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Position Shifts in Spanish Translations of Charles Darwin's On the Origin of Species by Natural Selection

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Abstract

Previous studies (Brisset, 2002; Vandepitte *et al.*, 2011) have compared the amount of certainty expressed in Charles Darwin's *On the Origin of Species* with that expressed in translations of the work. This thesis adds Spanish translations to this line of investigation, analyzing the 1877 translation by Godínez and the 1921 translation by Zulueta of *On the Origin of Species*. Focusing on the translation of utterances that contain certain modal expressions, I find that the translation by Godínez (1877) exhibits significantly more certainty than the source text, whereas that of Zulueta (1921) shows no such shift.

1 Introduction

Charles Darwin's *On the Origin of Species by Means of Natural Selection, or the Preservation of Favoured Races in the Struggle for Life* changed the study of biology forever with its publication in 1859. The theory of evolution by natural selection proposed that biology, including all living things and in particular human beings, is governed by unalterable laws in the same

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way that gravity controls the motion of the planets. The theory also directly contradicted a literal interpretation of the Biblical story of creation (Genesis 1:27, New International Version) and was thus deeply at odds with the Church. Although the theory of evolution by means of natural selection has long been accepted by the scientific community (see, e.g., IAP Member Academies, 2006), and the Church of England (2008) ultimately issued an apology to Charles Darwin (“Charles Darwin: 200 years from your birth, the Church of England owes you an apology for misunderstanding you and, by getting our first reaction wrong, encouraging others to misunderstand you still...”), in some circles Darwin’s theory remains controversial. For example, the teaching of creationism in schools has been the topic of many court cases in the United States (Berkman and Plutzer, 2010), and a recent report (Berkman and Plutzer, 2011) estimated that only 28% of high school biology teachers in the United States consistently teach the theory of evolution according to the guidelines set forth by the National Research Council (1996). Thus Darwin’s seminal work remains important today, not only in science but in society as well.

When *On the Origin of Species* was published, English was not the lingua franca of the scientific community (see, e.g., European Commission, 2011) and translations were of great importance for disseminating knowledge among the scientific community as well as the general population. Translations of *On the Origin of Species* date back nearly as far as the original work, with the first German translation appearing in the same year as the English original (Battaner and Brumme, 2009). The early French translation by Clemence Royer (1862) has been criticized for its use of the translator’s own voice and the inclusion of an “anticlerical and materialist preface” (Vandepitte *et al.*, 2011, pg. 277). Today there are over 150 translations of *On the Origin of Species*, into over 40 languages (van Wyhe, 2002).

This thesis analyzes differences in style among Darwin’s *On the Origin of Species* and two Spanish translations, focusing specifically on shifts in *epistemic stance* or *modality* (Palmer, 1979; Biber, Johansson, Leech, Conrad, and Finegan, 1999). Epistemic modality refers to the degree of confidence or certainty (or lack thereof) expressed by an author or a speaker. For example, the statement “It will rain tomorrow” expresses more certainty than the statement “It will probably rain tomorrow,” and both express more certainty than “It may rain tomorrow.” Using Vandepitte *et al.* (2011) as a model, I define a collection of English terms that represent varying degrees of certainty. I then analyze every utterance containing any of these terms in Chapter 4 of *On the Origin of Species*, Darwin’s original and the two translations, to determine whether either translation exhibits a shift in epistemic

modality, i.e., if it exhibits more or less certainty than the source text.

The rest of this thesis is organized as follows. Section 2 summarizes existing literature on epistemic stance, focusing on differences between English and Spanish texts, both in original works and translations. Section 3 provides background on the two translations analyzed here. Section 4 describes the Dutch study that inspired this thesis as well as the changes in methodology made to analyze Spanish translations. Section 5 presents results of the analysis and Section 6 concludes with a discussion of the results. A first Appendix transcribes all analyzed utterances from *On the Origin of Species*, and a second Appendix presents a brief analysis of another text on evolution (Eikenberry and Waldron, 1930) and its Spanish translation by Zulueta (1936).

