4   DISCUSSION

The discussion section focuses on the interpretation of the results with regard to the hypotheses posited. Reference is made to the Hall, Ecke, Sperr, & Hayes (2004) study in which results are compared and discussed, in the context of the Parasitic Model (Hall, 1993, 2002; Hall & Ecke, 2003; Hall & Schultz, 1994). Furthermore, a concurrent study (Hayes, in prep.), which provides additional findings in the area of psychotypology, is discussed. Implications, including those for language acquisition methodologies and future research, are then presented.

4.1   First hypothesis

This experiment investigated the possible connections between L1 or L2 cognate forms and frame acquisition in L3 vocabulary development. The first hypothesis postulated that a similar form representation (cognate form) of a new L3 word and a previously-known L1 or L2 translation equivalent will lead to the initial adoption of the corresponding L1 or L2 frame, when the learner has had recent exposure to these translation equivalents.

The results suggest that there does appear to be a cross-linguistic influence exerted on the selection of the L3 frame effected by the L1 or L2 cognate frame. The results from the first testing session show that 57.58% of the subjects chose the Spanish frame over the English frame in the Spanish cognate condition. Similarly, 55.88% of the subjects chose the English frame in the English cognate condition. There is a significant cognate effect present in the results. The first hypothesis of the experiment has therefore been supported. Evidence for the

Parasitic Model (Hall, 1993), in which learners will assume any two words to be translation equivalents if they share the same form, has been confirmed and expanded. The cognate status of L1 and L2 lexical items during L3 frame acquisition seems to exert cross-linguistic influence within the mental lexicon and gives insight into the organization of the mental lexicon.

The aforementioned question of whether form similarity affects frame use when translation equivalents are provided has been resolved. L1 and L2 lexical entry activation levels were artificially raised in the presentation session via translation equivalents. It was found that when activation levels were high enough in another language, form similarity led to frame inheritance in short term memory (see Figure 14 for an example). In this example, the L3 French verb *obstiner* is presented with its translation equivalents in L1 Spanish (*obstinarse*, which is reflexive) and L2 English (*persist*, which is not reflexive and takes a prepositional complement). These translation equivalents cause spreading activation to the L1 and L2, with the L1 activation being higher due to the cognate status. This form similarity leads to frame inheritance, which in this example is the reflexive.
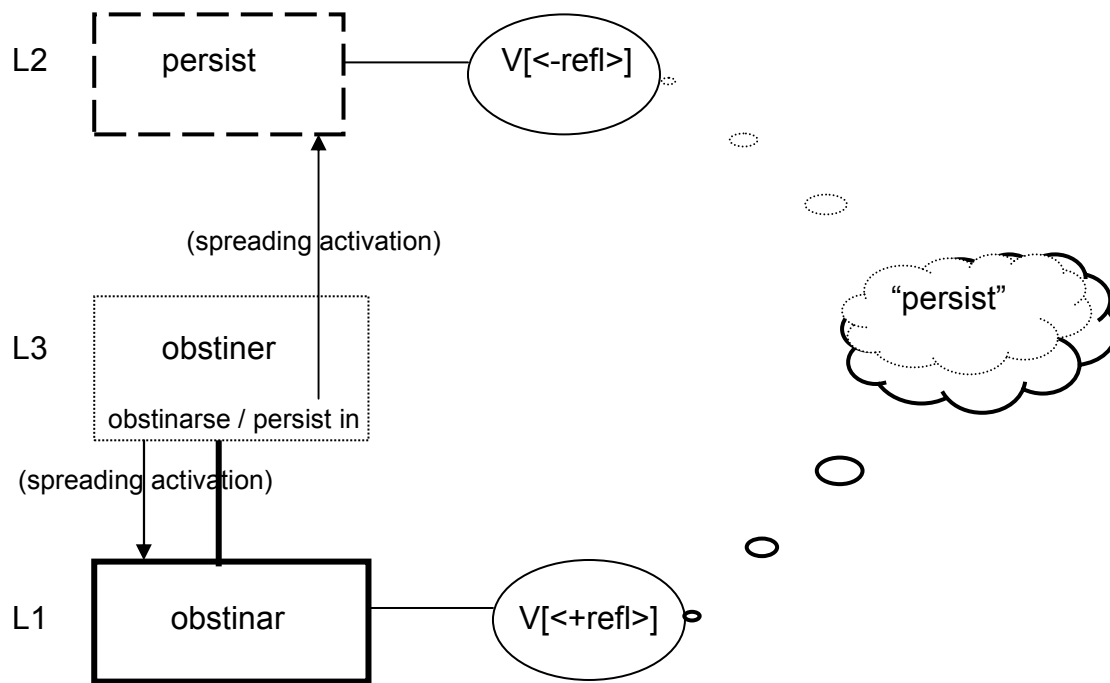
Figure 14: Example of frame inheritance in short-term memory

Interestingly, the results of the delayed second testing session showed an almost equal rate of Spanish frame selection in the Spanish cognate condition (57.50%), while the rate of English frame selection in the English cognate condition diminished (52.5%). The effect is still present a week later, not just immediately following the presentation phase. A major finding of the experiment is that, since there is still a significant difference (meaning there is still some effect), it is not the result of short-term priming only.

