur more slowly because the L1 candidates would have lower activation levels enabling an earlier and initially stronger activation of these words, which would then need to be suppressed by the task and decision system.

(5) *Language nodes are not influenced by non-linguistic information sources outside of the word recognition system, and language nodes do not significantly affect word recognition within the system*. This means that there is no top-down influence on word recognition.

According to the model, word recognition occurs as follows: The input (a word) is perceived and potential word candidates become activated in accordance with their orthographic similarity and activation levels. Next, the appropriate phonological, semantic etc., representations of the already orthographically activated word candidates become activated. The model explains that the similarity of a word candidate to the input determines activation and the language to which the candidates belong plays no role. The greater the overlap between input and word candidate, the stronger the activation, which leads to the recognition of the appropriate word. Evidence of this overlap effect is furthermore provided by studies on cognates and homographs (Font, 2001; Cristoffanini et al., 1986).

3.3. Cognates and Homographs

Cognates are words in two languages that have the same orthographic form and the same or very similar meanings. Research on cognates and homographs – words in two languages that have the same orthographic form but different meanings – shows different effects of orthographic, semantic and phonological similarities. For example, Dijkstra et al. (1999) performed a study in which bilingual speakers of Dutch and English had to decide if a word belonged to the English language. They found that orthographically and semantically similar words led to a faster decision, whereas phonologically similar words slowed the decision. In a study with bilingual speakers of English and Afrikaans, Doctor & Klein (1992) found that the reaction times in a lexical decision task were longer for homophones than they were for homographs. Moreover, a study by Tzelgov et al. (1996) indicates that bilinguals simultaneously apply the grapheme-phoneme conversions of both of their languages during language processing.

Let us now consider these findings in the framework provided by the BIA+ model. Dijkstra et al. (2010) found evidence supporting their Dutch-or-not-Dutch mechanism for language selection. According to the proposed mechanism, participants in lexical decision tasks on language membership scan the visual input for divergence from the orthographic patterns of their L1 and dismiss incongruent orthographic patterns without accessing the phonological representations (294). This finding suggests that study participants tend to perceive words as disjunctively belonging to a language or not belonging to it. If homographs are represented twice in the mental lexicon, they would then be interpreted in the specified language, as the participants would already be primed to do so. Semantic similarities would facilitate word

recognition in that overlap and frequency effects in both languages would enable the quickest possible access to meaning, while the applied grapheme-phoneme conversions of both languages simplify the task of the decision system via phonological divergence. Conversely, the task of the decision system would become more difficult if the applied grapheme-phoneme conversions nevertheless lead to the activation of phonologically similar or identical forms, because the non-target-language form would need to be suppressed in order to determine language membership.

This indicates a complication in the bilingual processing of cognates whose pronunciation in the concerned language is similar. This complication would likely be more prominent with cognates exhibiting a deviation from the regular grapheme-phoneme-correspondences of the L2, in that the pronunciation would be unclear, leading to a greater possibility that the learner applies the grapheme-phoneme-correspondence rules of his L1 and, as such, uses a similar or identical phonological form.

3.4. Reading Aloud

Phonology and regularity have both been found to play roles in word recognition and naming. Research indicates that a word's phonology is automatically accessed when read, and that this, in turn, affects naming. For example, a common finding is that regular words – words with regular grapheme-phoneme-correspondences (e.g. *bead*) – are named faster than exception words – words with irregular grapheme-phoneme-correspondences (e.g. *head*) – (e.g., Baron & Strawson, 1976; Forster & Chambers, 1973; Frederiksen & Kroll, 1976; Stanovich & Bauer, 1978, as cited in Harley, 2008: 214). Glushko (1979) found that the naming of regular words is

slower relative to control words if the test word has irregular neighbors. There is also evidence that homophony interferes with word recognition (e.g., Lesch & Pollatsek, 1998; Folk, 1999; Pexman, Lupker, & Jared, 2001; Pexman, Lupker, & Reggins, 2002). Thus, it is apparent that a word's phonology is not only accessed rapidly and automatically, but this automatic access affects both naming and word recognition, even if orthography should be sufficient to disambiguate a word.

3.4.1. The Dual-Route Cascaded Model

The *dual-route cascaded* (*DRC*) model (Coltheart et al., 1993; Coltheart & Rastle, 1994; Coltheart et al., 2001) is a computational model of reading. In this model, there is a non-lexical grapheme-phoneme rule system and a lexical system for word recognition. The lexical system is further divided into a semantic route and a non-semantic route. The lexical and non-lexical dichotomy for word naming is necessary to explain our ability to pronounce regular words, pseudowords (pronounceable nonwords) and irregular words (cf. Harley, 2008: 211). In the non-lexical system, the pronunciation of a word is determined by making use of the grapheme-phoneme-correspondences. As this would lead to an incorrect pronunciation for exception words, the lexical system is posited as involving a direct link from orthography to phonology, whereby the pronunciation for such words is retrieved without need of grapheme-phoneme conversion. Furthermore, to explain the longer naming times for irregular words relative to regular words, the model claims that a word's pronunciation is assembled via both routes simultaneously, and that the conflicting pronunciations produced when an irregular word is being named are responsible

for this difference in naming times. Figure 3.2 illustrates the basic architecture of the dual-route cascaded model.

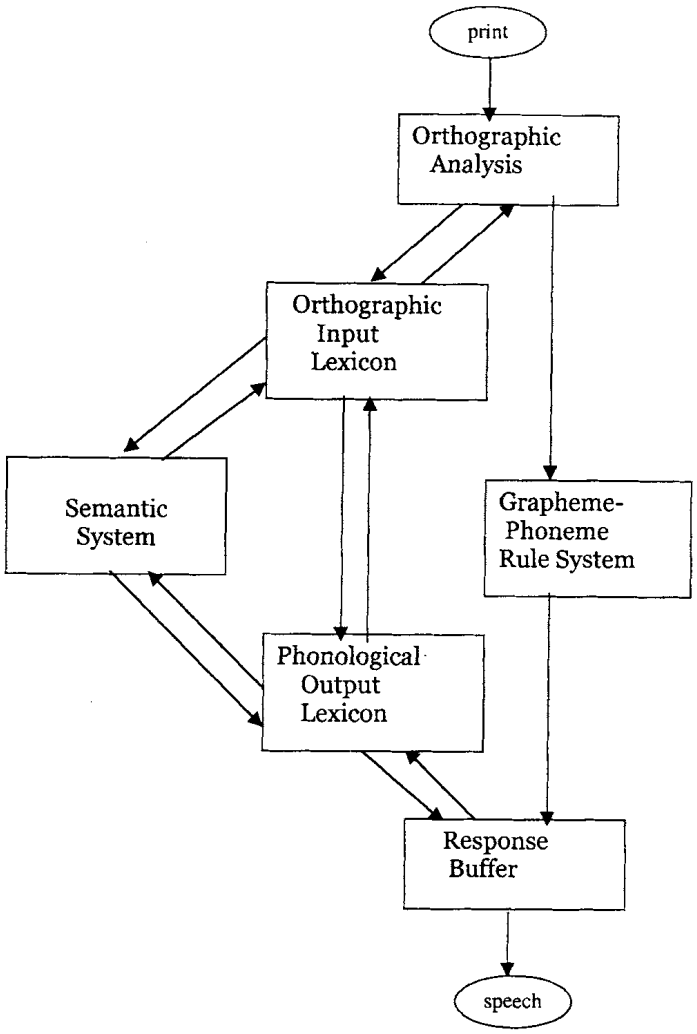

Figure 3.2 Basic architecture of the dual-route cascaded model of visual word recognition and reading aloud. From Coltheart, Rastle, Perry, Langdon, & Ziegler (2001) pp. 213

To further illustrate how this model works, consider the irregular word *head*. The non-lexical system would make use of the direct link from orthography to phonology to arrive at the pronunciation, /hɛd/, whereas the lexical system would assemble the pronunciation /hid/ by means of grapheme-phoneme-correspondences. In the response buffer stage, these two

pronunciations would be at odds, and the correct pronunciation would need to be selected by the system. Due to the conflicting output of each system, the naming time for *head* would presumably be slower than that of a frequency-matched regular word.

3.4.2. The Parallel Distributed Processing Model

The *parallel distributed processing model*, or *PMSP* for short (Plaut, McClelland, Seidenberg, & Patterson, 1996), is a connectionist model which improves on the shortcomings of the SM89 (Seidenberg & McClelland, 1989). In the PMSP, orthographic, phonological and semantic information are each represented in their own respective domains as distributed patterns of activity. Similar words are represented within a domain by similar patterns of activity, and these domains interact via weighted connections that are learned through exposure to the visual, phonological and semantic representations of words. That is, the more the system is exposed to a word's phonological, orthographic and semantic representations in conjunction with one another, the stronger the weighting between the associative connections becomes, i.e., the system learns to associate these with one another based on the frequency of their co-occurrence.

To explain how the pronunciation of a word is derived from its orthography, the model makes use of phonotactic and graphotactic constraints. All possible graphemes in a sequence of letters comprising a word map onto all possible phonemes. The phonemes are grouped into separate clusters corresponding to the syllable onset, nucleus and coda. Phonotactic constraints then determine the order of the phonemes, and frequency, represented by the weighted

connections, would resolve any ambiguities that arise. The following example illustrates this process:

1. The word *trail* is perceived.
2. The possible graphemes and their respective possible phonemes are activated:
   ⟨t⟩ : /t/
   ⟨r⟩ : /r/
   ⟨a⟩ : /æ, e, ʌ, ɒ, ɔ/
   ⟨ai⟩ : /e, ɛ/
   ⟨i⟩ : /ɪ, aɪ/
   ⟨l⟩ : /l/
3. Phonotactic constraints determine that the order of the onset phonemes is /tr/, and the weighting of the connections select ⟨ai⟩ as the grapheme and /e/ as the phoneme of the nucleus.
4. The pronunciation /trel/ is assembled.