2 Epistemic Modality and its Expression in Different Languages

According to Coates (1995, pg. 55), epistemic modality “is concerned with the speaker’s assumptions or assessment of possibilities, and in most cases it indicates the speaker’s confidence or lack of confidence in the truth of the proposition expressed.” Epistemic modality is widely considered to be a part of the broader concept of *hedging* (Martín Martín, 2001), defined by Hübler (1983; pg. 23) as any “manipulative, non-direct sentence strategy of saying less than one means.” Studies of epistemic modality often focus on words or phrases that express differing degrees of certainty or, more accurately, uncertainty (see Coates (1995), Nordlinger and Traugott (1997), and Aijmer (1997) for English examples; and Cornillie (2010), Mora Bustos (2009), and Squartini (2004) for Spanish examples). Although there is no universally accepted categorization of modality (Nuyts, 2006), authors typically construct a scale of words or categories according to increasing levels of certainty (Vandepitte *et al.*, 2011). See, e.g., Resinger (2010) for an English scale and Carretero (1992) for a Spanish scale.

The lack of a modal word or phrase is often considered to express the highest degree of certainty or author commitment (Huddleston and Pullum, 2002). Going further, Ramón (2009, pg. 81) argues that the use of the adverb *certainly* in English is in fact used when the author or speaker is *not* certain; this would suggest that a phrase with any modal expresses less certainty than a phrase without a modal, for example, that the phrase *he wrote it himself*

expresses more certainty than *he certainly wrote it himself*.¹

Various studies have considered differences in scientific or academic writing style across languages and cultures (see, for example, Clyne, 1991; Ventola and Mauranen, 1991; Kussmaul, 1997; Martín Martín, 2001; Vold, 2006; Kranich, 2009). Focusing on academic papers written originally in English, Spanish, and German, Resinger (2010) found that Spanish articles used less positioning (Skelton, 1997) – that is, less “direct expression of the authors’ own judgments” (Resinger, 2010) – and that phrases expressing possibility (one of the lowest degrees of certainty on the scale used in that study) are nearly twice as frequent in English texts than in Spanish. Comparing psychology texts in English and Spanish, Martín (2001) finds a higher use of epistemic modality devices in English than in Spanish. Vold (2006) found more hedges (that is, more direct expressions of uncertainty) in English and Norwegian research articles than in French articles. Outside the world of academic texts, Villar Conde (2002) compared speech patterns in English, Spanish, and Gallego and also found more positioning in spoken English, with a higher frequency of the phrase “I think” in English than in Spanish (or Gallego). Thus the literature suggests that English speakers tend to express uncertainty more frequently and more directly than speakers of Spanish or other Romance languages. Of particular relevance to this thesis, Darwin seems to have taken great care to avoid overstating conclusions in *On the Origin of Species*, and the text abounds with phrases like “I *think* we shall see that...” and “Thus... it *might* be a great advantage...” (emphasis mine).

Ramón (2009) analyzed epistemic modality in English source texts and Spanish translations, focusing on the treatment of the epistemic adverbs *certainly*, *probably*, and *possibly* in the source texts, and found that the translations tended to express somewhat more certainty than the source texts. In particular, the most common treatment of *possibly* was to omit it from the translation, thereby giving a statement expressing more certainty. Studies of the treatment of epistemic devices in translations to other languages include Aijmer (1998; Swedish), al Qinaï (2008; Arabic), and Krainch (2009; German). Of particular interest to this thesis is Vandepitte *et al.* (2011), which analyzes two Dutch translations of Darwin’s *On the Origin of Species* with respect to epistemic modality. The authors found that both Dutch translations (one from 1860 and one from 2000) exhibited shifts towards expressing greater certainty, and that the shift was more pronounced in the 1860 translation than in the 2000 translation.

¹Sample phrases from Vandepitte *et al.* (2011), although there the authors argue that the two phrases do express the same degree of certainty.

Differences in degree of certainty expressed may vary within a language as well, depending on the situation or genre; for example, Fernández Sanmartín (2009) found qualitative differences in the expression of epistemic modality in Spanish conversation versus Spanish medical texts.

3 Spanish Translations of *On the Origin of Species*

The first Spanish translations of *On the Origin of Species* appeared in 1872, each using the 1861 third edition as the source text (Brumme, 2013). One of these, by a translator whose identity remains unknown, contained a preface by Clémence-Augustine Royer, whose French translation of *On the Origin of Species* was highly controversial (Vandepitte *et al.*, 2011; Brisset, 2002), and may have in fact used Royer’s translation as source text (Battaner and Brumme, 2009). The other translation of 1872, by Juan Vilanova y Piera, appeared in *La Creación: Historia Natural* and was in fact more of a summary than a direct translation, with many examples omitted (Brumme, 2013).

