

Cognitive Motivation for a Derivation/Inflection Division:  
Evidence from Native English and Spanish Speakers

Mike Olsen  
LING 2773  
December 14, 2009

# 1. Introduction

All human languages employ words to convey concepts. In some languages (e.g., Chinese languages), most words are simple, conveying only one semantic feature, while in other languages words are complex, conveying many different semantic features (e.g., Greenlandic). Words that deconstruct into discrete units, called morphemes, consist of a root, which conveys the most prominent semantic feature of the word, and affixes that attach in some way to the root (i.e., prefixes, suffixes, and infixes<sup>1</sup>) that convey additional semantic features. Morphologists have traditionally divided the affixation processes that form complex words into two main categories –inflection and derivation.

Although inflection and derivation describe different morphological processes, morphologists do not universally accept the reality of this division (see Gonnerman, Seidenberg, & Andersen, 2007; Feldman, Soltano, Pastizzo, & Francis, 2004 for alternative approaches) nor do they agree on how this division should be made (Stump, 2001). Because there has been considerable debate on this division, “there is a need for a principled way of determining whether a given process is inflectional or derivational” (Katamba & Stonham, 2006, p. 224). The purpose of this paper is to provide preliminary

---

<sup>1</sup> Prosodic morphology (see McCarthy & Prince, 1988), in effect, handles infixes as prefixes and suffixes by attaching bound morphemes to prosodic words.

evidence of a psychologically real division between derivational processes and inflectional processes. Section 2 is a review of the relevant literature regarding the division of derivation and inflection from theoretical perspectives and literature that has attempted to describe morphological decompositional processes through psychological experiments. Section 3 is a presentation of a pilot experiment that suggests the reality of a psychological division between derivation and inflection. Section 4 is a discussion of what the results of the experiment have to contribute to the dialogue on derivation and inflection. Finally, section 5 is a discussion of my conclusions.

## **2. Literature Review**

### **2.1. Theoretical Perspectives**

The traditional assumption made by morphologists regarding derivation and inflection is that derivation describes those morphological processes that involve word-formation, while inflection describes morphological processes that relate to syntactic processes (Beard, 2001; Stump, 2001; Katamba & Stonham, 2006). Perlmutter's (1988) Split Morphology Hypothesis exemplifies the idea that there is a lexical-syntactic division of morphological processes. According to the Split Morphology Hypothesis, derivational processes take place in the lexicon before sending semi-formulated units (i.e., units devoid of inflectional morphemes) to the syntax while inflectional processes take place post-syntactically. In other words, the syntactic processes divide derivational processes from inflectional processes.

Beard (2001) bases a general presentation of derivation on three diagnostics that emerge from Lexicalism (Chomsky, 1970) for distinguishing derivational from inflectional processes. These diagnostics are formulated in the statements listed in (1).

- (1)
  - (a) Inflection is syntactically driven and derivation is lexically driven.
  - (b) Derivational processes occur before inflectional processes, so derivational markings are inside inflectional markings.
  - (c) Inflection is fully productive while the productivity of derivation is limited.

(pp. 44-46)

Stump (2001) provides a more specified version of these diagnostics in a series of criteria that he states morphologists generally use to differentiate derivation and inflection. A list of Stump's criteria is provided in terms of inflection in (2).

- (2)
  - (a) Inflection does not change lexical meaning or part of speech.
  - (b) Inflection is syntactically determined.
  - (c) Inflection is generally more productive than derivation.
  - (d) Inflection is semantically more regular than derivation.
  - (e) Inflection closes words to further derivation while derivation does not.

(pp. 15-18)

These diagnostics however are not free from irksome data that provide evidence to the contrary. Beard (2001) himself provides a counter example to (1a) and (2b) in Russian grammatical case functions (syntactic in nature) that lexicalize. He shows that instrumental case never marks punctual time except in temporal nouns. Beard's examples are "*utr-om* 'in the morning', *dn-em* 'in the afternoon', *večer-om* 'in the evening', and *noč'-ju* 'at night'" (pg. 45). Although punctuality is a case function, it has become lexicalized in these situations.

