Abstract

The terms typology and psychotypology are undifferentiated in studies of cross-linguistic influence (CLI) in additional language acquisition. This paper explores typological effects in L3 vocabulary acquisition by hypothesizing that three forms of typology, historical language typology (E-typ), the individual learner's language typology (I-typ), and psychotypology (P-typ), are important in the study of second language acquisition (SLA). This hypothesis was tested using Spanish, English and German as focus languages. Etymological sources of vocabulary for these languages (E-typ) are given before testing the hypothesis on 41 Spanish L1, English L2, and German L3 Mexican university students. Students in the study were given English and German vocabulary tests to determine I-typ and a psychotypological survey to establish P-typ. Results were compared for E-typ, I-typ, and P-typ to verify if correlations exist. Results show correlations between E-typ, I-typ, and P-typ, but not absolute correlations since the languages involved are considerably similar at the lexical level and there exists some disparity between subjects' I-typ and P-typ. The findings indicate that further research is necessary to differentiate the subconscious processes involved in word processing from more conscious, strategy-related processes involved in psychotypologically based lexical decision-making.

1. Typology effects in L3 vocabulary development

This chapter serves to introduce the reader to research developments in the area of the mental lexicon, the acquisition of additional language vocabulary, and crosslinguistic influence. Additionally, it defines the problem associated with claims that psychotypology plays an active role in crosslinguistic influence and presents examples of this problem. It concludes with a synopsis and explanation of the purpose of the present study.

1.1 Overview

The understanding of the organization of the mental lexicon has been a topic of study for psycholinguists for quite some time (Altaribba & Mathis, 1997; Cenoz, Hufeisen, & Jessner, 2001; Hall, 2000; Jiang, 2000; Levelt, 1999). The mental lexicon can be viewed as the mental version of a dictionary and its processes can be quite complex (Hall, 2000). Word recognition, that is accessing the lexical item in the mental lexicon, is a rapid, complex process that is little understood. Further, accessing words involves convergence, i.e. accessing the correct word for the context. Errors in lexical access are demonstrated by slips of the tongue, blends, exchanges and substitutions (Levelt, 1989).

When two languages are involved, the matter becomes further complicated. Researchers have an interest in determining if the acquisition of second languages (L2) is similar to or different from the acquisition of a first language (L1) and how the words in the L2 are accessed and stored (Harley, 1995). Consequently, numerous studies in L2 acquisition have been conducted attempting to determine the architecture of the bilingual mental lexicon (for a survey see Murphy 2003; Harley, 1995). Many of these studies indicate that when speakers of second languages produce in the L2, the native language plays an active role in production.

Similarly, third language (L3) acquisition has been of recent interest to psycholinguists. As with L2 acquisition, various studies have been conducted to define the architecture of the multilingual lexicon (see Cenoz, Hufeisen, and Jessner, 2003 for a survey of research in this area). Although there are some similarities to L2 acquisition, one must account for the presence and interactions of all languages in the learner's repertoire during the acquisition and production of the L3. The presence of three language systems in an individual leads to the possibility of

interaction between all three systems during production of the target forms. This interaction, cross-linguistic influence (CLI), is of interest to researchers since it can provide clues as to how a multilingual stores and accesses the languages in his or her repertoire.

CLI, also known as *transfer* or *interference*, has been a point of discussion in L2 learning for several decades (cf. Weinreich, 1974; Eubank, et. al., 1997). Some proposed factors that may contribute to CLI include learner proficiency, age of the learner, activation levels of known languages, and linguistic typology. These factors and others are being explored not only in the acquisition of second languages, but also in the acquisition of three or more languages. The focus here is limited to L3 acquisition, however.

Cross-linguistic influence in L3 acquisition contains many of the characteristics found in CLI in L2 acquisition (see Murphy, 2003); however, the presence of additional languages can affect the degree to which these factors interact. One salient difference is that in L3 acquisition, both previously known languages may play active roles in the acquisition of words. Thus, for example, it is possible that CLI will occur from the L2 of learners rather than the L1 during the acquisition of the L3 because it is the most recent language acquired and therefore more highly activated than the L1, a phenomenon known as the *L2 recency effect* or the *last language effect* (Cenoz, 2001; Murphy, 2003; Ecke 2001; Hammarberg, 2001).