The first complete, authorized translation of *On the Origin of Species*, using Darwin’s English 6th edition (1872) as source text, was published in 1877 and translated by Enrique Godínez (Gomis Blanco and Josa Llorca, 2009). Godínez was born in Madrid in 1845 and began his career in the navy, spending many years in the Caribbean. In 1871 he began a career in journalism in the United States, and began his translation of *On the Origin of Species* in Madrid in 1876 (Gomis Blanco and Josa Llorca, 2009). Godínez had personally written to Darwin proposing the translation, and Darwin responded positively. On receiving the completed translation, Darwin replied that he could not review the manuscript due to his poor health and limited knowledge of the Spanish language, but that he had read a few pages which seemed to him “very clearly expressed” (Gomis Blanco and Josa Llorca, 2009, note 66). Godínez continued working in translation and publishing until his death in 1894.

Antonio de Zulueta y Escolano provided another complete translation of *On the Origin of Species*, also using Darwin’s 6th edition as source text, in 1921. Zulueta, born in Barcelona in 1885, studied at the University of Madrid as well as the Sorbonne in Paris and the Koch Institute in Berlin, ultimately receiving a Doctorate in Sciences from the University of Madrid in 1910 (de Zulueta, 1998). Zulueta directed the genetics laboratory at the

National Museum of Natural Sciences in Madrid (Pelayo, 2009) and was also Professor of Biology at the University of Madrid and Professor of Genetics at the Conde Foundation of Cartagena (de Zulueta, 1998). Although primarily a researcher, Zulueta also translated several other scientific works, including William Scott's *The Theory of Evolution, with special reference to the evidence upon which it is founded*, in 1920; Thomas Hunt Morgan's *A Critique of the theory of evolution*, in 1919 (Pelayo, 2009); and Eikenberry and Waldron's textbook *Educational Biology*, in 1936. Zulueta died in 1971.

This thesis will analyze the translations by Godínez and Zulueta: Godínez is of interest for being the first complete translation of *On the Origin of Species* known to have used Darwin's English version as the source text, while Zulueta has proved to be arguably one of the best and most important (Ayala, 2009). First published in 1921, the Zulueta translation remains in print and was issued as the anniversary edition commemorating the 200th anniversary of Darwin's birth and 150th anniversary of the publication of *On the Origin of Species*. Moreover, the differences in backgrounds of the two translators provide an interesting backdrop to the analysis. In examples I will refer to the Godínez and Zulueta translations as TT1877 and TT1921, respectively.

4 Methodology: Analyzing Epistemic Shifts Between Source and Target Texts

The motivation for this thesis is the analysis by Vandepitte *et al.* (2011) of epistemic shifts in two Dutch translations of the first edition of *On the Origin of Species*. The authors considered a five-point scale of modality, the English portion of which is reproduced in Table 1. They then found all instances of the words in Table 1 in the source text and, after discarding those that were not relevant (see below), labeled each utterance in both the source text and the two translations as being in category 1, 2, 3, 4, or 5. Vandepitte *et al.* (2011) also analyzed shifts in modality *orientation* – that is, the degree to which a statement is objective versus subjective – in the Dutch translations; I will not consider modality orientation here.

Category Level	Category Description	English Words
5	Certainty	certainly
4	Quasi certainty	will
3	Probability	probable
2	Possibility	possible may
1	Tentative possibility	might

Table 1: Modality values used in Vandepitte *et al.* (2011) and their expressions in English. A higher level indicates greater certainty.