The Non-cognate condition in the first testing session showed a greater selection of the English frame (55%) as opposed to the Spanish frame (45%) when given no similarity in form to either English or Spanish. These results are very close to those of the English cognate condition. This suggests that a foreign

or L2 effect may have influenced the subjects. This is further discussed with regard to the psychotypological results in section 4.3. The results of the delayed second testing session showed an English frame selection of 52.78% (dropping 2.22% from the first testing session) and a Spanish frame selection of 47.22% (up 2.22%). A t-test was performed using the results from the Non-cognate conditions from the first testing session and the delayed second testing session. The results of the t-test showed that the change was not significant. These percentage results may indicate that any L2 effect in the Non-cognate condition is short-lived. With time, if subjects are not exposed to input reinforcing the cognate connection (as happened in this experiment, where there was no reinforcement), their selections seem to gravitate toward chance probability (guessing). This may be explained by an L1 effect in which the subjects relied more heavily than in the first test on their L1 Spanish when tested a week after the first testing session. The cognate effect may be only a short-lived phenomenon. Further explanation is merited (see section 4.2).

4.2   Comparison to L3 German

A comparison with the Hall, Ecke, Sperr, & Hayes (2004) study, which used German as the L3, provides an opportunity for insight into the cognate effect using a typologically different L3. The use of a typologically different L3 allows the separation of any L1 or L2 effect from a psychotypological effect. The results of the current study appear to be consistent with those of the German study. Hall, et al. (2004) found "a detectable cognate effect of CLI [Cross-Linguistic Influence] on

assumptions of grammatical frame" (p. 33) with similar results to all three cognate

conditions in the current French study, although there was a slightly greater

Spanish cross-linguistic cognate effect in the Spanish frame in the French study.

The Non-cognate condition in the German study had a much greater rate of

English frame selection in the first testing session (64.31%) and the delayed

second testing session (57.24%). Interestingly, the activation of translation

equivalents faded more quickly in the current French study than in the Hall, et al.

German study. This may perhaps be because of the subjects' psychotypological

views that German is typologically closer to English than it is to French. The

German study also demonstrated that the cognate effect appeared to be short-

lived, a pattern that the authors explained in relation to the Parasitic Hypothesis

(Hall & Ecke, 2003) involving interlingual connections. Because the connections

formed with the immature L3 lexicon and the L1 and L2 lexicons are tentative, the

exposure of the subjects to the presentation stimuli immediately before the first

testing session enabled the translation equivalents in all three languages to be

highly activated for the first testing session. The connections were weakened over

time, however, and the results from the delayed second testing session show that

some connections may have been lost. Further or continued reinforcement of the

connections would allow the connections to become permanent. As Hall, et al.

(2004) point out, "cognate status does not automatically result in across-the-board

parasitic dependencies" and "CLI is modulated by a host of factors which are

notoriously hard to pin down" (p.38). Some of these factors include age,

motivation, L2 status, amount of exposure, and many others (see Hall & Ecke,

2003 for a more complete listing).

4.3   Second hypothesis

        The second hypothesis of this thesis posited that psychotypology

(Kellerman, 1983) would exert a cross-linguistic influence on the choice of frame

by the subjects when the translation equivalents are *not* cognate forms. The Hall,

et al. (2004) study considered the high rate of English frame selection in the Non-

cognate condition to possibly be due to an L2 effect. The consideration of the

psychtypological (P-typ) views elicited from the subjects during the post-test

provided additional insight. Historically, German and English are more closely

related (E-typ). The subjects viewed German to be more similar to English

(81.8%) than to Spanish, and 53.1% of the subjects judged German and English to

be historically more closely related. The authors concluded that a

psychotypological effect was the reason for the higher rate of English frame choice

in the NoCog condition as compared to the EngCog condition. The subjects

seemed to depend on English, which was what they viewed as the typologically

closer language to German, more than on Spanish.