An example that is problematic for (1b) and (2e) is the order of diminutives and plurals in Breton. Stump (1991, 1993, 2001) shows that plurals (inflectional) in Breton can be realized closer to the root than diminutives (derivational) as in the Breton word for ‘little boats’ *-bag-où-ig-où*. Here, one of the pluralizing suffixes *-où*, which can occur twice in the same word in Breton, occurs further away from the stem than the diminutive suffix *-ig*. This shows that at least one inflectional process (according to Stump) is occurring before a derivational process.

One counter example to (1c) and (2c) is that the derivational morpheme *-ing*, which creates abstract nouns from verbs (e.g., *exercis-ing* as in ‘exercising is healthy’), is extremely productive. Criterion (2d) also has counterexamples. In Spanish, the inflectional suffix *-amos* attaches to 1<sup>st</sup> conjugation class verb stems and encodes 1<sup>st</sup> person plural, present indicative (e.g., *camin-amos* ‘we walk’). The problem is that *-amos* can also encode past preterit meaning (e.g., *camin-amos* ‘we walked’), rendering this suffix semantically ambiguous.

Criterion (2a) seems to be the most robust in distinguishing derivation from inflection; however, the lack of changing a lexical meaning or part of speech is not strictly a property of inflection. Stump (2001) gives the example of synonymous pairs (e.g., *cyclic/cyclic-al*) where the derivational affix does not change lexical meaning. Stump also provides an example that shows that not all derivational processes change the speech category of the stem in the derivational prefix *re-* (e.g., *re-read*).

Although these diagnostics do create a general division between derivation and inflection, the language data that refute each one has not been totally overlooked. Researchers have attempted to account for these data by further dividing derivation or

inflection. Booij (1993, 1995) rejects the Split Morphology Hypothesis and posits that all morphological processes must occur in the lexicon. He uses data from Dutch that shows, as do some of the counter examples to the aforementioned criteria, that some inflectional processes must feed derivational processes. To account for this, Booij conjectures a division in traditionally inflectional processes –inherent inflection and contextual inflection. Contextual inflections are the morphological processes that the syntax requires. These processes cannot feed derivational processes because their features must be accessible to syntactic processes. Inherent inflections are processes that are not required by the syntax, although they are still relevant to the syntax. According to Booij, Dutch pluralization is an example of inherent inflection. When the plural suffix *-en* is attached to non-count nouns (e.g., *bier-en* ‘types of beer’), it “involves concomitant semantic change” (Booij, 1995, pg. 3). Because inherent inflection is like derivation and is not essential to the syntax, it can feed derivational processes and can undergo lexicalization (e.g., infinitive verb forms in Spanish becoming nouns V: *caminar* ‘to walk’ →N: *el caminar* ‘walking’).

Other researchers have suggested different types of division. Scalise (1986) posits a third morphological process that lies between derivation and inflection in an approach called Evaluative Morphology. In Evaluative Morphology, derivational rules occur first, the output then proceeds to an evaluative process that adds specific affixes and then on to the inflectional rules. Evaluative affixes are those that maintain some of the semantic features of the base while changing others. Breton diminutives are an example of

evaluative affixes (e.g. *potr* (masc.) →dim. *potrig* (masc.); *merc'h* 'girl' (fem.) →dim. *merc'hig* (fem.)<sup>2</sup>). Although this seems to account for the similarity between some inflectional affixes and derivational affixes, there is not a sufficient amount of evidence for positing a third processing category (see Stump, 1993 for criticisms)

Rejecting Evaluative Morphology, Stump (1991, 1993) accounts for the fact that some affixes seem to preserve semantic features of the base by keeping inflectional rules separate and dividing derivational rules into two categories –category-changing rules of derivation and compounding, and category-preserving rules of derivation and compounding. An example of a category-changing derivation in English is the addition of the suffix *-ing* to verbs that creates abstract nouns (e.g., *practic-ing* as in 'practicing forms habits'). An example of a category-preserving derivational rule in English is the addition of the prefix *re-* that conveys repetition (e.g., *re-write* as in 'please rewrite this page'). These rules, which Stump labels morpholexical rules, account for the problems with (1b) and (2e) above; however, they do not solve the issue of a discrete categorization of derivation and inflection. The counterexamples to the other criteria listed in (1) and (2) have yet to be resolved.