Another consideration is typological distance. Typology is generally defined as the study of the shared linguistic features, or correlations, between languages (Comrie, 1981, 1988) and is often determined through identification of cross-linguistic patterns (Croft, 1990). These correlations can occur because of close language ties, as a result of languages borrowing from other languages, or may simply arise as a result of coincidence, although the latter is not very common and typology is not generally concerned with occurrences of coincidence.

Most studies of CLI, however, only consider the first factor mentioned, historical language ties, and do not consider the factors of borrowing and coincidence. These studies have suggested that the more typologically close languages are, the more likely they are to transfer in production (cf. Cenoz, 2001; Ringbom 2001). Hence, if the L1 is more typologically close to the L3 than the L2 (or vice versa) than transfer is more likely to occur from the typologically close language.

The idea of typological effects in language acquisition at the lexical level (i.e., at the level of morphological expression) was initially developed by Kellerman. In his 1983 study, Kellerman proposed that learners' knowledge of language proximity, conscious or not, has an effect on the acquisition of additional languages. He termed this phenomenon *psychotypology*. The area of psychotypology has since been investigated by researchers for its possible role in CLI (cf. Cenoz 2001, 2003; De Angelis & Selinker, 2001). However, the central problem in this area of research is that the relationship between linguistic typology and psychotypology has yet to be clearly delineated. Consequently, the need for further exploration into the ideas of typology and psychotypology and the role they play in the development of the L2 or L3 is evident.

Two important questions regarding the roles of typology and psychotypology are the following:

1) How are typology and psychotypology defined?
2) What is the role of typology and psychotypology in relation to the acquisition and production of additional languages?

The focus here, then, is to explore the roles of typology and psychotypology as they relate to cross-linguistic influence during L3 vocabulary development. This issue is addressed through a

study conducted on native Spanish speakers with advanced levels of English knowledge who were learning German as an L3. The following paper outlines this study and its findings in detail.

The discussion begins with an account of current research in the areas of the mental lexicon, in particular the L2 and L3 mental lexicons. Additionally, the topic of cross-linguistic influence in L2 and L3 acquisition and production is explored. Following the discussion of CLI is an overview of typology, including a survey of the research into typological and psychotypological effects in L3 acquisition. Particular attention is paid to methodology used in previous studies on typology, and definitions of both typology and psychotypology are presented as well as the researcher's assumptions concerning their roles in the area of CLI. The discussion will proceed with an outline of the study conducted and end with a discussion of the results and their implications.

1.2 Research on the Mental Lexicon

1.2.1 Native Language Acquisition

Before models of the multilingual lexicon can be approached, it is first necessary to understand the processing and accessing mechanisms of the L1 mental lexicon. Levelt (1989) offers a model of L1 lexical access and processing. He proposes that lexical entries contain two major components: the lemma (semantic-syntactic features) and the lexeme (phonological features). Moreover, Levelt argues that the lemma contains the conceptual representation associated with the word. In this model, the preverbal message activates a lexical item when it closely matches the conceptual representation of the lemma.

Hall & Schultz (1994) agree with the above outline but emphasize that the conceptual structure is not language specific. They describe the L1 mental lexicon as a massive connection

of triads consisting of two linguistic components and one non-linguistic component, which is the conceptual structure. The two linguistic components of this model, similar to the description given by Levelt above, consist of a form representation of the word (pronunciation/orthography) and a syntactic component that includes information such as syntactic category, subcategorical marking, theme, and idiosyncratic features.

Most notable about the L1 mental lexicon is the fact that every word has links, ranging from strong to weak, to other words that are related in form, meaning, or word class; thus, lexical networks are formed. Speakers of a language access all of these components during production and comprehension of language, and they do so with automaticity and great speed (Aitchison, 1994). It is this automaticity and speed that sets the native speaker of a language apart from the novice foreign language learner. Models of the multilingual lexicon strive to explain accessing and processing mechanisms in the learner and in the fluent bilingual or multilingual speaker (Cenoz et. al., 2001; Murphy, 2003) This is done in an attempt to explain the differences exhibited by native and non-native speakers and with the idea that an understanding of the underlying mechanisms of speech production and comprehension may facilitate language teaching and learning strategies.

1.2.2 Models of the Bilingual and Multilingual Lexicons

One of the earliest models of the bilingual lexicon was set forth by Weinreich. Weinreich (1953/1974) proposed that the bilingual mental lexicon comprises three possible organizations: *compound*, *coordinate*, and *subordinate* (see Figure 1). According to this model, coordinate bilinguals have a separate conceptual representation for words in the L1 and for words in the L2. Thus, as Weinreich notes, for a speaker of English and Russian, the word *kníga* would be linked to a particular concept, whereas the English translation equivalent, *book*, would be linked to a

separate conceptual form. In contrast, compound bilinguals have only one conceptual form for words and their translation equivalents. In this type of organization, to use the above example, the words *kníga* and *book* would be linked to the same conceptual form but would not be directly linked to one another.