Summary

Chapter Three has discussed research and theories related to reading which provide the basis for the hypothesis that Anglicisms will be particularly problematic for L1-English learners of German in regards to pronunciation. The grapheme-phoneme-correspondence is noted to play an important role in learning to read both in one's L1 and L2, which is complicated by ambiguity. Research suggests that visual word recognition is sensitive to word frequency and neighborhood density. Furthermore, an accumulating body of evidence strongly indicates that the bilingual mental lexicon is integrated and language non-selective. Research in the framework of the BIA+ has also found different effects of orthographic, semantic and phonological similarity, and linguistic and non-linguistic context during word recognition. Two psycholinguistic models of reading were explained, which attempt to account for the observed effects of phonology and regularity when reading aloud. Both will be returned to in the next chapter. Finally, a contrastive

analysis of English and German grapheme-phoneme-correspondences demonstrated where English-speakers might experience negative transfer when learning the German orthographic system. Importantly, this potential for negative transfer becomes even greater with foreign words: Eisenberg (2006) notes that "the spelling of foreign words is, overall, less consistent than that of the core vocabulary" (trans. 352; see 350-357 for the complete discussion on foreign words). The following chapter now brings the discussion to Anglicisms in German in order to elaborate on this point and explicate the difficulty these words pose to L1-English learners of German.

4. Anglicisms in Contemporary German

English has had an increasing influence on the German language since the 17th century (Hilgendorf, 2007), which has resulted in pervasive borrowing – "the incorporation of lexical or structural features of another language into the speaker's first language" (Thomason and Kaufman, 1988: 37, as cited in O'Shannessy, 2011: 79-80). Today, the majority of foreign words in the German language are borrowed from English (O'Halloran, 2002; Bär, 2001; Hilgendorf, 2007). Anglicisms in German were primarily borrowed from British English up until World War II, after which American English became the main source of influence (Hilgendorf, 1996). O'Shannessy (2011) states that vocabulary for non-basic concepts is borrowed first. Accordingly, Reinhold Utri (2008) explains that "anglo-American words and terms occur with increasing frequency in German because it would be very difficult to find appropriate, useful German equivalents for some new and previously unused words" (trans. 145). It is therefore unsurprising that Anglicisms occur frequently in the domains of sports, media, economics, computing (Bär, 2001), and science (Utri, 2008). Furthermore, Eisenberg (2006) explains that "we encounter foreign words above all in the written modality" (trans. 351). As such, students are very likely to encounter these words, particularly in a classroom using authentic materials. This may seem unproblematic at first – an L1-English learner of German would already know these words, facilitating recognition and comprehension – but matters are more complicated when it comes to pronunciation.

Utri (2008) describes the pronunciation of foreign words in German as "the first hurdle which must be cleared," and explains that it is unclear with some words (Anglicisms) whether

they should be pronounced in a more English or German manner (trans. 146). As early as 1965, Broder Carstensen remarked that English words were borrowed with their English pronunciation. Onysko (2004) notes that "speakers of German generally try to imitate English pronunciation as closely as possible, depending on individual knowledge of English" (60). This in itself will result in varying degrees of transference of aspects of German phonology onto these Anglicisms, making integration patterns more difficult to recognize (for more on the phonological integration of Anglicisms into German, see Onysko, 2004: 60-61; Matulova, 2007). Furthermore, Anglicisms in German have largely maintained their English spelling (Onysko, 2007:62), which further obfuscates integration patterns.

4.1. Outlining the Issue

Returning to the psycholinguistic theories and models discussed in Chapter Three, and given the unclear integration patterns for Anglicisms into German, the potential difficulties for L1-English learners of German regarding Anglicisms will now be explained.

The most evident potential source of difficulty stemming from Anglicisms in German is the general lack of orthographic and phonological integration, which complicates the task of the L1-English learner, who must attempt to discern how the graphemes, whose grapheme-phoneme-correspondences he already knows in English, are integrated into the German language and which phonemes correspond to which graphemes. A discussion from Eisenberg (2006: 353-354) on frequent and typical vowel-correspondences of Anglicisms in German makes two things evident: (1) there are regular patterns for the integration of Anglicisms into German, and (2)

these integration patterns create grapheme-phoneme-correspondences which deviate from the regular German system and are therefore ambiguous. As such, the very integration patterns which may bring clarity to the confusion surrounding the pronunciation of Anglicisms lead to a different problem stemming from the resulting ambiguous grapheme-phoneme-correspondences. Thus, the learner cannot rely entirely upon his previously acquired knowledge of German or English grapheme-phoneme-correspondences, but must learn new associations differing from these systems. Two possibilities for erroneous pronunciation arising from negative transfer follow from this: (1) L1-interference – where the learner pronounces the words with a more English pronunciation – or (2) overgeneralization – where the learner incorrectly applies the native grapheme-phoneme-correspondences of German to these Anglicisms.

The research done in the framework of the BIA+ model illustrates the potential implications of an English pronunciation being produced via L1-interference. Recall that words become activated in accordance with their orthographic similarity to the input, and that the phonological codes corresponding to the orthographic form will be activated for all of the languages of the perceiver. Following the temporal delay assumption, we can expect that an L1-English learner of German will experience stronger activation of the English phonology than the German phonology when reading a cognate or homograph. The decision system must then suppress the English pronunciation and select the German phonology, thus delaying word recognition. Even with increased proficiency, the potential for phonological inhibition remains for Anglicisms whose pronunciation is more similar to English, or whose ambiguous grapheme-phoneme-correspondences result in an English pronunciation being arrived at, even when incorrect.

To further illustrate this complication, consider the Anglicism *Pub*, which is pronounced /pab/ in German. Following the dual-route cascaded model for reading aloud, an L1-English learner of German encountering this word for the first time can rely neither on the lexical nor the non-lexical route to assemble the correct pronunciation. The lexical route will arrive at the incorrect pronunciation /pub/ if it follows the German grapheme-phoneme-correspondence system. Without an already established German pronunciation, the non-lexical route will similarly arrive at a false pronunciation, as its only possible output is /pʌb/, the English pronunciation. Thus, there are two competing forms for the learner to decide on, neither of which is correct. The PMSP demonstrates another aspect of this problem in its consideration of frequency. If the potential graphemes and phonemes of English and German are both being activated, the recognition system will therefore have the graphemes and phonemes of both languages to decide between. A learner more dominant in English than in German will also have stronger weighted connections for the English correspondences, increasing the likelihood that these incorrect correspondences will be selected by the system. Moreover, where frequency selects the German correspondences, these will often be nonetheless incorrect.

One can also reasonably expect prolonged difficulty with the pronunciation of these words, given the ambiguous correspondences. In line with the PMSP, the lower frequency of these correspondences relative to those of English and the standard German system will likely delay proper learning of the pronunciation, as exposure to and use of the words must be sufficient to establish appropriately weighted connections to select the correct pronunciation when encountered in German. Following the DRC, the words must similarly be encountered and produced enough to establish a representation in the non-lexical route which is strong enough to

be selected over the English non-lexical representation and the pronunciation derived from the lexical route. Thus, it is likely that it will not only be difficult for L1-English learners of German to determine the correct pronunciation of Anglicisms, but that this difficulty will be persistent with increased proficiency.

Summary

This chapter gave a brief description of the current state of Anglicisms in German, highlighting the fact that the manner in which these words are phonologically and orthographically integrated into German tends to result in ambiguous grapheme-phoneme-correspondences. By applying the concepts of negative transfer and overgeneralization, it was explained how these ambiguities may result in difficulties for L1-English learners of German attempting to determine the pronunciation of these words. Additionally, the application of psycholinguistic theories and research demonstrated how these problems may be persistent with increased proficiency in German. Thus, there is strong reason to believe that these words may pose a particular challenge to L1-English learners of German, which would need to be addressed in the classroom. In order to evaluate the potential educational implications of orthographically unintegrated Anglicisms for an L1-English learner of German, it must first be ascertained whether or not such difficulties exist. The following chapter describes a study, which sought to determine if the hypothesized difficulties do indeed occur.

5. The Study

5.1. Goal

This study's aim was to provide an exploratory investigation of whether or not English cognate loanwords in the German language which are not orthographically integrated are a cause of greater and persistent difficulty in pronunciation among English-dominant learners of German. Difficulty, for the purpose of this study, is defined as a measure of production accuracy. Thus, lower accuracy relative to German words not borrowed from English, and persistence thereof, can be taken as evidence of greater difficulty. To assess this, participants at the beginning and advanced levels of learning German were asked to read passages in German aloud, in which the concerned English cognates were embedded, so as to elicit their production. In addition to these English cognates, Greek and Latin loanwords were included, whose orthography is identical in German and English, whose grapheme-phoneme-correspondences in German are regular, and whose meanings in German and English are as near to identical as possible. The purpose of these is comparative – if orthographically unintegrated Anglicisms are a source of greater and persistent error, they should be produced with less accuracy than the Greek and Latin loanwords, and they should improve at a slower rate.

My hypotheses are that (1) orthographically unintegrated English cognate loanwords will be produced less accurately than Greek and Latin cognate loanwords, and (2) the accuracy with which the Anglicisms are produced will show less improvement relative to that of the Latinisms and Grecisms across proficiency levels.

5.2. Participants

Seventy-four University of Alberta undergraduate students with normal or corrected to normal vision participated on a voluntary basis. Students were registered in either beginner-level or advanced-level German language courses and had a minimum of four months of instruction in German. Participants who identified themselves as having any form of dyslexia were excluded, as well as those who were not English-dominant. Following these exclusions and data loss due to recording issues, a total of fifty-seven participant recordings remained[2]. Thirty of these were at the beginner level and twenty-seven at the advanced level. Due to these numbers, participants who learned German as an L1 but became English-dominant, i.e. heritage speakers, were not excluded. The study includes data from six heritage speakers at the advanced level, and one heritage speaker at the beginner level. The beginner-level heritage speaker was treated as any other beginner-level participant[3], whereas the advanced-level heritage speakers were analyzed separately. The structure of the participant pool is as follows: thirty beginner-level participants, twenty-one advanced-level participants, and six heritage speakers.