The problematic nature of a strict derivation/inflection division supported (or not supported) by empirical data gives rise to the question of whether the assertion of these theoretically separate morphological processes should be a part of morphological theory at

---

<sup>2</sup> Example taken from Stump (1993)

all. As attested by Stump (2001) some morphologists have claimed that such a division cannot be established on empirical grounds and therefore, a concise morphological theory should not embrace it as a fundamental. Such a position, however, throws the baby out with the bathwater. With regard to the data supporting a division of derivation and inflection, Stump (2001) mentions that the “unexceptional phenomena [...] are vastly more numerous” (pg. 19) than the linguistic phenomena that riddles a strict division.

Therefore, because most evidence points towards a division between derivation and inflection, the search for a means for supporting such a division is still a worthy cause for investigation. Because linguistic production data (i.e., data not collected through psychological tests) has not yet provided sufficient evidence of a division, perhaps a view of cognitive processing of morphology can make an essential contribution to the debate. The main goal of this paper is to provide preliminary psychological evidence for dividing derivation from inflection. Before discussing the current experiment, however, I will provide a brief review of current research that has investigated the psychological reality of internal word structure (i.e., morphological processing).

## **2.2. Psychological Experiments**

Whether or not the internal structure of words is psychologically real or used in word recognition and production processes has been the main topic of recent research that involves derivational and inflectional processes (see Badecker & Caramazza, 1989; Feldman, Soltano, Pastizzo, & Francis, 2004; Gonnerman, Seidenberg, & Andersen, 2007; Katz, Rexer, & Lukatela, 1991; Marlsen-Wilson, Bozic, & Randall, 2008; Sanchez-Casas,

Igoa, & Garcia-Albea, 2003). I present a review of this research from a perspective of what it can say about the derivation/inflection distinction.

Gonnerman, Seidenberg, and Andersen (2007) studied word-recognition from a connectionist perspective and provide evidence that supports a distributed approach to morphological processes. They found priming effects for phonological and semantic relations between words. In other words, the more closely related two words were semantically (e.g., *idea-notion* as opposed to *spin-spinach*) or phonologically (e.g. [əkseptəbəl] ‘*acceptable*’-[əksept] ‘*accept*’ as opposed to [ɪntɹədʌktʃən] ‘*introduction*’-[ɪntɹədʌs] ‘*introduce*’), the higher priming effects were evident suggesting that these factors are more important in word-recognition than morphological composition. That whole words<sup>3</sup> were primed based on phonological and semantic similarities supports the idea that derived and inflected word-forms exist along a gradient of regularity. This approach to morphological processes eliminates the need for a distinction between derivation and inflection because it denies the existence of morphemes. All form-meaning relations are based on phonological and semantic associations. Feldman, Soltano, Pastizzo, and Francis (2004) also found similar results in their study that only considered semantic transparency. They observed stronger priming effects for words that were more

---

<sup>3</sup> This study supports the ideas that word recognition is non-decompositional

semantically related (e.g., *sweat-sweaty*) than words that were less semantically related (e.g., *sweat-sweater*).

Other studies have obtained evidence for a separation of derivational and inflectional processes. A study by Katz, Rexer, and Lukatela (1991) found that although participants' reaction times were smallest when presented stem and affix simultaneously (alluding to a non-decompositional explanation for word-recognition), they still treated derived forms differently from inflected forms later in the recognition process. Katz, Rexer, and Lukatela posit that, at first, we do not perform a decompositional analysis in word-recognition. Later in the recognition process, however (after the stem and all associated word-forms are activated), morphological analysis does take place and at this point the difference between inflection and derivation is evident.