Unlike the previous two, the third type of organization (subordinate) describes a situation where one language is clearly dominant over the other. This organization takes into account the proficiency level of the speaker since the level of language dominance minimizes as proficiency is achieved. Here the speaker accesses the conceptual representation of the L2 word through a direct link with the L1 translation equivalent. To access the meaning of *book*, then, the speaker would link the word directly to the L1 word *kníga* and then access the concept evoked by the L1 word.

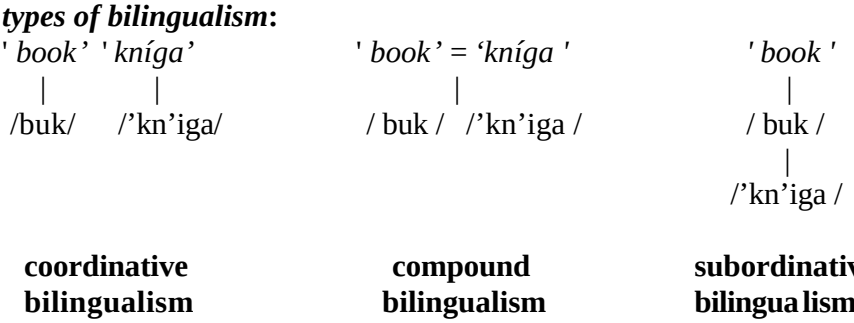


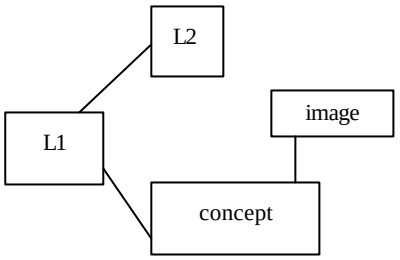
Figure 1. 1 : Weinreich's organizations of the mental lexicon

Since research has not shown evidence for coordinate bilingualism, but has shown evidence for the compound and subordinates models (Altarriba & Mathis, 1997), current researchers generally take into account only the latter two of the three mental organizations proposed by Weinreich (the compound and subordinate models,) when developing models of the bilingual lexicon. Most recently, attention has focused on the compound and subordinate systems

and their possible variations and combinations (de Groot, 1993). Many of these models are very similar to the systems proposed by Weinreich but are known by different names. The *word association model* (subordinate organization) and the *concept mediation model* (compound organization) presented by Potter, So, von Eckhardt, and Feldman (1984) are examples of this type of variation (see Figure 1.2).

Like Weinreich's subordinate model, Potter et al.'s (1984) *word association model* proposes that the learner accesses the concepts of L2 words through the translation equivalents in the L1. Conversely, the *concept mediation model* proposes that L2 words are directly linked to the conceptual structure just as L1 words are linked to the conceptual structure. After experimental studies to test the two models, Potter et al. (1984) found support for the concept mediation model, and the researchers concluded that this model more closely represents the bilingual mental lexicon. The main difference between Weinreich's models and the word association and concept mediation models is that, like Jackendoff (1983), Potter, et al. (1984) assume that conceptual representations are not language specific, but are abstract and belong to a separate system.

Word Association Model



Concept Mediation Model

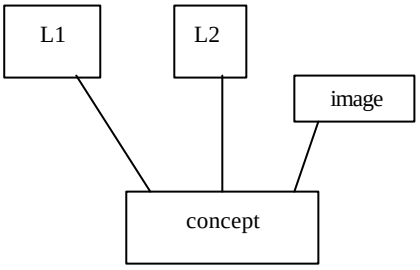


Figure 1. 2: The Word Association Model and the Concept Mediation Model (Potter, et al., 184)

Similarly, the *revised hierarchical model* adopts the ideas of word association and concept mediation but further asserts that there is a "developmental shift in second language learning from reliance on word-to-word connections to reliance on concepts" (Kroll & Stewart 1994, p. 151). This model presumes that the L1 will be substantially larger than the L2 for most bilinguals. Additionally, lexical connections from L2 to L1 are assumed to be stronger than those from the L1 to the L2. The researchers assume that this asymmetry is a result of the fact that L2 words are generally taught by directly associating them with L1 words, eg., explaining to Spanish-speaking learners of English *gato* means *cat,* as opposed to directly associating the L1 words to the newly presented L2 words, i.e. *cat* means *gato* (see Figure 1.3).