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[2] One of these participants identified French as being their most dominant language, followed by English. English is indicated as being a native-language of at least one of the participant's parents and at least one of their grandparents, in addition to which this participant was born in and currently lives in a region of Canada in which the language of communication is predominantly English. The communicative abilities in English were also rated by the participant with the highest possible ratings. For these reasons, the participant is considered as English-dominant.

[3] The average accuracy scores of the heritage speaker at the beginning level were always less than the maximum score and within the IQR from the mean scores. Furthermore, the L1 of this participant is a Swiss variety of Germany. For these reasons, the participant was treated as part of the beginner group and not analyzed separately or as part of the heritage group. See Christen (2009) and Auer (2004) for differences between varieties of German spoken in Switzerland and varieties spoken in Germany.

5.3. Materials

Twenty-four Anglicisms, sixteen Latinisms and five Grecisms were used (Appendix A). These words had identical orthography in English and German and meanings as near to identical as possible. The words were embedded in a series of eleven German passages (Appendix B), into syntactic positions minimizing use of inflectional morphology, so as to avoid forms orthographically different than what is possible in English.

Passages were presented to participants centrally on 21.5" LCD widescreen monitors in black, 14-point Helvetica font on a light grey background. Data were recorded using *Audacity 1.2.6*. (www.audacity.sourceforge.net)

5.4. Procedure

Participants first filled out a language history questionnaire (based on Li et al., 2006; Marian et al., 2007), following which they were asked to read the passages aloud as naturally and normally as possible into the recording device. Passages were presented one at a time.

5.5. Data Analysis

For data analysis, a coding schema was devised on which pronunciation of each phoneme in the concerned words could be marked in one of three ways: (1) conforming to the German

pronunciation as prescribed in Duden[4] and *Collins German Dictionary*; (2) conforming to the English pronunciation as prescribed in the *Cambridge English Pronouncing Dictionary*[5]; or (3) other, in which case the phoneme produced was recorded. See Appendix C for the coding schema.

The only grapheme-phoneme-correspondences which were considered were those that differed in English and German (e.g., ⟨er⟩ corresponding to [ɐ] in German but [ɚ] in English, such as in *Reader*), those that were non-German graphemes (e.g., ⟨th⟩ and ⟨c⟩), and those with environmentally conditioned variants in either language (e.g., ⟨t⟩ in the intervocalic position following a stressed vowel in English, and all German vowels as per the lax/tense distinction). Correspondences which are always the same in German and English were excluded from analysis (e.g., ⟨n⟩, ⟨m⟩, ⟨p⟩).

A certain amount of leniency had to be allowed in coding pronunciation: for example, where ⟨er⟩ was pronounced as [ə] or [ʌ], it was coded as correct despite being technically inaccurate, as it made a clear attempt at approximating the German phoneme [ɐ] produced in correspondence with the grapheme ⟨er⟩. Qualitative differences between German and English pronunciations of the tense vowels [e] and [o], which are diphthongized in English, were also ignored. When participants repeated a word in an attempt to correct their pronunciation, the final utterance of the word was the only instance considered for coding. Where test words occur more than once in a passage, only the first elicitation is considered, except where unintelligible.

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[4] *Das Fremdwörterbuch* (2010)*, Das Aussprachewörterbuch* (2005)*,* and *Deutsches Universalwörterbuch* (2007) were consulted.

[5] North American and, where relevant, specifically Canadian pronunciations were used.

Following coding, a participant accuracy tally for each grapheme-phoneme-correspondence was created and divided into an Anglicism grouping and a Latinism/Grecism grouping. Half-points were allowed for the following correspondences:

1. Sequences of a vowel followed by ⟨r⟩, where either the correct vowel is produced but followed by an [ɹ] or nothing, or the incorrect vowel is produced but followed by [ə̯].
2. ⟨ua⟩ and ⟨io⟩, as in *Situation* – [u̯a] and [i̯o] respectively – where the participant fails to produce the initial vowel of each diphthong as non-syllabic, resulting in [ua] and [io] respectively.

Tallies were then divided by the number of occurrences of each grapheme-phoneme-correspondence in each group, yielding a mean accuracy score for their production and allowing an overall mean accuracy score for Anglicisms and for Latinisms/Grecisms to be calculated for each participant. Accuracy scores were then analyzed within and across the following groups: beginners (N=30), advanced speakers (N=21), heritage speakers (N=6) and a full advanced group consisting of both the advanced and heritage speakers (N=27).

5.6. Initial Results and Discussion

Data were analyzed using StatCrunch 5.0 (www.statcrunch.com). Results of the initial analysis are depicted in Figure 5.1. Separate repeated measures of analyses of variance (ANOVAs) were conducted using proficiency as the independent variable and mean accuracy score as the dependent measure. The within-participants independent variable was type of loanword (Anglicism or Latinism/Grecism).

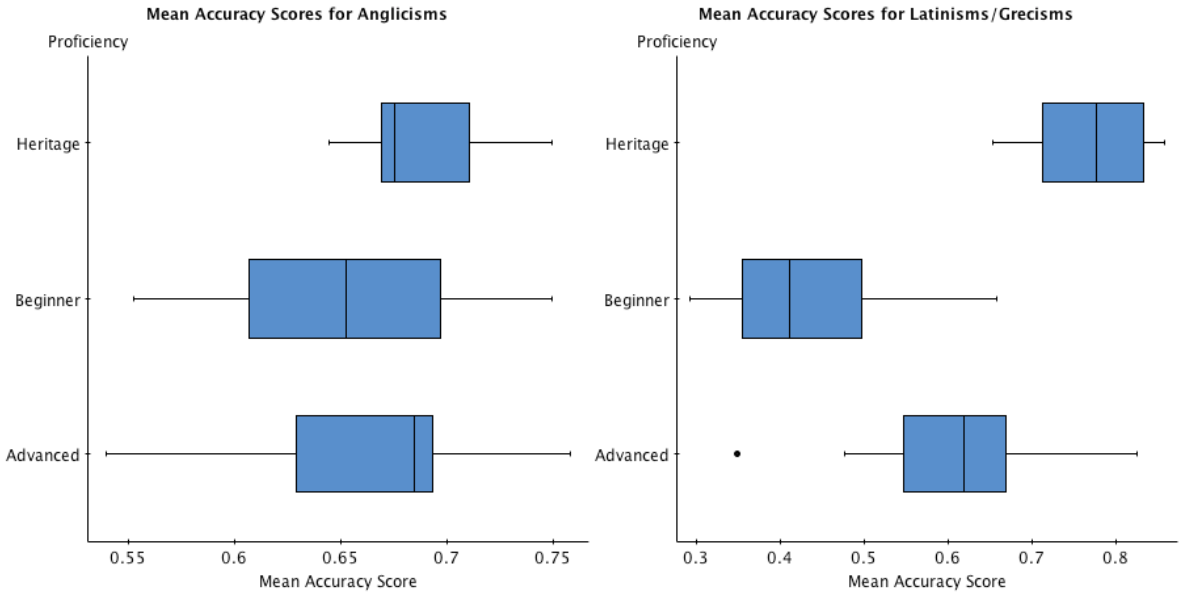

Figure 5.1 Distribution of mean accuracy scores in the initial analysis

The main effect of loanword type was significant in mean accuracy scores, $F(1,112) = 36.46$, $MSe = 0.0129$, $p < 0.0001$. The heritage speaker group followed the expected pattern, producing Latinisms and Grecisms more accurately (M=0.7685) than Anglicisms (M=0.6871), $F(1,10) = 5.41$, $MSe = 0.0037$, $p = 0.0423$. For the advanced group, however, Anglicisms were produced more accurately (M=0.6670) than Latinisms and Grecisms (M=0.6142), $F(1,40) = 4.42$, $MSe = 0.0066$, $p = 0.0419$. Similarly, the beginner group produced the Anglicisms more accurately (M=0.6543) than the Latinisms and Grecisms (M=0.4309), $F(1,58) = 123.06$, $MSe = 0.0061$, $p < 0.0001$.

Independent-samples t-tests comparing the mean accuracy scores of both groups of loanwords were conducted for the following conditions: beginner group and full advanced group, advanced group and heritage speaker group, and advanced group and beginner group. Significant effects of proficiency were only present for the Latinisms and Grecisms. The advanced group (M=0.6142, SD=0.1022) was more accurate with these than the beginner group (M=0.4309,

SD=0.0953), $t(48.13) = 7.45$, $p < 0.0001$, the heritage speaker group (M=0.7685, SD=0.0773) was more accurate than the advanced group, $t(10.58) = 3.99$, $p = 0.0023$, and the full advanced group (M=0.6485, SD=0.1160) was more accurate than the beginner group, $t(50.49) = 7.69$, $p < 0.0001$.

Initial results appear to support the hypothesis that the production accuracy of Anglicisms will progress more slowly than that of the Latinisms and Grecisms as proficiency increases. Figure 5.2 depicts this.