The scheme shown in Table 1 presents some complications for analyzing Spanish translations of *On the Origin of Species*. First, in both translations considered, the words *might* and *may* are nearly always translated as the Spanish *poder*, although typically in different tenses (*might* is most often translated to *poder* in the conditional tense, whereas *may* is typically translated into the present indicative). There seems to be little research into the epistemic ordering of Spanish verbs in different tenses; for example Martín Martín (2001) maps the English verbs *may*, *might*, and *can* all to *poder* with no discussion of verbal tenses. Moreover, when investigating epistemic modality in Spanish, I found no mention of the use of the future tense as indicating a high degree of certainty (as in Category 4, quasi certainty, in Table 1). Determining an epistemic ordering of the different tenses of *poder* or a base level of certainty for the future tense would require a linguistic analysis that is beyond the scope of this thesis. Therefore I will only consider categories two, three, and five, and will leave the analysis of the translation of *might* and *will* to possible future work. The scheme and English modal expressions I will use for analysis, along with their common Spanish translations, is shown in Table 2. The scheme used here is similar to that of Ramón (2009), with the exceptions that the Ramón study focused on adverbs while the scheme used here also includes the epistemic verb *may*.

Category Description	English Words	Spanish Words
Certainty	certainly	<i>ciertamente</i> <i>es cierto</i> <i>es seguro</i> <i>desde luego</i>
Probability	probable probably	<i>probable</i> <i>probablemente</i> <i>es probable que</i>
Possibility	possible possibly may	<i>posible</i> <i>posiblemente</i> <i>es posible que</i> <i>poder</i>

Table 2: Modality categories used to analyze translation of *On the Origin of Species*, and their expressions in English and Spanish.

Not all utterances of the words in Table 2 are indicative of modality; for example, the word *possible* in Example 1 below does not relate to the author’s level of certainty. Utterances such as these that do not reflect a modal stance are excluded from the analysis.

Example 1

ST: On the other hand, the ordinary belief that the amount of **possible** variation is a strictly limited quantity is likewise a simple assumption.

Following Vandepitte *et al.* (2011), I will also exclude negative modalities as in Example 2 below.

Example 2

ST: Now, it is **scarcely possible** for insects to fly from flower and flower, and not to carry pollen from one to the other, to the great good of the plant.

Also following Vandepitte *et al.* (2011), I exclude modals in reflective phrases, as in Example 3 below.

Example 3

ST: What reason, it **may** be asked, is there for supposing in these cases that two individuals ever concur in reproduction?

Finally, rather than applying a numerical value to the certainty level of each utterance containing a modal term, I label the translations as expressing either more, less, or the same level of certainty. Labeling the translations this way simplifies the analysis linguistically while maintaining the primary

goal of examining whether the translations contain epistemic shifts. For example, the subjunctive/conditional pairing in Example 4 could arguably mean the statement expresses less certainty than the presence of the word *certainly* would typically imply, and in fact Vandepitte *et al.* (2011) label the utterance as category 4 (quasi-certainty) even though the default level for the word *certainly* is category 5. Whatever the level of certainty in the source text, however, it is clear that the translation expresses the same level of certainty, and I believe it is this comparison, rather than the absolute certainty levels of the two texts, that is of ultimate importance. (Vandepitte *et al.* (2011; pg. 281) also make the point that overall comparisons between texts are more interesting absolute levels.)

Example 4

ST: If the country were open on its borders, new forms **would certainly** immigrate...

TT1921: Si el país estaba abierto en sus límites, **immigrarían seguramente** formas nuevas...

In more detail, the analysis is carried out as follows. I found every utterance in the source text that contained any of the words in Table 2. After excluding instances of negative modality and modals in reflective phrases, I found the corresponding utterance in both Spanish translations. I then labeled each Spanish translation as expressing more certainty, less certainty, or the same degree of certainty as the source text. Finally, both overall and within each category, I calculate the number of utterances that are more or less certain in each translation, and test whether the results differ significantly between the two translations.

5 Results

After removing negative modalities, utterances that did not reflect uncertainty, and modals in reflective phrases (as in Examples 1, 2, and 3, respectively), 52 utterances of the terms in Table 2 remained in the source text. (This is about one quarter of the 224 analyzed by Vandepitte *et al.*, 2011). Table 3 shows the frequency of each analyzed term in the utterances analyzed.

Word	Frequency
certainly	5
probable	6
probably	8
possible	2
possibly	1
may	30

Table 3: Frequency of modal words in utterances analyzed, grouped by certainty category. *May* is clearly the most frequent among them.

In Zulueta’s translation, none of these utterances exhibited a modal shift, whereas in the translation by Godínez five of the utterances exhibited a shift, all expressing more certainty than the source text. Thus the majority of the utterances in both translations exhibited no change in uncertainty.