Providing evidence that contradicts the findings of Katz, Rexer, and Lukatela (1991), Marlsen-Wilson, Bozic, and Randall (2008) suggest that morphological analysis does play an earlier role in word recognition. Through masked priming experiments where native English speakers were presented varying prime exposure durations of morphologically, semantically, and orthographically related word pairs, they showed that morphological decomposability was the strongest prime among the other candidates. All reported reaction times were faster than reaction times reported in Katz, Rexer, and Lukatela, suggesting an earlier decompositional process.

Sánchez-Casas, Igoa, and García-Albea (2003) also argue that word recognition is decompositional. They provide a set of four priming experiments using native Spanish speakers that show that morphological information is stored in the lexicon and is used in word-recognition. They also discuss the possibility of a psychologically real distinction

between derivation and inflection. However, they do not claim that the data they obtained is strong evidence for or against a distinction between derivational and inflectional processes.

Perhaps an aphasic patient studied by Badecker and Caramazza (1989) provides the most decisive evidence of a psychologically real division between derivational and inflectional processes. They argue that derivation and inflection are separate in the lexicon because the patient made inflectional mistakes in multi-word utterances and in single-word repetition tasks. In addition, the total number of derivational mistakes was considerably lower than the inflectional mistakes. This study, however, does not provide conclusive evidence to know whether a separation between derivation and inflection must be coded in the lexicon or in separate linguistic entities. However, Badecker and Caramazza do provide some evidence of a psychologically real division between morphological processes.

Because the small amount of psycholinguistic research that has informed a division between derivation and inflection has not focused on such a division, a gap exists in the knowledge base concerning derivation and inflection. In addition, because the corpus/production-based data is contradictory concerning a strict division between derivation and inflection, a psycholinguistic experiment that specifically examines the prospects of this division can provide evidence that is more concrete. Here, I must make the assumption that, as most of the psycholinguistic research on word-recognition supports, words are psychologically decompositional. This assumption then allows me to pose the questions that this pilot study begins to answer:

(3)

(a) Is there a psychologically real division between derivation and inflection?

(b) Do Spanish speakers treat derivation and inflection the same way as English speakers?

### **3. Experiment**

Because, to my knowledge, research focusing on obtaining psychological data that supports or discounts the distinction between derivation and inflection does not exist, it is important that a pilot study be carried out to see whether or not reliable psycholinguistic results are tenable in this area of study. Another important reason for this pilot study is to fine tune methodological issues that may arise.

#### **3.1. Participants and procedures**

Six native English-speaking and six native Spanish-speaking adults participated in this study. The native Spanish speakers were all graduate students studying at the University of Pittsburgh from a variety of countries and dialects. The native English speakers were all originally from Utah and thus spoke the same Western English dialect.

Isolated homophonous morphemes (distinct morphemes that share the same phonological form) where one realization is usually considered derivational and the other is usually considered inflectional were presented to all participants to see whether the first response that entered their minds could be considered either a derivational or an inflectional definition. The investigator told participants that they would be listening to suffixes (or a prefix in the case of the Spanish *re-*) and that they should write down the first

definition or function of the suffixes that entered into their minds. When participants indicated that they were ready, the affixes were then pronounced aloud in the same order that they are listed in Table 1. All participants were presented all of the affixes corresponding to their native language (five affixes). The English and Spanish affixes used are listed in Table 1 along with their definitions. Both definitions of English suffixes were attested in Katamba and Stonham (2006) and Spanish affixes were attested in Lang (1990).

The pronunciation of *-est/ist* is key to the claim that these affixes form one homophonous morpheme in speech production. Speakers of the particular variety of Western English spoken by all English-speaking participants pronounce both *-est* and *-ist* as [əst].

Definitions were counted either derivational or inflectional if the definition clearly aligned with the definitions in Table 1. An example of an English definition of inflection was “makes it more than” as a response to *-er*. An example of an English definition counted as derivation was “one who specializes in X”. As for Spanish examples, one inflectional definition was “terminación del infinitivo” *infinitive ending* for *-ar* and one derivational definition was “adjetivo” *adjective* for *-do*.

Statistical analyses were performed to see whether participants’ first reactions to the stimuli were to assign an inflectional meaning or a derivational meaning. The groups were also compared to see whether English speakers behaved differently than Spanish speakers.