        The current experiment, as suggested by the German study, enabled the

potential confirmation of the psychotypological explanation by using French as the

L3 (see Figure 15). French and Spanish are Romance languages and thus are

historically closer, although the French invasion during the Norman conquest led

to the re-lexicalization of English due to substantial borrowing (Stockwell &
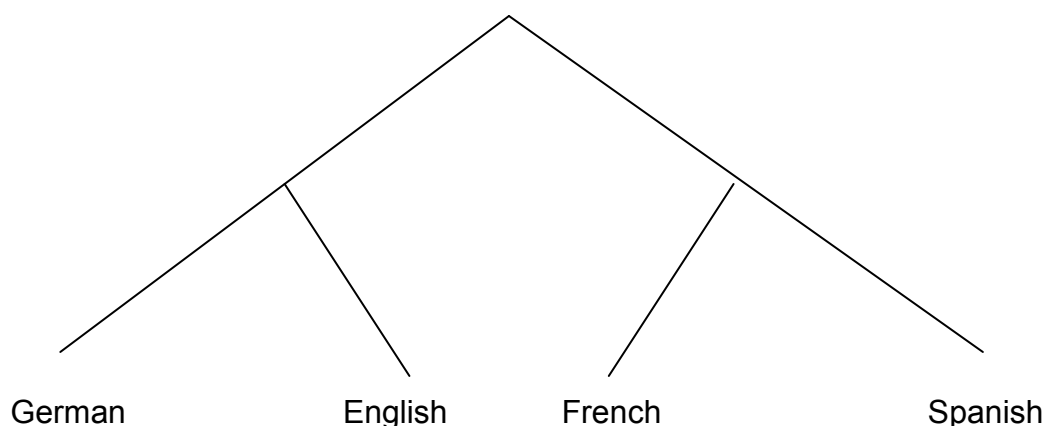
Minkova, 2001).

Figure 15: Historical relatedness of Spanish, English, French, and German

Psychotypological cross-linguistic influence would lead to the conclusion that if the

subjects believed that Spanish and French are more closely related, the subjects

would choose the Spanish frame more often when shown a novel French word

with no cognates present. Interestingly, this proved not to be the case.

The psychotypological views held by the subjects demonstrated a strong

belief that French and Spanish were the closest of the three languages. A large

majority, 94.9%, viewed Spanish to be the most similar to French and 89.7%

believed that French and Spanish were more similar than any other combination of

the three. When asked to choose a drawing representing the historically

genealogical relationship of the three languages, 59% chose the drawing with

French and Spanish more closely tied. Only 5.1% chose the drawing that showed

French and English more closely related. The results of this experiment, however, showed that subjects chose the English frame more often (55%) than the Spanish frame (45%) in the Non-cognate condition in the first testing session. This clearly suggests, therefore, that the effect influencing the subjects is not psychotypological, but rather may have been an L2 effect in which the subjects' second language influenced the acquisition of their third (i.e. if the new word is "foreign" and not recognized as a cognate, the learner may rely on their L2 to form a connection). It must be made clear that while it is possible to conclude that the effect seen was not a psychotypological effect, there may be other explanations besides that of an L2 effect, such as a recency effect, conscious or unconscious strategy use or guessing, or an as yet undiscovered effect (cf. Hayes, in prep.). More research is needed to find out what it may be.

The psychotypological views of the subjects thus far, however, are inconsistent with the results from the questions regarding ease of learning. Of the information gathered on the subjects' psychotypological views, two questions received unexpected responses. When asked which language would be easier for a native Spanish speaker to learn, 51.3% answered English and 48.7% answered French, even though the subjects believed overwhelmingly that French and Spanish are more similar. This may be due to the fact that the United States and Mexico are neighboring countries and English is more "internalized" through greater exposure through the media, music, and other sources. Surprisingly, though, when asked which language would be easier to learn for a native English

speaker, 61.5% of the subjects chose French and 38.5% chose Spanish. The concept of psychotypology, therefore, appears to not be as clear as it seemed.

4.4   Additional psychotypological data

Psychotypology, the perception or impression of the individual learner, may be based on cognates or historical and linguistic typology. If a new L3 has more cognates with a learner's L1 than with his/her L2, the learner may assume that the L1 is closer to the L3 than to the L2. Because of borrowing, cognates are logically independent of historical context and cognate status is logically separate from historical typology, although they are closely correlated. Cognates between languages may have been caused by history, but there is no history in the learner's mental lexicon. While languages may not be historically related, a large number of cognates between languages indicates proximity. The other basis of psychotypology may be learned historical typology, information gathered or absorbed by learners relating to the etymology or source of word, and its genetic connectedness, and linguistic typology, relating to word order or structural similarity. This structural similarity also refers to cognates, which are similar in form (Finegan, 1989; Odlin, 1989).