Examples 5, 6, and 7 below show cases from each of the three categories where the translations showed the same degree of certainty as the source text. The two translations in Example 5 differ from each other, in particular they use different verbs to translate *effect*; however both translate the modal *may* as the present tense form of *poder*, and both express a similar degree of certainty as the original.

Example 5

ST: ...these modifications **may effect**, through correlation, the structure of the adult.

TT1877: ...estas modificaciones **pueden afectar** por la correlación la estructura del adulto.

TT1921: ...estas modificaciones **pueden influir**, por correlación, en la estructura del adulto.

The two translations in Example 6 are identical, and again exhibit no shifts from the degree of certainty expressed in the original.

Example 6

ST: ...it is **far more probable** that each form remains for long periods unaltered...

TT1877: ...es **mucho más probable** que cada forma permanezca inalterable durante largos períodos...

TT1921: ...es **mucho más probable** que cada forma permanezca inalterable durante largos períodos...

In Example 7 we again see some differences between the two translations, in particular the modal *certainly* is translated slightly differently; but here

again the degree of certainty in both translations is comparable to that of the original.

Example 7

ST: But if the area be large, its several districts will **almost certainly present** different conditions of life...

TT1877: Pero si el área fuese grande, sus diferentes partes **presentarán casi seguramente** diferentes condiciones de vida ...

TT1921: Pero si la región es grande, sus diferentes distritos **presentarán casi con seguridad** condiciones diferentes de vida...

All modal shifts in the Godínez translation occur in the category of Possibility and, in particular, all involve the modal verb *may*. Because the number of utterances with modal shifts is small, I will present and analyze each of them in turn. For comparison I present both translations, although only that of Godínez exhibits modal shifts. In Example 8 Godínez takes some liberty with the translation of *may well turn*, and the phrase *bastan y sobran para inclinar* (in English, *are more than enough to turn*) retains none of the uncertainty implied by the modal term *may* in the original.

Example 8

ST: Under Nature, the slightest differences of structure or constitution **may well turn** the nicely balanced scale in the struggle for life...

TT1877: En la naturaleza, las diferencias más pequeñas de estructura ó constitucion, **bastan y sobran para inclinar** la exquisitamente compensada balanza en la lucha por la existencia...

TT1921: En la naturaleza, las más ligeras diferencias de estructura o constitución **pueden muy bien inclinar** la balanza, tan delicadamente equilibrada, en la lucha por la existencia...

In Examples 9-12, the Godínez translation effectively drops the word *may*, yielding utterances that lack a modal and therefore express more certainty than the original. In all four examples Zulueta translates *may* as *poder* (although its translation to the conditional tense in Example 11 may be worthy of further analysis).

Example 9

ST: ...only a third, fifth, or tenth part of the individuals **may have been thus affected**...

TT1877: ...solamente **han sido afectados** de este modo la tercera, la quinta ó la décima parte de los individuos...

TT1921: ...**puede haber sido modificada** así sólo una tercera parte o una décima parte de los individuos...

Example 10

ST: ...although the male and female flowers **may be produced** on the same tree...

TT1877: ...aunque el mismo árbol **produzca** flores machos y hembras...

TT1921: ...aunque las flores masculinas y femeninas **puedan ser producidas** en el mismo árbol...

Example 11

ST: ...these three forms **may still be** only well-marked varieties...

TT1877: ...estas tres formas **serán todavía** solamente variedades bien marcadas...

TT1921: ...estas tres formas **podrían ser todavía** sólo variedades bien señaladas...

Example 12

ST: ...o14, e14, and m14 ... will be widely different from the other five species, and **may constitute** a sub-genus or a distinct genus.

TT1877: ...o14, e14 y m14 ... serán muy diferentes de las otras cinco especies, **constituyendo** un subgénero ó género distinto.

TT1921: ...a14, e14 y m14 ... serán muy diferentes de las otras cinco especies y **pueden constituir** un subgénero o un género distinto.

Although the number of modality shifts in the two translations considered here is fairly small, it is notable both that only the Godínez translation exhibits any shifts, and also that all of the shifts are towards more certainty. To answer the question of whether the five shifts towards increased certainty in the Godínez translation compared to the lack of shifts in Zuluetea's translation represent an important or meaningful difference, we can perform a statistical analysis.