**Table 1:** List of homophonous morphemes

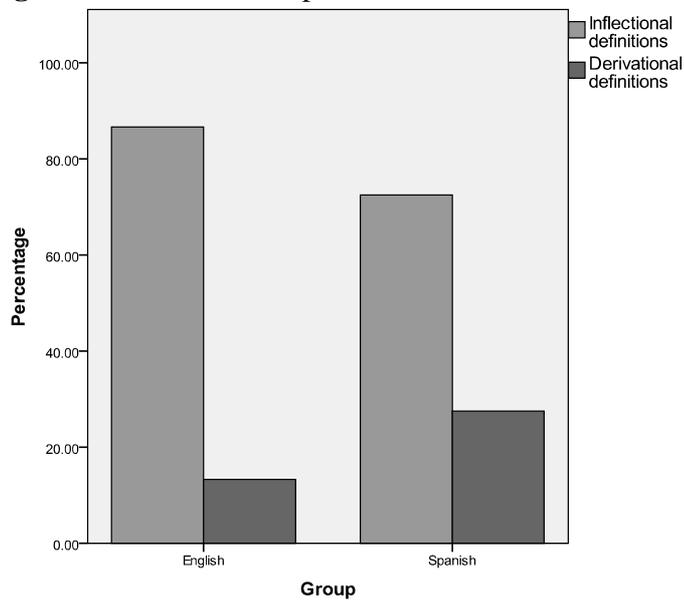
	Affixes	Derivational function/example	Inflectional function/example
<u>English</u>			
	-ing	Creates abstract nouns/ <i>Eat-ing</i> is fun.	progressive aspect marker/ He is <i>eat-ing</i> .
	-er	Agentive marker/ The <i>wait-er</i> works here.	Comparative marker/ I am <i>happi-er</i> than before.
	-est/ist [əst]	Agentive marker/ Mary is a <i>gymn-ist</i> .	Superlative marker/ That tree is the <i>big-est</i> on the block.
	-en	Creates stative adjectives/ The <i>brok-en</i> car is on the street.	Past-participle marker/ The cars have <i>brok-en</i> .
	-ed	Creates stative adjectives/ I am <i>interest-ed</i> in morphology.	Past-tense marker/ She <i>jump-ed</i> a second ago.
<u>Spanish</u>			
	re-	'Repeat X'/ Tengo que <i>re-escribir</i> la oración.	Intensifier/ Lo pasé <i>re-bien</i> anoche.
	-do	Creates stative adjectives/ El carro <i>quebra-do</i> está en la calle.	Past-participle marker/ El carro esta <i>quebra-do</i> .
	-o	No predictable meaning <sup>4</sup> /El <i>frut-o</i> del servicio es felicidad.	1 <sup>st</sup> person present indicative or masculine/ Yo <i>habl-o</i> español.
	-a	No predictable meaning/ yo comi una <i>frut-a</i> y una verdura.	3 <sup>rd</sup> person present indicative or feminine/ Ella <i>habl-a</i> español.
	-ar	Creates deverbal nouns/ Vamos a <i>almacen-ar</i> la comida en el almacén.	Infinitival marker/ Tengo que <i>habl-ar</i> con Miguel.

<sup>4</sup> In other words, the *-o* and *-a* suffixes do not encode one particular semantic feature across words. However, they can be clearly derivational because minimal pairs that only contrast in these suffixes have different meanings. In words that where these suffixes do mark gender, there is no counterpart that shares the opposite suffix. For example, *mochil-a* 'backpack' is a feminine noun; *mochil-o* is not a word in Spanish. With the derivational meaning of these suffixes, there are always *-o* or *-a* counterparts (e.g., *frut-o* and *frut-a*) that have different meanings.

### 3.3. Results

Because this is a pilot study, a small sample of each language group was selected. Non-parametric tests were utilized in analyzing the data provided because of the assumption of non-standard distribution when using small sample sizes. Figure 1 shows the distribution of inflectional and derivational definitions for each language group.