Hayes (in prep.) investigated the possible differences between typology and psychotypology. The subjects were native Spanish speakers (L1), who were advanced English speakers (L2), and were enrolled in a basic German course (L3) at a private Mexican university. The study distinguished three forms of typology and sought to reveal connections between these and L3 vocabulary acquisition.

The three forms of typology include E-typ (lexical typology of the whole language) and I-typ (typology of words that are in the minds of the learners, including second and third languages), which are both related to the lexicon. The third form, P-typ, relates to the perceptions that learners have about of the relationships the three languages have. With regard to E-typ and I-typ, Hayes found that the proportion of word sources (Germanic, Latinate, and other) in the lexicons was the same as the proportion of the words they knew. Surprisingly, the results suggested that the facts of the language (E-typ) and the actual words the learners know (I-typ) seem to show more Latinate characteristics (as opposed to Germanic) than were expected. Prior to conducting the study, Hayes theorized that the German language would contain more Germanic than Latinate word characteristics.

In a psychotypological survey similar to the one in the post-test of the current experiment, Hayes' results followed those of the Hall, et al. (2004) German study to an even higher degree, with subjects believing that German and English are much more similar (95.4%) and closely related (93.2%) than German and Spanish or Spanish and English. The learners thought that English and German were more closely related than Spanish, and believed that historically that was also true. From the results of the German vocabulary test given the subjects, only 17% of the words they knew were English/German cognates while 40% of the known words were cognates across all three languages. From the results of the English vocabulary test, 39% of the known words were Spanish/English cognates. Based on the corpus of words the subjects knew (and their word sources), they did not seem to have sufficient or overwhelming grounds for assuming that English

and German were much more closely connected than other possibilities. The study did not show any evidence that the psychotypological beliefs proffered by the subjects had derived from subjects' I-typ form of typology. The subjects' perception of the psychotypological relatedness of the three languages does not seem to correspond with the actual facts of the language. The subjects may have been consciously using psychotypology as a basis for their assumptions, but their perception was not based on what they knew. This corresponds with the results found in the current study.

4.5   Subject comments

It seems that in the current study, subjects did not use psychotypology and they also used few conscious strategies to help them make their choices. This supports the hypothesis, which conforms to the Parasitic model idea of unconscious connections. It should be noted that the subjects' post-test comments were regarding the 90 verbs and nouns. Some comments may have been made with both verbs and nouns in mind, or just one or the other. Subjects were asked, "Did you utilize any special strategy when *studying the words* during the original presentation last week? What were they?" and 30% responded with a definite "no". Of the special strategies used, 22.5% of the students responded that they tried to relate the French word (noun or verb) with the translation equivalents provided underneath. One subject actually said, "Yes, identifying (or trying to identify) the cognates". Another 17.5% related the French word only to Spanish, and 5% related it only to English. Only 7.5% of the subjects tried to consciously

memorize the words, but soon found a difficulty in memorizing 90 words. The rest of the subjects mentioned associating the word with something relating to it, such as an idea, thing, context, or situation.

Subjects were then asked, "Did you utilize any special strategy when *choosing the correct sentence* during the testing sessions? What were they?" 30% stated that they chose the one that "sounded the best" while 17.5% were guided by context or "what made the most sense". 12.5% said they utilized no conscious strategy. Other subjects mentioned using logic and trying to remember the words from the presentation phase of the experiment or from their class. One subject commented, "I based it on the relationship with the other languages".

Finally, when subjects were asked, "Do you have any other comments about the study or your participation?", their main observation was that the presentation and testing were long and tiring. Two of the most interesting comments were "That when comparing the words with English, they have a similarity which makes it easier to memorize" (showing a subject's focus on cognate form) and "I don't have a good short-term memory, so I need to review several times if I need to memorize (showing that the subject believes that repeated exposure does strengthen the interlingual connections).

It appears that the subjects in the study utilized a minimal amount of methods or strategies in the experiment. The subjects' post-test comments regarding conscious memorization strategies were similar to those in the Hall, et al. (2004) German study, where only 24.2% mentioned consciously memorizing or remembering the translation equivalents from their L1 or L2.

In sum, the study has shown that there was spreading activation from the novel L3 verb to the L1 or L2 cognate form to the corresponding L1 or L2 frame. Contrary to an anticipated psychotypological effect on L3 frame selection in the non-cognate condition, there appeared to be an L2 effect that influenced subjects' choices.