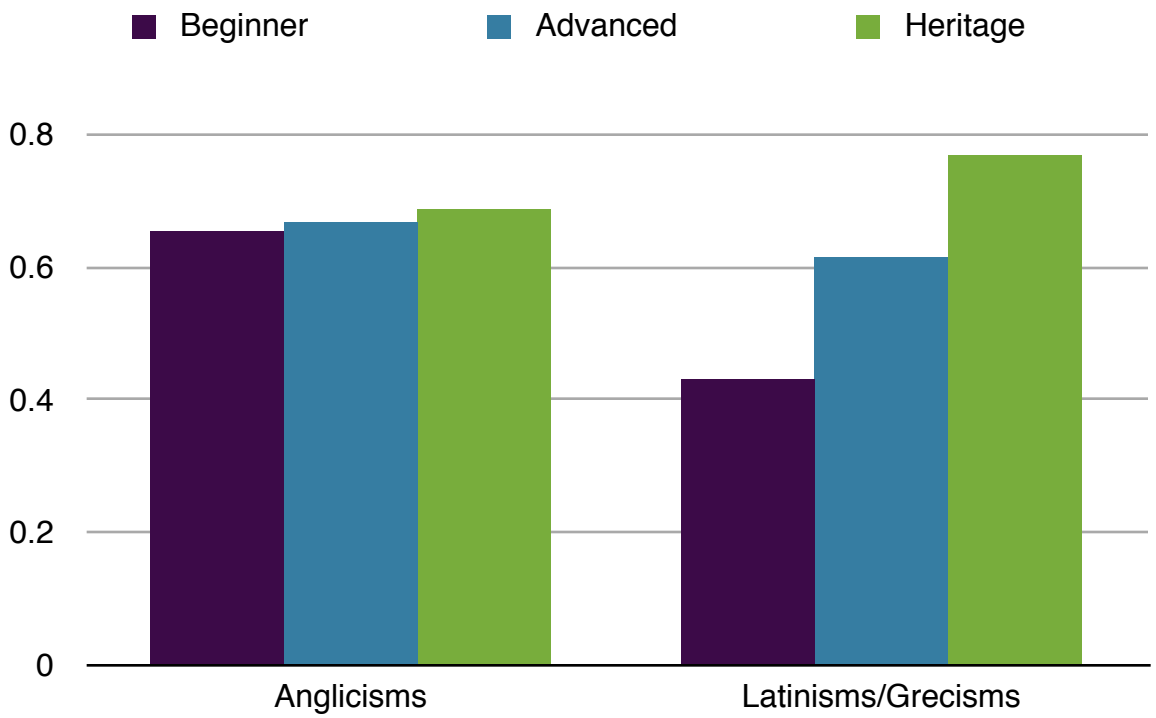

Figure 5.2 Mean cross-proficiency production accuracy of Anglicisms and Latinisms/Grecisms

The data do not, however, support the hypothesis that Anglicisms will be produced less accurately than than Latinisms and Grecisms – both the advanced and beginner groups produced Anglicisms much more accurately (Figure 5.3).

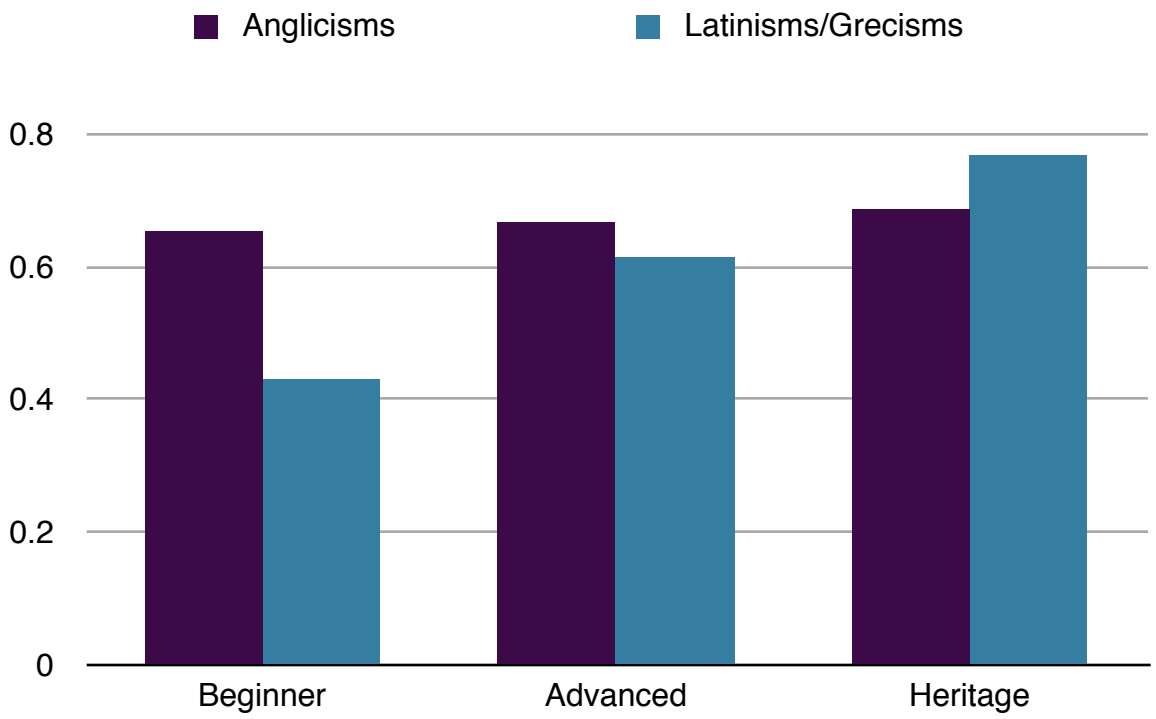

Figure 5.3 Mean within-proficiency production accuracy of Anglicisms and Latinisms/Grecisms

Despite the comparatively slower progression of production accuracy for Anglicisms, it seemed imprudent to interpret this as evidencing greater difficulty, in light of the trend for producing these with greater accuracy than the Latinisms and Grecisms. To investigate this, the test materials were analyzed, and it was noted that a high number of potentially ambiguous grapheme-phoneme-correspondences could, by defaulting to the English pronunciation – a practice that was quite common among participants upon encountering a cognate – result in the inadvertent production of a phoneme that would be coded as correct in the coding schema, and that this might artificially inflate the accuracy scores. For example, consider the word *Action,* the prescribed pronunciation of which is /ɛkʃn/. While a participant applying the German grapheme-phoneme-correspondences will arrive at /aktsjon/, with [a] corresponding to ⟨a⟩ and [tsjo] to ⟨tio⟩ – both being incorrect – one defaulting to English will produce /ækʃn/, with [æ] incorrectly

corresponding to ⟨a⟩, but the [ʃ] correctly corresponding to ⟨tio⟩, albeit inadvertently. To account for such occurrences, the data were reanalyzed accordingly.

5.7. Reanalysis and Results

In order to account for the prevalence of grapheme-phoneme-correspondences which could result in the inadvertently correct production of a phoneme by use of the English pronunciation, the data were reanalyzed excluding all grapheme-phoneme-correspondences in which the English pronunciation would result in a pronunciation that would be coded as correct, and those for which the prescribed pronunciation permitted two variants, one of which being a phoneme used in the English pronunciation. Results are depicted in Figure 5.4.

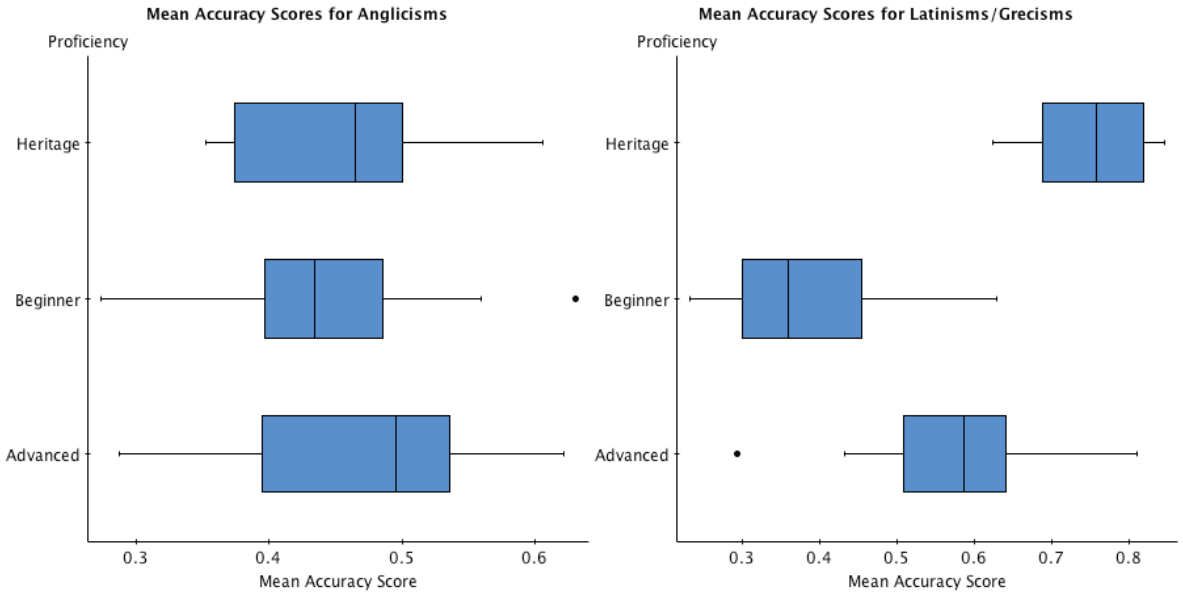

Figure 5.4 Distribution of mean accuracy scores, excluding grapheme-phoneme-correspondences in which defaulting to English pronunciation results in the inadvertent production of a phoneme considered correct

Separate repeated measures of analyses of variance (ANOVAs) were conducted using proficiency as the independent variable and mean accuracy score as the dependent measure. The within-participants independent variable was type of loanword (Anglicism or Latinism/Grecism).