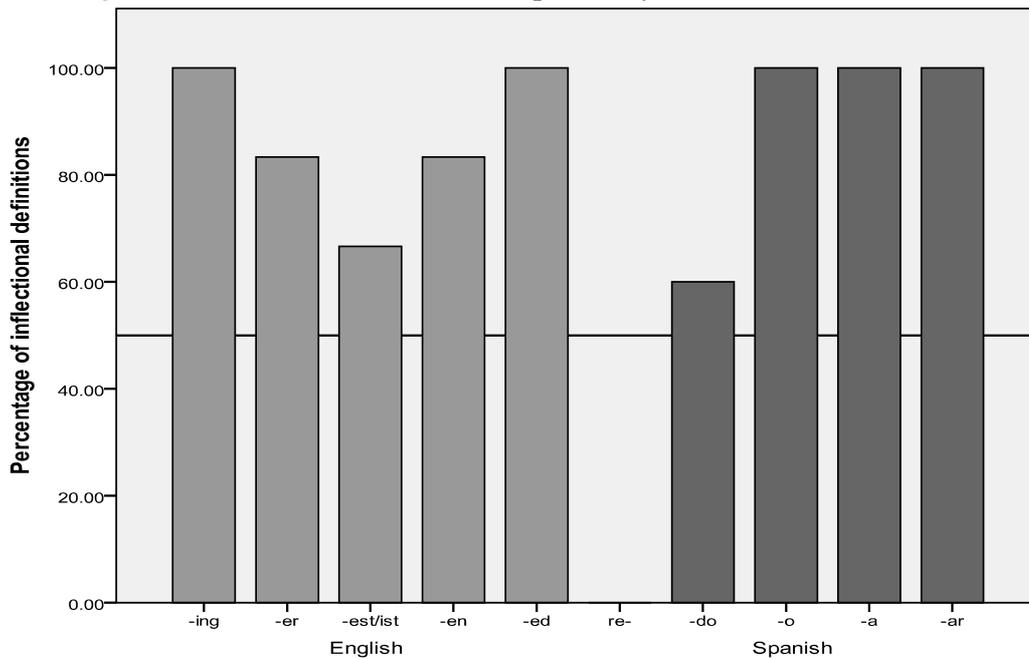
**Fig. 1:** Distribution of responses



Of the English-speaking participant responses, twenty-six of thirty possible responses (86.67%) were inflectional while four of thirty possible responses (13.33%) were derivational. Of the Spanish-speaking participant responses, twenty-one of thirty possible responses (70.0%) were inflectional while eight of thirty possible responses (26.67%) were derivational. One response could not be determined to be inflectional or derivational

(3.33%) and was not used in any further calculations<sup>5</sup>. Figure 2 shows the distribution of each suffix with respect to inflectional definitions.

**Fig. 2:** Distribution of inflectional responses by affix



The percentages in Figure 2 were calculated by dividing the number of inflectional responses by the total number of participants in each language group (total possible responses for each affix) (6). Six of six responses (100.00%) were inflectional for *-ing*, *-ed*, *-o*, *-a*, and *-ar*; five of six responses (83.33%) were inflectional for *-er* and *-en*; four of six

---

<sup>5</sup> The definition that this participant wrote was “doble” *double*. All other responses from this participant were consistent, as were all other responses in the study, with either derivational or inflectional meanings.

responses (66.67%) were inflectional for *-est/ist*; three of five responses (60.00%), one response not being counted, were inflectional for *-do*; and zero of six responses (0.00%) were inflectional for *re-*. The derivational responses are the inverses of the inflectional responses per affix.

Percentages of derivational and inflectional definitions were calculated for each participant by dividing the total amount of derivational or inflectional definitions by the possible amount of definitions (5). The percentages of total derivational definitions per participant ( $Mdn=20$ ) were compared to the percentages of total inflectional definitions per participant ( $Mdn=80$ ) (across groups) by performing a related-samples Wilcoxon signed ranks test (all alpha levels were set at .05). The results showed that there was a significant difference between the percentage of the two types of definitions provided  $Z=3.09$ ,  $p=.002$ ,  $r=.89$ .