4.6   Pedagogical implications

Additional teaching methodologies and learning strategies involving the cognate effect to aid L3 learners in vocabulary acquisition may be developed to optimize language learning based on students' styles and strengths. An increased teacher awareness of the Parasitic Model of form-frame-concept representation may lead to decisions about how to present cognate and non-cognate vocabulary, as well as the potential benefits for strategies regarding frame acquisition. Second language teachers could consider teaching frame awareness to their students so students could visualize the form-frame-concept awareness as it relates to their own L1, L2, L3,...Ln. Although L3 verb frames in many cases may coincide with an L1 or L2 cognate form, students (especially adults, who tend to directly substitute a new word for the old, such as saying in their Spanish target language *Gusto bailar* for *I like to dance*, using *gustar* the way *like* is in English) could be encouraged to develop a metalinguistic awareness, such as that the frame of a new L3 word does not always follow its L1 or L2 cognate. This can be complicated, however, as many words have multiple frames, depending on their uses in context.

Instead of battling against an automatic process of how the mind works, perhaps teachers could become unafraid to use students' L1 or L2 in beginning L3 classrooms and realize the benefits of doing so. Translation may be a preferred learning strategy and may prove useful. A learner's L1 (or L2, etc.) should not be banished from the classroom. Cognate recognition could help students connect their L1 or L2 with a new L3 word. For example, L1 Spanish students could put an *-e* on every L3 English word that starts with *st-* in order to connect it with a cognate (such as *student – estudiante*). Students could receive explanation of a subordinate representation linking the L3 word to their L1 or L2 word which then would connect to the concept, perhaps both explaining that this occurs and helping them to create these links.

4.7   Limitations of the study

As noted by the subjects, the presentation and testing phases did seem long to the subjects, although the entire experiment was completed in two 50-minute class periods. Some subjects seemed bored and were not always paying their full attention, and this could have affected the results. Perhaps the number of stimuli could be reduced in the first task, but the risk of losing too many stimuli due to French and English prior knowledge is great. There was also an unnaturalness in the presentation of the novel French verbs with their translation equivalents. Stimulating the activation of lexical entries naturally instead of artificially would have been preferable, perhaps by choosing specific contexts in which these words

70

would arise. Another possible change is that the order of the sentences within each slide (A/B) in the delayed second testing session could have been altered in the interest of a more complete randomization.

A potential critique for the study could be that the study may have examined only priming and not any other aspect of the organization of the mental lexicon. While the presentation of the translation equivalents of a novel L3 French verb may have primed L1 English and L2 Spanish, the connections forged by an L1 or L2 cognate to a previously unknown L3 verb are new. The L3 verb is being tentatively mapped in to the mental lexicon and the organization of it is being adapted. Furthermore, this experiment demonstrated that, since the effect was still present during the delayed second testing phase, it was not just the result of priming.

4.8   Further study

While this study has added to the area of cross-linguistic influence in the multilingual lexicon with regard to vocabulary development, it is obvious that much more research could be done. The results from the current study, as well as from Hall, et al. (2004) and Hayes (in prep.), clearly show the multiplicity of interrelated elements of cross-linguistic influence in the multilingual lexicon. Further study is needed to achieve a deeper understanding of this area and provide added insight to the architecture of the multilingual lexicon.

An interesting replication study would be one that uses English as an L1, Spanish, French or German as an L2, and a typologically different language from

the L1 or L2 (such as a Slavic language) as an L3, although there is an abundance of research using English as the L1. Also, in a similar study, individual student responses across the immediate and delayed testing sessions could be monitored to explore how his/her responses altered over time.

If the number of stimuli could be kept reasonably low, the addition of a fourth verb condition would prove interesting. A fourth condition in which all three languages contained a cognate verb form would provide additional data into the possible L2 or psychotypological effects that L1 and L2 translation equivalents have on the L3 frame selection. It would prove quite intriguing to compare these results with those of the non-cognate condition utilizing a variety of typologically different languages. Perhaps there would be a greater L1 influence on the L3 since all the verbs would be cognates and the highest activation would be the L1 translation equivalents. This fourth verb condition was not included in this experiment due to the extended duration of presentation and testing phases that this would have incurred.

The concept of psychotypology appears to be assumed as a standard form of cross-linguistic influence. Studies like this one, however, seem to be weakening the unanalyzed version of psychotypology. Additional studies attempting to isolate the possible effects of psychotypology may unravel the complexity of this concept and lead to discoveries of new cross-linguistic influences or further evidence for existing ones.