Furthermore, the model presupposes that translation from the L1 to the L2 is conceptually mediated while lexical translation from the L2 to the L1 is initially accomplished through direct mappings from the L2 word to the L1 word to attain access to the concept. Consequently, early learners of a language do not initially map L2 lexical entries to the conceptual structure. Eventually, as the learner achieves proficiency, a direct link from the L2 word to the conceptual system is established. Since meaning for the L2 word is initially accessed through the L1, the link from the conceptual system to the L2 will be weaker than the corresponding link in the L1until proficiency develops (Kroll, 1993).

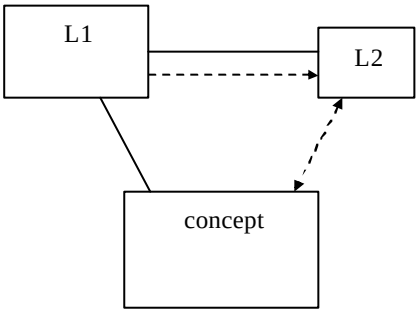


Figure 1. 3: Revised Hierarchical Model (Kroll & Stewart, 1994)

Altarriba and Mathis (1997) agree with Weinreich that combinations of these organizations may exist since experimental results indicate that beginning and advanced bilinguals access their two languages through different sets of mental links. Altarriba and Mathis also assert that the shift from word association to concept mediation occurs naturally as a function of language fluency. Additionally, they state that their experimental data do not fully support the Revised Hierarchical Model developed by Kroll and Stewart (1994). The authors

concede that the model is correct in its prediction that more fluent bilinguals rely on conceptual links when presented with words in the L2. Nonetheless, Altarriba and Mathis contend that it is not the proficiency level of learners that drive the links presented in the model. Rather, the authors argue that it is previous knowledge of the L2, for example the words that the learner already knows in the L2, which determines the shift from word association to conceptual representation.

Another model to consider is that presented by Jiang (2002). In contrast to the model proposed by Kroll and de Groot (1997), Jiang argues that rather than the L2 word being a separate entry that is linked to meaning through the L1, the L1 information is mapped directly onto the form of the L2. Jiang presents his ideas through an explanation of L1 lemma mediation based on Levelt's (1989) model of lexical representation. Levelt's model (1989, as cited in Jiang, 2000) assumes that each entry in the lexicon contains four types of information: meaning and syntax (the lemma), and morphology and form (the lexeme). Jiang extends this model to account for word acquisition in bilinguals.

According to Jiang, L2 words go through two stages of development. In the first stage, only formal specifications of the L2 word, such as the form, are contained in the entry and a link is developed to the translation in the L1. In other words, the L2 word is initially superimposed on the L1 lexical entry. As input increases, the L1 lexeme information is deactivated because it does not facilitate L2 word use. Thus, as the learner achieves proficiency, the L2 word moves from being mapped onto the L1 item to being directly linked to the meaning. Jiang contends that at this point the L1 lemma information is now copied directly onto the L2 lexical entry. As a result of this process, L2 word use is mediated by the L1 lemma information. Additionally, this mediation can both facilitate and interfere with lexical processing tasks.

Jiang concludes with a differentiation between those words learned through translation and those words that have no translation equivalent. He notes that without the benefit of lexical transfer, a word in the L2 must develop strong conceptual representation before it is acquired. Consequently, production of these items may take considerable time. As a result, once these words are acquired they may function more like L1 entries in ease and naturalness of use.

Hall (1993, 1996, 1997) and Hall and Schultz (1994) in their proposal of the Parasitic Model of lexical representation support the view that L2 words are initially accessed through the L1. The Parasitic Model describes words as being composed of three parts: the form, the frame, and the meaning (conceptual structure). Further, like Jackendoff (1983), Potter, et al. (1984), Kroll and Stewart (1994) and Altarriba and Mathis (1997), Hall and Schultz (1994) note that the conceptual structure is not a linguistic component and that it resides outside of the mental lexicon. This model assumes that the first stage of word learning is the establishment of the form of the L2 (i.e. the orthography and pronunciation). Once the form of the word is established, it is initially attached to the frame representation of the translation equivalent in the L1 and the learner applies the meaning and frame of the L1 to the L2. If no equivalent is found, then the learner must construct his or her own representation of the word in the L2, which will be directly linked to the conceptual structure. Eventually, through increased input, the learner revises connections and the configurations of the relevant representations so that, eventually, the semantic properties of the L2 are integrated.