An independent-samples Mann-Whitney U test was performed to compare the percentages of derivational and inflectional definitions between English speakers and Spanish speakers. The results showed that there was not a significant difference between groups in percentage of derivational definitions,  $U=28.0$ ,  $p=.092$ ,  $r=.49$ ; or between groups in percentage of inflectional definitions,  $U=8.0$ ,  $p=.092$ ,  $r=.49$ .

## **4. Discussion**

The distribution of derivational and inflectional definitions across language groups clearly shows a strong tendency for participants to provide an inflectional definition. Although not all responses were inflectional, the difference between the inflectional and

derivational definitions is statistically significant in favor of an inflectional response. That participants responded with inflectional definitions most of the time does lend support for the actuality of a psychologically real division between derivation and inflection in as far as a first reactionary definition robustly attests such evidence. This begins to answer the first research question. This fact, however, is not completely free from interesting phenomena that question the conformity to strict separation between derivation and inflection. One interesting phenomenon is how the participants defined the Spanish prefix *re-*. All Spanish-speaking participants derivationally defined this prefix. This fact does not necessarily contradict the evidence for a psychological separation; in fact, it may strengthen the argument since there was no variation with this particular affix. However, it does bring up questions about possible frequency effects.

Although not intentionally, responses could have been based on the frequency of each affix in the language being either more frequently derivational or more frequently inflectional. Because this possibility does not fit into the scope of this study I cannot fully address this here. I argue, however, that frequency probably does not play a significant role in the English suffixes that were used in this study, aside from *-ing*. The *-ing* suffix is probably much more common as a progressive aspect marker than a deverbal abstract noun marker. The other affixes in English or Spanish are not more frequently derivational or inflectional to a significant degree although each affix may be more saliently derivational or inflectional. In other words, a particular suffix may be the only means for marking its inflectional meaning, while it is only one option for marking its derivational meaning. For example, *-er* is the only suffix that marks comparatives of inequality while it is not the only agentive marker making it more saliently inflectional. However, corpus-based studies that

seek to define the frequency of each affix used in this study with respect to inflection or derivation are needed to confirm these claims and explain whether frequency effects are better predictors of how we define affixes.

As for the second research question, whether Spanish speakers treat derivation and inflection the same way as English speakers, the results of this study support the position that language groups perform the same way concerning the derivation/inflection division. However, the treatment of *re-* is an indicator that perhaps there are other factors at play in the first reactions to affix pronunciation such as frequency or saliency as mentioned above. Another possible explanation of participants' treatment of *re-* is that this was the only prefix in used in the study. All other stimuli were suffixes. According to Katz, Rexer, and Lukatela (1991), suffixes tend to encode inflectional information in inflectional languages. Although these authors do not make such a claim, it is possible then that prefixes tend to be derivational, or at least usually serve more derivational processes than suffixes and that is why Spanish-speaking participants provided the derivational definition. Again, further research of frequency and saliency effects is needed to provide definite evidence for or against these possible factors.

One possible drawback to this study is the small size of the sample populations. In addition, the particular set of affixes used might possibly have affected which definition participants provided. Choosing attested homophonous affixes that are neutral in frequency and saliency and widening sample sizes and language groups is imperative to the further study on the possibility of a psychological derivation/inflection division.

In a future study on a psychologically real division between derivation and inflection, homophonous morphemes that do not show any natural frequency or saliency

effects should be used. If they exist, these can be obtained by analyzing the frequency of derivational and inflectional meanings conveyed by the target morphemes in an adult language natural speech corpus. Larger population samples should also be used so that statistical results can be more robust and generalizable. Additionally, a priming experiment would provide a more accepted method for the collection of cognitive process data. An experiment could be set up where primes consist of each homophonous affix in inflectional and derivational contexts and targets are bare affixes. After the target is shown, participants could be asked to define the affix, as was asked in this pilot study. If definitions did not line up with primes, this would show a psychologically real separation of derivation and inflection, if only frequency neutral affixes are used.