Of the 52 phrases analyzed here, the two translations differed in five of the phrases; of the five phrases that differ, the Godínez translation always exhibits the higher level of certainty. Thus the Godínez translation exhibits increased certainty at a rate of 5 / 52 or 10%, and never exhibits decreased certainty. The question of interest is whether this observed shift towards more certainty is statistically significant. Performing a standard t-test based on the large-sample normal approximation gives a p-value of 0.024. Thus at the commonly-used significance level of $\alpha = 0.05$, we conclude that the

translations do differ significantly from each other in terms of modality shifts, and in particular that the Godínez translation exhibits significantly more certainty than either the Zulueta translation or the source text.

Finally, I will present an additional example that may make our results somewhat stronger. If we accept Ramón's (2009) claim that a phrase containing the word *certainly* actually expresses less certainty than the same phrase without the word *certainly*, then we have one additional instance where the Godínez translation expresses more certainty than Darwin's original while the Zulueta translation exhibits the same level of certainty as the original. Example 13 below shows the original and both translations, with *certainly* omitted from the Godínez translation.

Example 13

ST: ...this **certainly** cannot be disputed...

TT1877: ...esto tampoco puede disputarse seriamente...

TT1921: ...esto, **ciertamente**, es indiscutible...

If we consider that six of the 52 utterances express more certainty in the Godínez translation compared to that of Zulueta, the p-value for testing whether the Godínez translation exhibits significantly more certainty drops to 0.013.

6 Discussion

Previous studies (Vandepitte *et al.*, 2011; Brisset, 2002) have shown that specific French and Dutch translations of *On the Origin of Species* exhibit modality shifts, with the overall trend towards expressing more certainty than the original text. Of the two Spanish translations considered here, that of Godínez does exhibit modality shifts in the same direction as those found in the French and Dutch studies, although the magnitude of the shift appears to be lower. Vandepitte *et al.* (2011) found shifts toward more certainty in 34% and 12% of utterances considered in the older and newer Dutch translations, respectively². The Spanish translation by Zulueta, on the other hand, exhibits no modality shifts in the set of modal terms considered here. As in Vandepitte *et al.* (2011), the more recent translation considered here (although Zulueta's translation is nearly 100 years old, it is the more recent

²Note, however, that the Vandepitte *et al.* study used both a larger set of modal terms (see Table 1 versus Table 2) and a different source text (first edition versus sixth edition of *On the Origin of Species*) than the current study.

of the two considered here and is still widely read) “appears to have followed the source text as closely as possible” (pg. 292).

The increased certainty exhibited in Royer’s French translation has been attributed mainly to Royer’s own strong evolutionary views (Vandepitte *et al.*, 2011; Brisset, 2002). Vandepitte *et al.* (2011) attribute the shift in the older Dutch translation largely to “the less rigorous translation principles that prevailed in the 19th century” (pg. 295), and suggest that the less-pronounced (but nonetheless present) shift in the more recent translation may be due to inherent differences between the English and Dutch languages. In the Spanish case, there is no evidence that Godínez was a radical evolutionist, nor does it seem very likely that Spanish translation principles changed dramatically in the 44 years between the two translations. Moreover, the lack of shifts in the Zulueta translation suggests that inherent language differences are an unlikely explanation for the shifts seen in the Godínez translation.

Instead, the situation in Spain at the time of the two translations and what is known about the translators themselves may shed some light on the differences between the two translations. Prior to the Spanish Revolution of 1868, in which Queen Isabella II was overthrown and which led to a brief period of liberalization and democracy, Darwinism had almost no presence in Spain (Glick, 1974, pg. 307). In the years between the Revolution of 1868 and Godínez’s 1877 translation, Darwinism gained significant ground in Spain: For example, noted Spanish neurohistologist Santiago Ramon y Cajal “recalled that he first began reading Lamarck, Spencer, and Darwin around 1874-1875, after he had received his *licencia* in medicine” (Glick, 1974, pg. 316)³, and a series of articles propogating Darwinian ideas was published in *Revista Mensual de Filosofía, Literatura y Ciencias* between 1869 and 1874 (Glick, 1974, pg. 324). At the time of Godínez’s 1877 translation, not only were Darwin’s works available in Spanish (the two previous translations of *On the Origin of Species*, as well as an 1876 translation of Darwin’s *The Descent of Man*, 1871), but “most Spanish participants in the evolution debate preferred to read the *Origin* and *Descent* in French” (Glick, 1974, pg. 311). The Spanish scientific community was therefore well aware of Darwin’s ideas at the time of the Godínez translation, and in fact by that time most Spanish scientists accepted Darwinism (Glick, 1974, pg. 333). Thus the situation in Spain around the time of the 1877 translation suggests that Godínez may not have specifically had a scientific audience in mind for his translation, as the scientific community was already quite familiar with Darwin by the late