The main effect of loanword type was non-significant in this analysis, $F(1,112) = 3.35$, $MSe = 0.0173$, $p = 0.0698$. The heritage speaker group produced the Latinisms and Grecisms much more accurately (M=0.7490) than the Anglicisms (M=0.4605), $F(1,10) = 32.38$, $MSe = 0.0077$, $p = 0.0002$. Advanced speakers also produced the Latinisms and Grecisms more accurately (M=0.5821) than the Anglicisms (0.4681), $F(1,40) = 12.68$, $MSe = 0.0108$, $p = 0.001$. The beginners, unlike the advanced and heritage groups, produced the Latinisms and Grecisms less accurately (M=0.3833) than the Anglicisms (M=0.4351), $F(1,58) = 4.71$, $MSe = 0.0086$, $p = 0.0341$.

Independent-samples t-tests comparing the mean accuracy scores of both groups of loanwords were conducted for the conditions beginner group and full advanced group, advanced group and heritage speaker group, and advanced group and beginner group. Again, there were only significant effects of proficiency for the Latinisms and Grecisms. The advanced group produced these more accurately (M=0.5821, SD=0.1107) than the beginner group (M=0.3833, SD=0.1033), $t(41.25) = 6.49$, $p < 0.0001$. The full advanced group was also more accurate with Latinisms and Grecisms (M=0.6192, SD=0.1256) than the beginner group, $t(50.51) = 7.70$, $p < 0.0001$. Within the full advanced group, the heritage speakers produced Latinisms and Grecisms more accurately (M=0.7490, SD=0.0836) than the advanced group, $t(10.59) = 3.99$, $p = 0.0023$.

As in the initial analysis, the hypothesis that the production accuracy of Anglicisms will improve more slowly with proficiency than that of the Latinisms and Grecisms is supported (Figure 5.5).

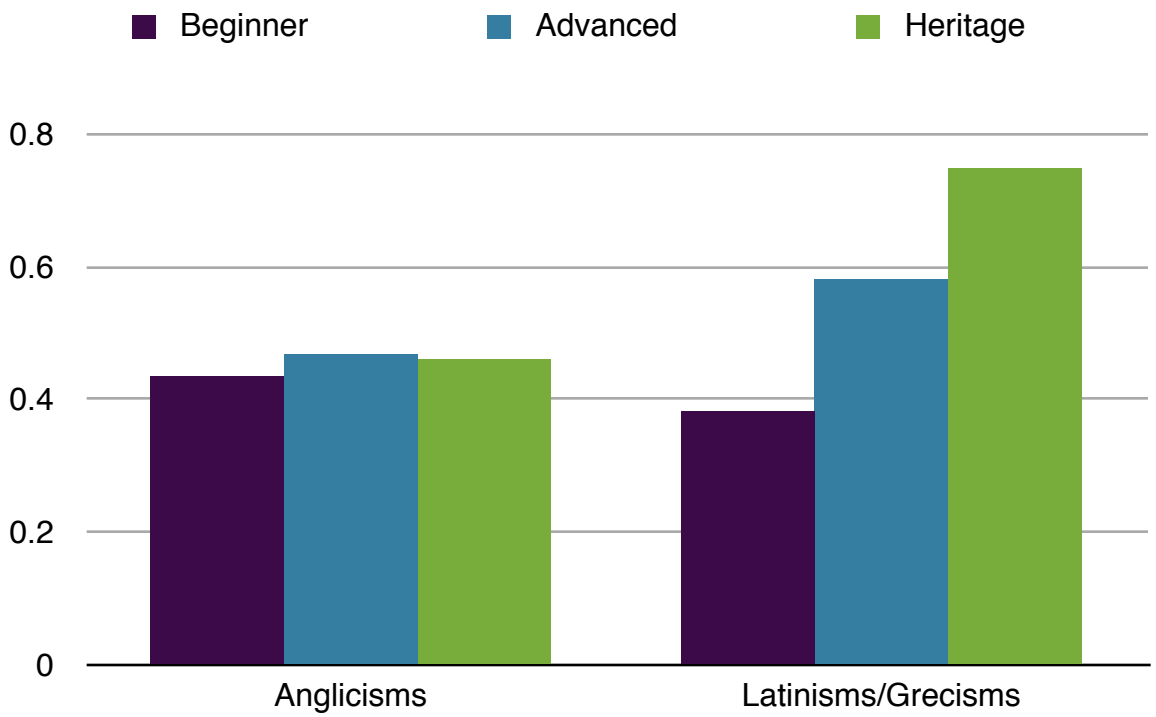

Figure 5.5 Mean cross-proficiency production accuracy of Anglicisms and Latinisms/Grecisms, excluding grapheme-phoneme-correspondences in which defaulting to English pronunciation results in the inadvertent production of a phoneme considered correct

In fact, the heritage speakers even produce Anglicisms less accurately than the advanced group, whereas they are significantly more accurate in their production of Latinisms and Grecisms than this group. Note, however, that the latter observation is of highly limited generalizability due to the small population sizes of the advanced and heritage groups, and the exploratory nature of this study. The hypothesis that the Anglicisms will be produced less accurately than the Latinisms and Grecisms also receives support from the data, though not as strong as with the other hypothesis (Figure 5.6).

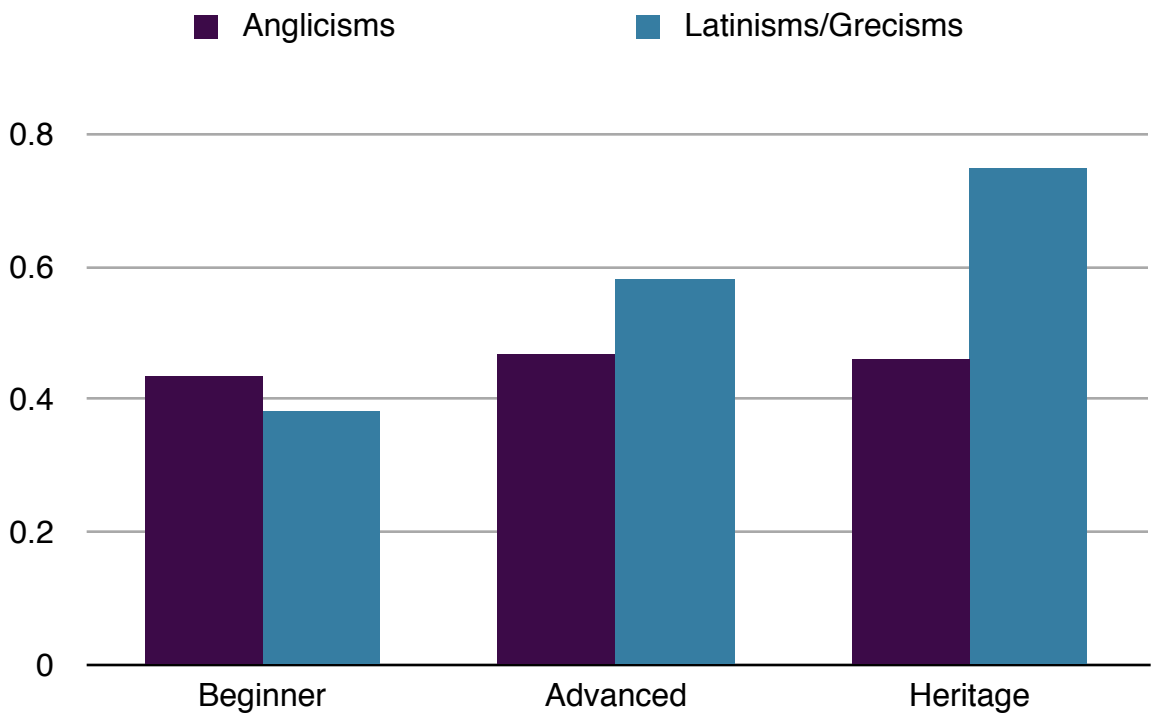

Figure 5.6 Mean within-proficiency production accuracy of Anglicisms and Latinisms/Grecisms, excluding grapheme-phoneme-correspondences in which defaulting to English pronunciation results in the inadvertent production of a phoneme considered correct

Both the advanced and heritage groups produced Latinisms and Grecisms more accurately than the Anglicisms. This difference also became quite robust in the heritage group. Conversely, the beginner group produced Anglicisms more accurately than the Latinisms and Grecisms. This need not invalidate the hypothesis, however. It is possible that this result is an artifact of the learning process, the materials used, or a combination of the two. A more refined analysis which also takes into account the production accuracy of native German words might reveal more, in addition to which data from intermediate speakers should be collected to aid in the elucidation of any learning patterns.

5.8. Conclusion of Study

Results of this exploratory study reveal that the production accuracy for Anglicisms progresses more slowly with increased proficiency than that of the Latinisms and Grecisms, and that Anglicisms are produced less accurately than Latinisms and Grecisms by advanced and heritage speakers, though the reverse is true of beginners. Additionally, when the individual groups are amalgamated and analyzed holistically, Anglicisms are produced less accurately (M= 0.4499, SD=0.0875) than the Latinisms and Grecisms (M=0.4950, SD=0.1642), though this does not reach significance. Together, these results suggest that Anglicisms are indeed a source of greater and persistent difficulty for English-dominant learners of German as regards pronunciation. Further research is necessary to refine our understanding of this issue.

6. General Discussion

The above study has provided evidence that Anglicisms are a source of greater difficulty for English-dominant learners of German in regards to pronunciation, and that this difficulty is persistent across proficiency. Additionally, the consideration of data from English-dominant learners whose L1s are not necessarily English indicates that these difficulties may not be exclusive to L1-English learners. The implications of these findings will now be discussed.

6.1. Acquisitional Implications

Following Lennon's 'narrow' concept of fluency (2000: 25), Hilton regards fluency in a language as "the number and length of pauses and other hesitations, their distribution, and the temporal rate at which words are produced" (2008: 154). Temporal fluency was measured in her study based on speech rate, words per minute, mean length of run, percentage of speaking time spent in hesitation, mean length of hesitation, rate of hesitation, rate of retracing, and rate of error (155-156). Hesitations lasting more than three second were considered disfluent (158). An analysis of disfluent clause-internal hesitations revealed that 78.3% of hesitations were immediately followed by either a lexical error or lexical search, indicating that a clear majority of disfluencies in L2 speech appear to result from incomplete lexical knowledge.