## **5. Conclusion**

In this pilot study, I have reviewed the literature that discusses the possibility and utility of a separation between derivational and inflectional processes. I have also presented a study that provides preliminary psychological evidence for a separation of derivation and inflection. Although preliminary research that can address frequency and saliency effects on retrieval of meaning for affixes remains to be carried out, the confirmation of a psychologically real division between derivation and inflection provides the means of formally defining these morphological processes. The participants in this study have begun to provide such evidence. They have also shown that there is no attestable difference between how native Spanish-speakers and English-speakers treat inflection and derivation. With bigger sample sizes and attested homophonous affixes that are neutral in frequency

and saliency, the possibility of providing concrete psychological evidence of a derivation/inflection division is promising. This line of research could then provide a psychological basis on which linguists could create a new set of criteria that distinguishes derivation and inflection. These criteria would be based on how our brains process morphemes rather than on how morphemes seem to pattern in relationship to each other, as do the criteria that Stump (2001) and Beard (2001) discuss which, as has been shown, are riddled with problems. In addition, this research can provide a psychological method for obtaining a derivational/inflectional division could be used to see how the counterexamples in section 2 can be explained using cognitive means.

## 6. References

- Badecker, W., Caramazza, A., (1989). A lexical distinction between inflection and derivation. *Linguistic Inquiry*, 20(1), 108-116.
- Beard, R. (2001). Derivation. In A. Spencer & A. M. Zwicky (Eds.), *The Handbook of Morphology*. Hoboken, NJ: John Wiley & Sons, 44-65.
- Booij, G. (1993). Against split morphology. In G. Booij & J. van Marle (Eds.), *Yearbook of Morphology 1993*, Dordrecht: Kluwer, 27-49.
- Booij, G. (1995). Inherent versus contextual inflection and the split morphology hypothesis. In G. Booij & J. van Marle (Eds.), *Yearbook of Morphology 1995*, Dordrecht: Kluwer, 1-16.
- Chomsky, N. (1970). Remarks on nominalization. In R. Jacobs and P. Rosenbaum (Eds.), *Readings in transformational grammar*, Waltham, Mass.: Ginn and Co., 184-221.
- Feldman, L. B., Soltano, E. G., Pastizzo, M. J., & Francis, S. E. (2004). What do graded effects of semantic transparency reveal about morphological processing?. *Brain and Language*, 90, 17-30.
- Gonnerman, L. M., Seidenberg, M. S., & Andersen, E. S. (2007). Graded semantic and phonological similarity effects in priming: Evidence for a distributed connectionist approach to morphology. *Journal of Experimental Psychology: General*, 136(2), 323-345.
- Katz, L., Rexer, K., & Lukatela, G. (1991). The processing of inflected words. *Psychological research*, 53(1). 25-32.
- Katamba, F. & Stonham, J. (2006). *Morphology*. (2<sup>nd</sup> edition) Houndsmill, England: Palgrave Macmillan.
- Lang, M. F. (1990). *Spanish Word Formation: Productive Derivational Morphology in the Modern Lexis*. New York: Routledge.
- Marslen-Wilson, W. D., Bozic, M., & Randall, B. (2008). Early decomposition in word recognition: Dissociating morphology, form, and meaning. *Language and Cognitive Processes*, 23(3), 394-421.
- Sánchez-Casas, R., Igoa, J. M., & García-Albea, J. E. (2003). On the representation of inflections and derivations: Data from Spanish. *Journal of Psycholinguistic Research*, 32(6), 621-668.

- Scalise, S. (1986). *Generative Morphology*. (2<sup>nd</sup> edition). Dordrecht: Foris.
- Stump, G. T. (1991). A paradigm-based theory of morphosemantic mismatches. *Language*, 67(4), 675-725.
- Stump, G. T. (1993). How peculiar is evaluative morphology?. *Journal of Linguistics*, 29(1), 1-36.
- Stump, G.T. (2001). Inflection. In A. Spencer & A. M. Zwicky (Eds.), *The Handbook of Morphology*. Hoboken, NJ: John Wiley & Sons, 13-43.