In the event that the word encountered in the L2 is a cognate with a word in the L1, the Parasitic Model predicts that this word will have a direct connection to the cognate form in the L1 to ensure efficiency in processing. With true cognates, this connection will remain intact. However, with false cognates (those words that have the same form yet different meanings in the

two languages) the learner would need to reconfigure the connection once the error is discovered.

In a later study of L3 learners, Hall and Ecke (2003) extend the Parasitic Model to account for the architecture of the multilingual lexicon. The authors propose that when a learner encounters a word in the L3, the form activates the closest matches in the L1, L2, and L3 where available. The new word is then attached, parasitic style, to the most highly activated form. When differences are noted between the new word and its 'host' in one of the other languages, the representation is generally revised until the target form is reached (a continued lack of noticing results in fossilization). When the learner is unable to find a form match in the available languages, the new word is linked to the nearest translation equivalent. In the absence of translation equivalents, a provisional frame is developed and connected to the conceptual structure. Fluency develops as the connections between the new form and its host are revised, bypassed, or severed. Findings from this and other studies (Ecke, 2001; Hall & Ecke, 2003; Hall & Schultz, 1994; Hall, Ecke, Sperr & Hayes, 2004)) support the hypothesis set forth by the model that both the first and second languages contribute to cross-linguistical influence (CLI) in the acquisition of a L3.

According to Hall and Ecke (2003), CLI occurs as a result of the activa tion of form and/or meaning matches in the available languages. Consequently, the authors propose that understanding the architecture of the multilingual mental lexicon requires an understanding of the phenomenon of CLI. Additionally, although the authors agree that external factors (see below) contribute to the occurrence of CLI, they argue that these factors are exceedingly difficult to analyze because of their numerous interactions. Thus, they argue for further studies that concentrate on the internal factors since these factors are more easily controlled.

1.3 Factors Contributing to CLI

Due to the infancy of the area of study of cross-linguistic influence in L3 acquisition, much is still unknown about the interactions of the languages that a learner has at his/her disposal. Methodology and the scope of research are still being developed and there is a need to define terminology currently in use in this area (Cenoz, Hufeisen, & Jessner, 2001). Various factors have been offered to explain the occurrence of cross-linguistic influence in the production of additional languages.

Murphy (2003), for example, offers a comprehensive survey of proposed factors in CLI. Some items that may contribute to this phenomenon include lexical frequency, word class, the language context, educational background of learners, and the learner's linguistic awareness. Murphy concludes that the complex nature of L3 acquisition sets it apart from L2 acquisition and argues that many of the variables involved in CLI during L3 acquisition are currently underrepresented in the literature and are in need of further study.

An important consideration in the study of CLI is the idea of a learner's position on the language mode continuum proposed by Grosjean (2001). Grosjean defines *language mode* as "the state of activation of the bilingual's languages at a given point in time" (p. 2). Like Hall and Ecke in the previous section, Grosjean asserts that multilingual speakers' languages are all activated to varying degrees. This activation is contingent on the external factors surrounding production. An important factor to note is that the language mode continuum attempts to explain performance rather than competence in bilingual speakers. However, Grosjean posits that it is necessary to account for and control for the speaker's position on the language mode continuum

in studies of cross-linguistic influence. He contends that many studies confuse code switching, which is a production factor, with CLI, which is part of competence.

Like Grosjean, Cenoz (2001) believes the language mode of bilingual participants is a factor to consider in studies of cross-linguistic influence in L2 learners. Additionally, she proposes that linguistic typology and age contribute to this phenomenon and must be accounted for. Regarding CLI in L3 acquisition, Cenoz argues that one must not only account for the processes associated with L2 acquisition, but also for the more complex interactions between all of the languages a learner knows. In this respect she contends that L2 status is a factor that may contribute to the occurrence of CLI in production.

Hammarberg (2001) expands this idea that L2 status influences the production and acquisition of words in the L3. He contends that the level of L2 proficiency and the *recency* of the L2 (how recently the L2 has been used) affect the level of L2 influence on the L3. Thus, if the learner is highly proficient in the L2, it is more likely to influence the L3, just as if the L2 has been recently used it will be more highly activated. The final factor Hammarberg considers is the status of the L2, i.e. the fact that it is the most recently learned language. Research (see for example Gibson, Hufeisen, and Libben, 2001) indicates that there is a tendency to activate the most recently learned language during L3 performance.