Considering the difficulty determining the pronunciation of Anglicisms for English-dominant learners of German, it is likely that their attempts to ascertain pronunciation result in pauses such as those observed in the analysis of the *PAROLE* corpus. Thus, the difficulty

associated with Anglicisms may manifest itself in disfluencies in spoken discourse, in which a learner may need to pause to consider the pronunciation of an Anglicism, or experience a false start and need to correct himself.

These disfluencies and pronunciation errors may further have affective implications. Noticeable difficulty with particular words may become demotivating if persistent with increasing proficiency. It may also lead to a self-consciousness when required to produce these words and even result in a conscious effort to avoid their production. Given the importance of affect, and particularly motivation, in second language acquisition, there is also a potential for overall poorer performance in and acquisition of German to arise as a consequence. Additionally, there may be social implications for immigrants and other language learners with integrative motivations – particularly if persistent false pronunciation of Anglicisms results in an evident foreign accent.

In her discussion on phonology in SLA, Saville-Troike (2006) remarks that:

> As a component of interpersonal competence, proficiency in phonological perception and intelligible production are essential for successful spoken communication, but a significant degree of "foreign accent" is acceptable in most situations as long as it is within the bounds of intelligibility. Native or near-native pronunciation is usually needed only when learners want to identify socially with the L2 language community for affective purposes, or when their communicative goals require such identification by hearers.
>
> (143)

Thus, the extent to which these difficulties are an issue, and in how far they need to be addressed in the classroom, is ultimately dependent upon the learners' goals.

Consider, however, learners whose instrumental motivation is to become language teachers, and would therefore require native or near-native identification by hearers. In a review of second language instruction in Alberta Learning systems, the *Enhancing Second Language Learning Project* (2003) recognized the importance of second language teachers who possess "advanced proficiency in the language they teach" (4), and recommended that Alberta Learning "explore and implement strategies to increase the supply of qualified second language teachers who possess […] target language proficiency" (13). An important caveat to this, however, is that Alberta Learning neither had nor has defined proficiency levels, which led the review committee to recommend that "Alberta Learning […] define a set of proficiency levels appropriate to each language program offered" (14). In furtherance of this, the review refers to both the *ACTFL Proficiency Guidelines* (25-30) and the Council of Europe's common framework (31) as examples of possible language proficiency definitions. This brings little clarity, however, as to what advanced proficiency might be, as both guidelines use different systems in defining proficiency. Referring to the 2012 *ACTFL Proficiency Guidelines* and the *Common European Framework of Reference* (2001), both guidelines regard fluency and spontaneity as defining aspects of speakers in the higher proficiency levels – C1 and C2 for the *CEFR* (24) and Advanced Mid, Advanced High, Superior and Distinguished for the *ACTFL Proficiency Guidelines* (4-6). Thus, although it is unclear what advanced proficiency might be, if teachers are to possess this, they will necessarily require fluency in their respective languages. In light of the results of the study discussed in Chapter Five and their potential implications for fluency and

affect, and given that it is not feasible to have separate classes for students wishing to become language instructors, it is therefore necessary that these cognates be addressed in textbooks and instruction in order for learners to adequately learn their pronunciation, and afford them the greatest possible chance of achieving an advanced proficiency level, particularly for learners with integrative goals or for those who aim to become instructors in that language.

6.2. Didactic Implications

In order to address the difficulties posed by Anglicisms to English-dominant learners of German, textbooks might include units on Anglicisms to make students aware of their existence and varying pronunciations in German, and instructors may wish to consult reference works such as *Duden* to ensure that they are familiar with the proper pronunciation of these words and can model them for students. Additionally, lesson plans would need to be designed and appropriate strategies identified for introducing and promoting the development of accurate production of Anglicisms (for an example of how one might address Anglicisms in the classroom, see Barbe, 2004).

Research suggests that strategies making use of multimodal input may be effective in addressing Anglicisms. For example, studies have indicated that linguistic performance is best in the same modality as that of the input (Dodd et al., 1988; Nelson et al., 2005; Bird & Williams, 2002). This suggests that a strategy using auditive and visual input would be beneficial to learners. One such strategy being increasingly used is simultaneous reading and listening. Brown et al. (2008) studied the acquisition rates of English words by Japanese learners under three

different conditions: Reading, listening, and simultaneous reading and listening. Following the input task, the participants were tested using multiple choice and meaning translation to determine if and how precisely they had acquired the meanings of the test-words. Brown et al. found that the acquisition rates were highest with simultaneous reading and listening and lowest with listening alone. This result implies that word learning occurs more successfully when multiple modalities are utilized. It was further found that the participants performed better in the multiple choice test than in the meaning translation task, and that performance on multiple choice was relatively stable over time, whereas it decreased over time in the translation task. Brown et al. concluded that "prompted-meaning recognition knowledge is better retained than […] unprompted knowledge" (151). This study demonstrates that input, both visual and auditive, is sufficient to increase P and CA vocabulary sizes, but not to bring these words into the FA domain. Although the exact advantage to learning orthographic and phonological forms through simultaneous contact with both forms is unclear in these studies, it is nonetheless feasible that simultaneous contact would promote the establishment of a connection between both forms, which would be particularly beneficial in the case of ambiguous grapheme-phoneme-correspondences.

In a study on word-learning by means of videos with and without subtitles, Sydorenko (2010) demonstrated that L2 word-meaning is learned with greater success when occurring through a combination of auditive and visual modalities than when delivered through just one of these modalities. The results were initially interpreted as evincing a facilitating role of subtitles in the recognition of words' orthographic forms. Further analysis, however, revealed no effect of modality of input on form-recognition. Nevertheless, it remains plausible that a combination of

these modalities would facilitate the noticing of the phonological form of an available orthographic form, in that the orthographic forms and the meanings of a loaned cognate would already be known to the learners. Further research in this area is needed.

One additional, promising strategy for vocabulary acquisition and the development of lexical and communicative competences is *Computer Assisted Language Learning* (CALL). A study by Tozcu & Coady (2004) on word learning with CALL found that learners who used CALL to learn high frequency words learned significantly more words than the control group. Liu (2009) explains that CALL also allows greater access to authentic visual and auditive material (62). This permits a greater chance to notice new words and increase the size of the P vocabulary, while the increased authentic input promotes the noticing of the phonological forms, enabling the learners to modify their IL.

Finally, learners should also be encouraged to produce Anglicisms in the classroom. In a study on the role of input and output in vocabulary acquisition, De la Fuente (2002) found that input and negotiation of meaning with the input leads to a better understanding of L2 words than input alone. It was further found that a combination of this negotiation of meaning with pushed output is even more effective in the development of productive competences. These results support Long's (1981) *interaction hypothesis* and indicate that input alone is insufficient for the development of one's lexical competence. Interaction and output are necessary to bring the passive and controlled active vocabularies into the domain of the free active vocabulary, and as such develop the lexical and communicative competences. This combination of input, output and interaction – that is, communication – would also provide learners with the chance to note and learn the proper phonological forms of cognates which are not orthographically integrated.

Because communication would promote the actual production of these words by the learners, instructors would also gain the opportunity to hear and correct pronunciation errors.

7. Conclusion

This paper has made clear the potential challenge for L1-English learners of German when encountering Anglicisms in German. The ambiguous grapheme-phoneme-correspondences of these words resulting from their integration into German give rise to unclear pronunciations, which psycholinguistic research suggests would be more pronounced and prolonged in L1-English speakers. The results of the study discussed in Chapter Five revealed that cognate Anglicisms are produced overall less accurately than cognate Latinisms and Grecisms, and that this is persistent with increased proficiency, thus providing evidence that cognate Anglicisms are a greater source of difficulty not only for L1-English learners of German, but more generally for English-dominant learners. Chapter Six contextualized these findings to illustrate the potential acquisitional and didactic implications of this difficulty. Considering the current prevalence of Anglicisms in German, and given the proficiency orientation's emphasis on authentic communication and the development of proficiency, it is evident that cognate Anglicisms must be addressed in instruction if students are to attain advanced proficiency.

In order to further refine our understanding of Anglicisms and the challenges they pose to the acquisition of German for English-dominant learners, future research might compare the progression of production accuracy for Anglicisms to that of native-German words, in addition to analyzing data from intermediate and possibly superior proficiency levels. Furthermore, research similar to that of Hilton's (2008) could analyze temporal fluency to ascertain whether pauses might occur more frequently immediately preceding Anglicisms, and add another dimension to the definition of difficulty used in Chapter Five's study. Additionally, suggestions were made on

how Anglicisms might be addressed in instruction, and future research may also aim to evaluate the effectiveness of strategies implemented to teach Anglicisms.

Finally, it is important to note that the conclusions of this paper do not just concern English-dominant learners of German, but may be relevant to learners dominant in languages other than English who also speak English, to L1 speakers of other languages learning German who do not speak English, and more generally to L2 learners of any language. Thus, future research should seek to ascertain if and where such difficulties exist so that they, too, can be addressed in language pedagogy.