³Glick notes that Cajal may in fact have been introduced to evolutionary ideas a few years earlier.

1870's.

The fact that Godínez was not a scientist himself also suggests that he may not have had a scientific audience in mind for his translation. Godínez was a journalist with a navy background, and no known scientific training (Gomis Blanco and Josa Llorca, 2009). It is perhaps not surprising, then, that Godínez may have used a bit of journalistic flair (see Example 8 in particular) or attempted to tell a slightly more convincing story, as evidenced by the modal shifts toward expressing more certainty. Finally, the shift seen in the Godínez translation is in line with the differences in modality expression between the English and Spanish languages discussed in Section 2; that is, English tends to express uncertainty more frequently and more directly, and Spanish translations of English source texts tend to express more certainty than the original.

Zulueta, on the other hand, was an academic scientist who published his own research in addition to translations of various scientific texts (Gomis Blanco and Josa Llorca, 2009). Zulueta's translation style seems understandably to be governed largely by scientific rigor, and perhaps less by the norms of English to Spanish translation, as demonstrated here by the lack of modality shifts. In Appendix II, I consider Zulueta's translation of the textbook *Educational Biology* (1930), focusing on the chapter on evolution. Although the text is much shorter and provides only seven relevant utterances of the modal terms considered here, in all seven cases the translation expressed the same degree of certainty as the source text. This parallel text provides another example of Zulueta's direct style of translation, again with no evidence of position shifts.

The analysis presented here is based on only a few modal expressions, and a more thorough linguistic analysis with additional modal terms and categories seems a promising area for future research. In particular, inclusion of the modal verb *might* and an expanded analysis of the degree of certainty expressed by the Spanish *poder* in different verbal tenses would provide a larger corpus of phrases to analyse as well as a perhaps more detailed picture of modality shifts. Although the work could certainly be expanded upon, I believe that the analysis presented here has shown convincingly that, for the given set of modal expressions, the Godínez translations shows shifts towards expressing more certainty while the Zulueta translation does not. Moreover, this result is consistent with the situation in Spain at the time of the translations as well as with the backgrounds of the translators themselves.

In addition to expanding the set of modal expressions in the current analysis, considering other Spanish translations or other chapters of *On the Origin of*

Species could also provide interesting additional conclusions. Finally, I hope this research inspires similar investigations in other languages.

Appendix I: Transcription of all analyzed utterances

Below are all the utterances analyzed in this work. They are grouped by modality category and then listed chronologically as they appeared in the texts.

Category: Certainty

Utterance 1

ST: If the country were open on its borders, new forms **would certainly immigrate**, and this would likewise seriously disturb the relations of some of the former inhabitants.

TT1877: Si el país tenía abiertas las fronteras **immigrarían á él ciertamente** nuevas formas y esto perturbaría de igual modo sériamente las relaciones de algunos de los primeros habitantes.

TT1921: Si el país estaba abierto en sus limites, **immigrarían seguramente** formas nuevas, y esto perturbaría también gravemente las relaciones de algunos de los habitantes anteriores.

Utterance 2

ST: But still there are many hermaphrodite animals which **certainly** do not habitually pair, and a vast majority of plants are hemaphrodites.

TT1877: Pero todavía quedan muchos animales hermafroditas, que **ciertamente** no tienen la costumbre de aparear, y una vasta mayoría de plantas es hermafrodita.

TT1921: Pero a pesar de esto hay muchos animales hermafroditas que **positivamente** no se aparean habitualmente, y una gran mayoría de plantas son hermafroditas.