Another factor that has been proposed to influence CLI is typology, and more specifically, psychotypology. Typology refers to the linguistic area of study that examines the 'correlations among different parts of a language's structure' (Comrie, 1988). Examples of typological factors to consider at the lexical level include word order, the incidence of cognates between languages; affixes attributable to a particular source language, such as the Latinate prefix *re-*; letter or sound combinations, e.g. the *sh/sch* common in Germanic forms; or the

presence of compounds such as those found commonly in English and German, e.g. hangnail, but infrequently in Spanish.

A more specific reference in the literature to typological effects in L2 and L3 acquisition is that which is termed *psychotypology*. Psychotypology was first proposed by Kellerman (1983) and refers to a language learner's "perception of language distance" (p. 114). Kellerman contends that transfer will occur more frequently when the learner perceives the target language as related to a previously known language rather than as unrelated.

Ringbom (2001) agrees with Kellerman's proposal that psychotypology plays a crucial role in additional language (L2, L3, L4, etc.) acquisition. He notes that in particular the effects of psychotypology can be seen in the acquisition and production of the lexis. As a basis for this argument he highlights the transfer of form seen with cognates and false cognates (words that have the same form in the two languages, but different meanings such as *red* in English, which refers to the color, and *red* in Spanish, which means *net* in English). He contends that the learners' transfer of form in the case of false cognates is a direct result of their psychotypological beliefs.

There are several problems with this account. First, a specific problem with the study by Ringbom is it does not consider the possibility that the transfer described can be attributed to L2 status. Rather, he claims that the tendency of learners to use the L2 as the basis for CLI in this and other studies is a result of psychotypology. Additionally, he does not consider the cognate effect. When a learner recognizes the form of a word, the frame and conceptual representation are automatically activated (cf. Hall, 2002; Hall & Ecke, 2003). In the case of false cognates, the correct form but incorrect conceptual representation is activated. Accordingly, transfer in the above example is better attributed to the typological facts of the languages (i.e., proximity at the

lexical level) than to the psychotypological beliefs of the learner. Finally, another more general criticism of studies that claim that psychotypology is a strong factor in the incidence of CLI in additional language acquisition is that psychotypology does not take into account if what the learner believes about a language is a result of what is represented in the individual's developing language system or what the learner knows about the historically typological facts about a language. Additionally, one must consider if psychotypology is a separate factor to be taken into consideration or if it is simply a state of what is referred to as I-language systems.

The idea of I-language and E-language systems was proposed by Chomsky (1986). Chomsky defines I-language systems as the internal language systems found within individual speakers. E-language systems are defined as external language systems and are a social construct. In reference to typology, one could view the individual's developing language system as part of the I-language system and linguistic typology as a subset of E-language.

The problem of non-differentiation between E-language and I-language systems is evident in several studies of CLI that conclude that language proximity and learners' perceptions have a strong influence on what items are transferred from each language (cf. Cenoz, 2001, 2003; Murphy, 2003; Hammarberg, 2001; De Angelis & Selinker, 2001; Ringbom 2001). In these studies it is not entirely clear that the roles of psychotypology (the learner's perception) and linguistic typology (at the level of E-languages) have been adequately differentiated since only those aspects of typology that result from historical ties are considered (Hall, 2004). This idea is explored in more detail in the following section.

1.4 The Present Study

As noted previously, there is a need to differentiate between psychotypology and typology in studies of cross-linguistic influence. Only by doing so can a correlation between

psychotypology and L3 vocabulary development be ascertained. To this end, for the purpose of this study three distinct forms of typology have been differentiated and are assumed to be of importance in studies of L2 and L3 acquisition (Hall, 2004, pp. 2-3). These forms of typology are based on the ideas presented in Chomsky's I-language and E-language systems and can be seen to represent a subset of these systems. Below are these forms as presented by Hall (2004) followed by a detailed explanation of each of these forms:

- E-typ: *The (study of) (proportion(s) of) shared linguistic features (indicators of language "type") in the groups of E-language systems[...]*
- I-typ: *The actual proportion(s) of shared linguistic features in the distinct I-language systems of individual multilingual learners/users[…]*
- P-typ: *The perception of the proportion(s) of shared linguistic features in the E-languages and/or distinct I-language systems in multilingual learners/users[…]* (p. 3)

Hall's category of E-typ is based on descriptive linguistics and refers to the historical facts about a language as well as language borrowing and coincidental similarities between languages. These are the external facts that we know about a language's typology. For example, we know from comparative historical linguistics that German, English, French, and Spanish all derive from the (Proto) Indo-European language family (Lehmann, 1992). Both English and German also belong to the (Proto) Germanic subgroup within this family and consequently share many similar features, particularly at the syntactic level. In this respect, German and English are typologically closer to each other than to Spanish or French.