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Appendix A

Study Materials: Test Words

Anglicisms

Action (die)
Blockbuster (der)
Campus (der)
Catwalk (der)
Computer (der)
Cookie (der/das)
E-mail (die)
Gig (der)
Job (der)
Laptop (der)
live
Manager (der)
Muffin (der)
Popcorn (das)
Pub (das/der)
Rapper (der)
Reader (der)
Sandwich (das/der)
Smartphone (das)
Song (der)
Star (der)
Thriller (der)
Trailer (der)
Website (die)

Latinisms

Argument (das)
Depression (die)
Humor (der)
Holocaust (der)
Hotel (das)
Information (die)
international
Position (die)
Professor (der)
Radio (das)

Region (die)
Semester (das)
Seminar (das)
Situation (die)
Student (der)
Text (der)

Grecisms

Charisma (das)
Museum (das)
Problem (das)
System (das)
Theater (das)

Appendix B

Study Materials: Passages

Peter und Anna gehen in die Bibliothek. Sie wollen ein Buch über **Theater** finden, weil sie darüber ein Projekt in der Schule machen. Weil man in der Bibliothek lesen möchte, reden sie sehr leise mit einander. Sie fragen die Bibliothekarin, wo sie solch ein Buch über **Theater** finden können. Die Bibliothekarin sagt ihnen, dass die **Computer** abgestürzt sind und das ganze **System** funktioniert zur Zeit nicht. Das ist aber kein **Problem**, weil sie weiß wo die Theaterbücher sind. Zum Glück finden Peter und Anna das perfekte Buch für ihr Schulprojekt.

Meine Mutter kann sehr gut backen. Sie backt Kuchen, **Muffins**, **Cookies** und Brot. Jeden Tag macht sie ein leckeres **Sandwich** für mich mit ihrem frisch gebackenen Brot. Backen ist für meine Mutter ein großes Vergnügen. Ich finde es ganz schön, dass sie es genießt.

Ich gucke gern Filme an. Ich gehe jedes Wochenende ins Kino, um den neusten **Blockbuster** zu sehen. Jedes mal kaufe ich ein großes **Popcorn**. Ich mag die **Trailers** auch. Der beste Film, den ich letztes Jahr gesehen habe, war “Hanna”. Dieser Film ist ein **Thriller** mit Spannung, Abenteuer und viel **Action**. Obwohl es keine Explosionen gab, war der Film doch richtig gut! Ich würde den Film unbedingt empfehlen.

Dieses **Semester** habe ich mein erstes **Seminar**. Es gibt nur zehn Leute in dem Kurs. Wir brauchen auch kein Lehrbuch, sondern es gibt einen **Reader**, den wir photokopieren dürfen. Den sollten wir aber nicht auf dem Campus photokopieren, wegen den neuen Gesetzen. Ich finde dies toll, weil Lehrbücher richtig teuer sind.

Liv Tyler ist die Tochter von Steve Tyler. Sie ist eine Schauspielerin und ein Modell. Liv wurde **international** bekannt nach der Trilogie “Der Herr der Ringe”. Liv wird als ein **Star** im Film und auf dem **Catwalk** anerkannt. Sie wurde nach der norwegischen Schauspielerin Liv Ullman benannt.

Ich arbeite gerade als **Manager** eines **Hotels** in München. Gäste fragen mich oft, was es in der Stadt und in der **Region** zu tun gibt. Ich empfehle immer die Altstadt und das deutsche **Museum**. Es gibt auch Schloss Neuschwanstein und das Konzentrationslager Dachau in der Nähe von München. Ich mag diesen **Job** sehr, weil ich gern mit Leuten arbeite.

Der Kandidat hat seine Rede mit **Charisma** und Gefühlen gegeben. Das **Argument** für seine **Position** war überzeugend und die **Information** zur Unterstützung wurde logisch geliefert. Ich glaube, dass er die Wahl gewinnt.

Ich muss einen neuen **Laptop** kaufen, weil mein alter kaputt ist. Ich möchte, dass der neue klein, leicht und hübsch ist. Er muss auch mit meinem **Smartphone** kompatibel sein. Ich habe aber wenig Geld. Kennst du eine gute **Website**, bei der man billige Laptops kaufen kann?

Ich finde **Humor** sehr wichtig. Die Fähigkeit, in einer bestimmten **Situation** über etwas zu lachen, sagt viel über einen Menschen. Auch wenn man auf ein **Problem** trifft, sollte man versuchen, etwas Lustiges daran zu finden. Wenn man nicht lachen kann, könnte das auf **Depression** hindeuten.

Nana ist ein deutscher **Rapper**, der in Ghana geboren wurde. Seine Lieder haben viel mit Gott, Familie, Rassismus und dem **Holocaust** zu tun. Nana zog mit zehn Jahren nach Deutschland um und ist seitdem sehr berühmt und erfolgreich geworden. Sein erster **Song** mit deutschem **Text** war “Du wirst sehen”.

Unser **Professor** ist ein lockerer Typ. Er hat uns gestern eine **E-Mail** geschickt, in der er uns heute Abend zu einem **Pub** eingeladen hat. Dort werden wir Bier mit unserem **Professor** trinken. Um 19:00 Uhr gibt es auch einen live **Gig** von einem Studenten an unserer Universität. Der **Student** spielt Gitarre und singt sehr gut. Einige von seinen Liedern werden auch im **Radio** gespielt.

Appendix C

Coding Schema

The following is the coding schema that was used to code pronunciations. The top, bolded letters represent the individual graphemes of each word. The first set of characters in square brackets beneath these represent the phonemes corresponding to each grapheme according to the prescribed German pronunciation of each word. The empty square brackets are where pronunciations considered "other" were marked. The third set contains the phonemes corresponding to each grapheme according to the prescribed English pronunciation for each word. Pronunciations are only marked where the correspondences in German and English differ, where a non-German grapheme is concerned, and where environmentally conditioned variants exist. The final page portrays how the pronunciations were then tallied.

TH	**E**	**A**	**T**	**ER**
[t]	[e]	[a]	[t]	[ɐ]
[ ]	[ ]	[ ]	[ ]	[ ]
[θ]	[i]		[ɾ]	[ə̯]

C	**O**	**M**	**P**		**U**	**T**	**ER**
[k]	[ɔ]	[x]	[x]	[j]	[x]	[t]	[ɐ]
[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]
[x]	[ə]	[x]	[x]	[j]	[x]	[ɾ]	[ə̯]

S	**Y**	**S**	**T**	**E**	**M**
[z]	[Y]	[s]	[x]	[e]	[x]
[ ]	[ ]	[ ]	[ ]	[ ]	[ ]
[s]	[ɪ]	[x]	[x]	[ə]	[x]

P	**R**	**O**	**B**	**L**	**E**	**M**
[x]	[r]	[o]	[x]	[x]	[e]	[x]
[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]
[x]	[ɹ]	[ɒ]	[x]	[x]	[ə/ɪ/ɛ]	[x]

M	**U**	**FF**	**I**	**N**	**S**
[x]	[a]	[x]	[ɪ]	[x]	[s]
[ ]	[ ]	[ ]	[ ]	[ ]	[ ]
[x]	[ʌ]	[x]	[ɪ]	[x]	[z]

C	**OO**	**K**	**IE**	**S**
[k]	[ʊ]	[x]	[x]	[s]
[ ]	[ ]	[ ]	[ ]	[ ]
[x]	[x]	[x]	[x]	[z]

S	**A**	**N**	**D**	**W**	**I**	**CH**
[z]	[ɛ]	[x]	[t]	[v]	[ɪ]	[ʧ]
[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]
[s]	[æ]	[m]	[d]	[w]	[x]	[x]

B	**L**	**O**	**CK**	**B**	**U**	**S**	**T**	**ER**
[x]	[x]	[ɔ]	[x]	[x]	[ʌ]	[x]	[x]	[ɐ]
[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]
[x]	[x]	[x]	[x]	[x]	[x]	[x]	[x]	[ə˞]

P	**O**	**P**	**C**	**O**	**R**	**N**
[x]	[ɔ]	[x]	[k]	[ɔ]	[ʌ̹]	[x]
[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]
[x]	[x]	[x]	[x]	[o]	[ɹ]	[x]

T	**R**	**AI**	**L**	**ER**	**S**
[t]	[r]	[e]	[x]	[ɐ]	[s]
[ ]	[ ]	[ ]	[ ]	[ ]	[ ]
[ʧ]	[ɹ]	[x]	[x]	[ə˞]	[z]

TH	**R**	**I**	**LL**	**ER**
[θ]	[ɾ]	[ɪ]	[x]	[ɐ]
[ ]	[ ]	[ ]	[ ]	[ ]
[x]	[ɻ]	[x]	[x]	[ɚ]

A	**C**	**TIO**	**N**
[ɛ]	[k]	[ʃ]	[x]
[ ]	[ ]	[ ]	[ ]
[æ]	[x]	[x]	[x]

S	**E**	**M**	**E**	**S**	**T**	**ER**
[z]	[e]	[x]	[ɛ]	[s]	[x]	[ɐ]
[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]
[s]	[ə/ɛ/ɪ]	[x]	[x]	[x]	[x]	[ɚ]

S	**E**	**M**	**I**	**N**	**A**	**R**
[z]	[e]	[x]	[i]	[x]	[a]	[ʌ̽]
[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]
[s]	[ɛ]	[x]	[ɪ/ə]	[x]	[ɒ]	[ɻ]

R	**EA**	**D**	**ER**
[ɾ]	[i]	[d]	[ɐ]
[ ]	[ ]	[ ]	[ ]
[ɻ]	[x]	[ɾ]	[ɚ]

C	**A**	**M**	**P**	**U**	**S**
[k]	[a/ɛ]	[x]	[x]	[ʊ/ə]	[x]
[ ]	[ ]	[ ]	[ ]	[ ]	[ ]
[x]	[æ]	[x]	[x]	[x]	[x]

I	**N**	**T**	**ER**	**N**	**A**	**T**	**IO**	**N**	**A**	**L**
[ɪ]	[x]	[x]	[ɐ]	[x]	[a]	[ʦ]	[jo]	[x]	[a]	[x]
[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]
[x]	[x]	[ɾ̃]	[ə̯]	[x]	[æ]	[ʃ]	[ə]	[x]	[ə]	[x]

S	**T**	**A**	**R**
[s/ʃ]	[x]	[a]	[ʌ̯]
[ ]	[ ]	[ ]	[ ]
[x]	[x]	[ɒ]	[ɻ]

C	**A**	**T**	**W**	**A**	**LK**
[k]	[ɛ]	[x]	[v]	[o/ɔ]	[k]
[ ]	[ ]	[ ]	[ ]	[ ]	[ ]
[x]	[æ]	[x]	[w]	[x]	[x]

M	**A**	**N**	**A**	**G**	**ER**
[x]	[ɛ]	[x]	[ɪ]	[ʤ]	[ɐ]
[ ]	[ ]	[ ]	[ ]	[ ]	[ ]
[x]	[æ]	[x]	[ə]	[x]	[ə̯]

H	**O**	**T**	**E**	**L**	**S**
[x]	[o]	[t]	[ɛ]	[x]	[s]
[ ]	[ ]	[ ]	[ ]	[ ]	[ ]
[x]	[x]	[x]	[x]	[x]	[z]

R	**E**	**G**	**IO**	**N**
[r]	[e]	[g]	[jo]	[x]
[ ]	[ ]	[ ]	[ ]	[ ]
[ɻ]	[i]	[ʤ]	[ə]	[x]

M	**U**	**S**	**E**	**U**	**M**
[x]	[u]	[z]	[e]	[ʊ]	[x]
[ ]	[ ]	[ ]	[ ]	[ ]	[ ]
[x]	[ju]	[x]	[i]	[ə]	[x]

J	**O**	**B**
[ʤ]	[ɔ]	[p]
[ ]	[ ]	[ ]
[x]	[x]	[b]

CH	**A**	**R**	**I**	**S**	**M**	**A**
[ç/k]	[a]	[r]	[ɪ]	[s]	[x]	[a]
[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]
[x]	[ə]	[ɻ]	[x]	[z]	[x]	[ə/ʌ]

A	**R**	**G**	**U**	**M**	**E**	**N**	**T**
[a]	[ʌ̂]	[x]	[u]	[x]	[ɛ]	[x]	[x]
[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]
[ɒ]	[ɻ]	[x]	[ju]	[x]	[ə]	[x]	[x]

P	**O**	**S**	**I**	**T**	**IO**	**N**
[x]	[o]	[z]	[i]	[ʦ]	[jo]	[x]
[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]
[x]	[ə]	[x]	[ɪ]	[ʃ]	[ə]	[x]

I	**N**	**F**	**O**	**R**	**M**	**A**	**T**	**IO**	**N**
[ɪ]	[x]	[x]	[ɔ]	[ʌ̂]	[x]	[a]	[ʦ]	[jo]	[x]
[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]
[x]	[x]	[x]	[ɚ]	[ɻ]	[x]	[eɪ]	[ʃ]	[ə]	[x]

L	**A**	**P**	**T**	**O**	**P**
[x]	[ɛ]	[x]	[x]	[ɔ]	[x]
[ ]	[ ]	[ ]	[ ]	[ ]	[ ]
[x]	[æ]	[x]	[x]	[x]	[x]

S	**M**	**A**	**R**	**T**	**PH**	**O**	**N**	**E**
[s]	[x]	[a]	[ʌ̂]	[x]	[f]	[o]	[x]	[ø]
[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]
[x]	[x]	[ɒ]	[ɻ]	[x]	[x]	[x]	[x]	[x]

W	**E**	**B**	**S**	**I**	**T**	**E**
[v/w]	[ɛ]	[p/b]	[s]	[ai]	[x]	[ø]
[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]
[x]	[x]	[x]	[x]	[x]	[x]	[x]

H	**U**	**M**	**O**	**R**
[x]	[u]	[x]	[o]	[ʌ̂]
[ ]	[ ]	[ ]	[ ]	[ ]
[x]	[ju]	[x]	[ə˞]	[x]

S	**I**	**T**	**UA**	**T**	**IO**	**N**
[z]	[i]	[t]	[wa]	[ʦ]	[jo]	[x]
[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]
[s]	[ɪ]	[ʧ]	[ju]	[eɪ]	[ʃ]	[ə]	[x]

D	**E**	**P**	**R**	**E**	**SS**	**IO**	**N**
[x]	[e]	[x]	[r]	[ɛ]	[s]	[jo]	[x]
[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]
[x]	[ə/ɪ]	[x]	[ɻ]	[x]	[ʃ]	[ə]	[x]

R	**A**	**PP**	**ER**
[r]	[ɛ]	[x]	[ɐ]
[ ]	[ ]	[ ]	[ ]
[ɻ]	[æ]	[x]	[ə˞]

H	**O**	**L**	**O**	**C**	**AU**	**S**	**T**
[x]	[o]	[x]	[o]	[k]	[au]	[s]	[x]
[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]
[x]	[ɒ]	[x]	[ə]	[x]	[ɒ/ɔ]	[x]	[x]

S	**O**	**NG**
[z]	[ɔ]	[x]
[ ]	[ ]	[ ]
[s]	[x]	[x]

T	**E**	**X**	**T**
[x]	[ɛ]	[x]	[x]
[ ]	[ ]	[ ]	[ ]
[x]	[x]	[x]	[x]

P	**R**	**O**	**F**	**E**	**SS**	**O**	**R**
[x]	[r]	[o]	[x]	[ɛ]	[x]	[o]	[ʌ̯]
[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]
[x]	[ɻ]	[ə]	[x]	[x]	[x]	[ə˞]	[x]

E	**-**	**M**	**AI**	**L**
[i]		[x]	[e]	[x]
[ ]		[ ]	[ ]	[ ]
[x]		[x]	[x]	[x]

P	**U**	**B**
[x]	[a]	[p]
[ ]	[ ]	[ ]
[x]	[ʌ]	[b]

L	**I**	**V**	**E**
[x]	[ai]	[f]	[ø]
[ ]	[ ]	[ ]	[ ]
[x]	[x]	[v]	[x]

G	**I**	**G**
[x]	[ɪ]	[k]
[ ]	[ ]	[ ]
[x]	[x]	[g]

S	**T**	**U**	**D**	**E**	**N**	**T**
[ʃ]	[x]	[u]	[d]	[ɛ]	[x]	[x]
[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]
[s]	[x]	[x]	[ɾ]	[ə]	[x]	[x]

R	**A**	**D**	**IO**
[r]	[a]	[d]	[jo]
[ ]	[ ]	[ ]	[ ]
[ɻ]	[eɪ]	[ɾ]	[ioʊ]

Anglicisms

⟨c⟩ : [k] (6)
⟨o⟩ : [ɔ] (6)
⟨(p)u⟩ : [j(u)] (1)
⟨t⟩ : [t] (2)
⟨er⟩ : [ɐ] (7)
⟨u⟩ : [a] (2)
⟨i⟩ : [ɪ] (4)
⟨s⟩ : [s] (5)
⟨oo⟩ : [ʊ] (1)
⟨s⟩ : [z] (2)
⟨a⟩ : [ɛ] (6)
⟨d⟩ : [t] (1)
⟨w⟩ : [v] (2)
⟨ch⟩ : [ʧ] (1)
⟨u⟩ : [ʌ] (1)
⟨r⟩ : [r/R] (4)
⟨ai⟩ : [e] (2)
⟨th⟩ : [θ] (1)
⟨ti(o)⟩ : [ʃ] (1)
⟨ea⟩ : [i] (1)
⟨d⟩ : [d] (1)
⟨a⟩ : [a/ɛ] (1)
⟨u⟩ : [ʊ/ə] (1)
⟨s⟩ : [s/ʃ] (1)
⟨a⟩ : [o/ɔ] (1)
⟨lk⟩ : [k] (1)
⟨a⟩ : [ɪ] (1)
⟨g⟩ : [ʤ] (1)
⟨j⟩ : [ʤ] (1)
⟨b⟩ : [p] (2)
⟨ph⟩ : [f] (1)
⟨o⟩ : [o] (1)
⟨e⟩ : [Ø] (3)
⟨w⟩ : [v/w] (1)
⟨e⟩ : [ɛ] (1)
⟨b⟩ : [p/b] (1)
⟨ai⟩ : [ai] (1)
⟨i⟩ : [ai] (1)
⟨v⟩ : [f] (1)
⟨g⟩ : [k[(1)
⟨e⟩ : [i] (1)
⟨V / r⟩ : [V / ɐ̯] (3)

Latinisms/Grecisms

⟨th⟩ : [t] (1)
⟨e⟩ : [e] (8)
⟨a⟩ : [a] (7)
⟨t⟩ : [t] (3)
⟨er⟩ : [ɐ] (3)
⟨s⟩ : [z] (6)
⟨y⟩ : [Y] (1)
⟨s⟩ : [s] (5)
⟨r⟩ : [r/R] (6)
⟨o⟩ : [o] (6)
⟨e⟩ : [ɛ] (7)
⟨i⟩ : [i] (3)
⟨i⟩ : [ɪ] (3)
⟨t(io)⟩ : [ʦ] (4)
⟨io⟩ : [i̯o] (7))
⟨g⟩ : [g] (1)
⟨u⟩ : [u] (4)
⟨u⟩ : [ʊ] (1)
⟨ch⟩ : [ç/k] (1)
⟨ua⟩ : [u̯a] (1)
⟨ss⟩ : [s] (2)
⟨c⟩ : [k] (1)
⟨au⟩ : [au] (1)
⟨s⟩ : [ʃ] (1)
⟨d⟩ : [d] (2)
⟨V / r⟩ : [V / ɐ̯] (5)

*Note on notation: Items in parentheses within the triangle brackets represent written units which exert environmental influence on the phoneme corresponding to its respective grapheme. The correspondence ⟨V / r⟩ : [V / ɐ̯] is the representation used for all sequences of a vowel followed by an “R”, where the “V” represents an unspecified vowel. Numbers in parenthesis represent the total occurrences of each correspondence in its respective loanword type grouping.