However, it is crucial to bear in mind that despite the seemingly obvious proximity between E-language systems such as German and English, the matter is complicated at the

lexical level by extensive lexical borrowing. Evidence for this can be found in the English language, which has a large number of Latinate words adopted during the Norman Conquest beginning in 1066 (Lehmann, 1992). Thus, one might argue that English is in fact closer to French than to German because of the relexification of English by the French.

An example of one possible version of E-typ vocabulary profiles can be seen in figure 1.4. This figure shows a hypothetical distribution of vocabulary source categories, Other, Germanic, and Latinate, in the three languages in proportions, represented in percentages, as they occur in each language. In this profile, we hypothesize that Spanish is comprised mainly of Latin origin words with some words from other source languages. Because of the heavy borrowing found in the English lexicon, we hypothesize that English also consists of principally Latinate vocabulary. The next largest category of words in English would be Germanic, with other source languages providing a smaller number of vocabulary items. Finally, we hypothesize that German includes primarily Germanic vocabulary, with less Latinate vocabulary and an even smaller quantity of other source language vocabulary.

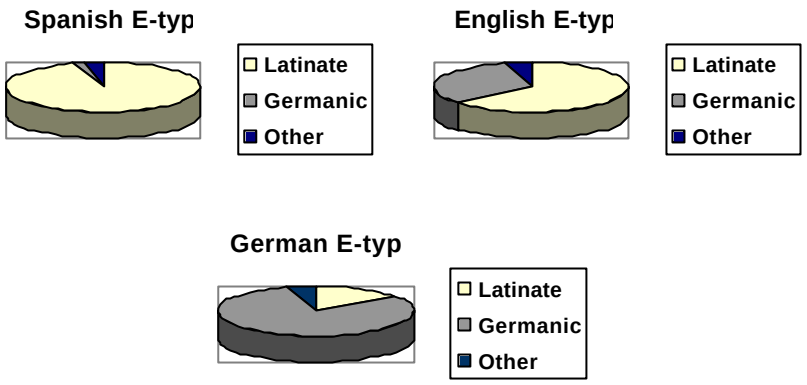


Figure 1. 4: Hypothesized E-Typ vocabulary profiles for Spanish, English, and German. Latinate and Other vocabulary are of lower frequency in the English and German profiles. Other vocabulary is of lower frequency in Spanish.

Next, Hall's I-typ category refers to what is actually represented in the minds of the individual L3 learners (Hall, 2004). These are the internal facts about language and are dependent on the proficiency of the learner. At the lexical level, for example, this would be reflected by the proportions of cognates (form and frame) present in the minds of the individual learners (Hall, 2004). These proportions may not coincide with proportions of cognates represented in E-typ since the mental lexicons of individuals are reduced in size. Further, the proportions may vary from individual to individual due to such factors as vocabulary size and stability at the time of measurement (see Hall & Ecke, 2003, for a more extensive listing of factors).

A hypothesized I-typ profile for a native Spanish speaker, fluent in English, who is learning German is presented in figure 1.5. This graph illustrates the assumed proportions, represented in percentages, of the learner's knowledge of words from each language source category. For Spanish, since the speaker is native, we assume that the majority of words known

will be of Latinate origin, just as with the E-typ profile. As the speaker is proficient in English, we expect that the (s)he will have a smaller English vocabulary than Spanish vocabulary. This variation in vocabulary size is not reflected in figure 1.5 since this graph shows only the percent proportions of source vocabulary in the mental lexicon of the learner, not the size of the lexicon. Moreover, since we hypothesize that the learner knows more higher frequency words in English, and those words tend to be of Germanic origin, we expect that the majority of English words known will be of Germanic origin, with fewer Latinate and Other words. Finally, since the speaker is a beginning learner of German, we hypothesize that the vocabulary size of the L3 is substantially smaller (again, this is not reflected in Figure 1.5) and is comprised primarily, if not completely, of Germanic vocabulary since we hypothesize that the higher frequency words in German will be of Germanic origin and higher frequency words are generally taught before lower frequency words.

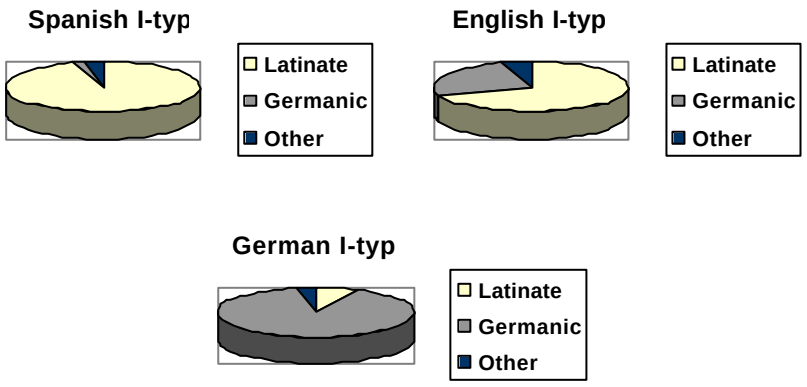


Figure 1. 5: Hypothesized I-typ profiles of a native Spanish speaker who is proficient in English and a beginning learner of German. These figures present only known vocabulary and do not account for the vocabulary present in the E-typ profiles that are unknown by the learner.

Finally, Hall's category of P-typ refers to the perception (psychotypology) that a learner has regarding the proximity of the languages (s)he is acquiring (Hall, 2004). This perception may be conscious or unconscious. Conscious perception would be if the learner were aware of the E-typ facts regarding language proximity. Unconscious perception would be part of the I-typ category and would be when the learner detects similarities during the acquisition process.

Considering these three forms of typology, one can see that researchers of L2 and L3 acquisition need to be very careful in asserting that psychotypology is a factor in cross-linguistic influence. Very often learners may consider only one aspect of language, such as syntactic structure, for example, when determining proximity. Thus, a Spanish speaker who is proficient in English and is learning German may believe that German is typologically closer to English than Spanish is to English (psychotypology) since German and English are historically related and have more similar syntactic structures. However, historical typology refers to all aspects of language structure such as word order, phonology, vocabulary, etc. and not just to syntactic structure. Therefore, it is possible that the learner actually knows more typologically close structures between English and Spanish than between English and German (this is what is actually represented in the learner's developing language system). An instance of this would be if the learner knows more Spanish/English cognates, which are an example of typology as a result of borrowing from French, than English/German cognates. In this respect, then, the learner's psychotypology does not correlate with what is actually represented in the developing language system.

A further example of the confusion between typology and psychotypology represented in the current literature is found in an explanation of CLI effects between Basque, English and Spanish offered by Cenoz (2003):

> Following De Bot (1992) and Paradis (1987) it could be hypothesized that the representation of the Basque linguistic system is more independent or distant from the representation of the Spanish and English linguistic systems, that is, Basque is represented relatively more separately because it is typologically distant and presents a different syntactic structure. Therefore our results indicate that when the languages involved are typologically distant and present important differences at the lexeme and lemma levels, the effect of typology would be stronger than the effect of L2 status. (p. 114)

The difficulty with this explanation is that it does not consider that what is represented in the linguistic system as a whole, and consequently all of the information on linguistic typology of the L3, is not present in the individual learner. Rather, what is represented within the individual is a developing language system. Thus the expectations of the learner (psychotypology) may not coincide with the typological facts of the language (s)he is acquiring.

According to Hall (1996), CLI effects are caused, at least in part, by the actual numbers of cognates within the mental lexicons of the learner, which again may or may not coincide with the expectations of the learners. Therefore, in the case outlined above, an alternative explanation could be that the subjects in the study knew more cognates between English and Spanish than between English and Basque. Consequently, although the above example is a case where the typological facts predict that transfer will occur more often between Spanish and English, it does not clearly demonstrate the role of psychotypology in the acquisition of an L3.

The main purpose of this study, therefore, was to develop profiles of E-typ, I-typ, and P-typ in an effort to determine if these three typologies are distinct. The profiles focused on Spanish as an L1, English as an L2, and German as an L3. Using this information, the correlation between L3 word development (represented by the learners' I-typ), typology (represented by E-typ), and psychotypology (represented by P-typ) were assessed to determine what effects, if any, psychotypology has on the development of L3 vocabulary. In the following chapter we discuss the methods used to collect the data for this study.