Utterance 3

ST: But if the area be large, its several districts will **almost certainly** present different conditions of life...

TT1877: Pero si el area fuese grande, sus diferentes partes presentarán **casi seguramente** diferentes condiciones de vida...

TT1921: Pero si la región es grande, sus diferentes distritos presentarán **casi con seguridad** condiciones diferentes de vida...

Utterance 4

ST: In the first place, varieties... **certainly** differ far less from each other than do good and distinct species.

TT1877: en primer lugar, las variedades... difieren **ciertamente** mucho menos entre sí que las especies verdaderas y distintas.

TT1921: En primer lugar, las variedades... difieren **ciertamente** mucho menos entre sí que las especies verdaderas y distintas.

Utterance 5

ST: ...this **certainly** cannot be disputed...

TT1877: ...esto tampoco puede disputarse seriamente...

TT1921: ...esto, **ciertamente**, es indiscutible...

Category: Probability

Utterance 6

ST: We shall best understand the **probable** course of natural selection...

TT1877: Comprenderemos mejor el curso **probable** de la selección natural...

TT1921: Comprenderemos mejor la marcha **probable** de la selección natural...

Utterance 7

ST: ...some species will **probably** become extinct.

TT1877: ...algunas especies se extinguirán **probablemente**.

TT1921: ...algunas especies llegarán **probablemente** a extinguirse.

Utterance 8

ST: ...the service rendered by isolation... is **probably** greater even than I supposed.

TT1877: ...los servicios que presta el aislamiento... son **probablemente** mayores aún que lo que yo suponía.

TT1921: ...el servicio que presta el aislamiento... es **probablemente** aún mayor de lo que yo supuse;

Utterance 9

ST: The **Probable** Effects of the Action of Natural Selection...

TT1877: Efectos **probables** de la acción de la selección natural...

TT1921: EFECTOS **PROBABLES** DE LA ACCIÓN DE LA SELECCIÓN NATURAL...

Utterance 10

ST: ...it is **far more probable** that each form remains...

TT1877: ...es **mucho más probable** que cada forma permanezca...

TT1921: ...es **mucho más probable** que cada forma permanezca...

Utterance 11

ST: The modified offspring from the later and more highly improved branches in the lines of descent, will, **it is probable**, often take the place of...

TT1877: La descendencia modificada de las ramas últimas y más altamente mejoradas en las líneas de descendencia, **probablemente** tomará el lugar de...

TT1921: La descendencia modificada de las ramas más modernas y más perfeccionadas de las líneas de descendencia **probablemente** ocuparán con frecuencia el lugar de...

Utterance 12

ST: In a large genus it is **probable** that more than one species would vary.

TT1877: Es **probable** que en un género grande varíe más de una especie.

TT1921: En un número grande es **probable** que más de una especie tenga que variar.

Utterance 13

ST: So it **probably** will be with many whole collateral lines of descent...

TT1877: Esto **probablemente** sucederá á muchas líneas colaterales enteras de sucesion...

TT1921: Así ocurrirá **probablemente** con muchas ramas colaterales...

Utterance 14

ST: Their modified descendants... will **probably** have inherited some of the same advantages...

TT1877: Sus descendientes modificados... habrán heredado **probablemente** algunas de las mismas ventajas...

TT1921: Sus descendientes modificados... habrán heredado **probablemente** algunas ventajas...

Utterance 15

ST: ...other botanists, **probably** with more truth, look at the plants which have their several organs much modified and reduced in number as the highest.

TT1877: ...hay otros botánicos que, **probablemente** con más razón, consideran superiores aquellas plantas que tienen sus diversos órganos muy modificados reducidos en número.

TT1921: ...otros botánicos, **probablemente** con mayor razón, consideran como los superiores las plantas que tienen sus diferentes órganos muy modificados y reducidos en número.

Utterance 16

ST: The three lowest orders of mammals... **probably** interfere little with

each other.

TT1877: Los tres órdenes inferiores de mamíferos... **probablemente** tienen pocas relaciones unos con otros.

TT1921: Los tres órdenes inferiores de mamíferos... **probablemente** hay pocos conflictos entre ellos.

Utterance 17

ST: In no case, **probably**, has time sufficed for the utmost possible amount of development.

TT1877: **Probablemente** en ningún caso ha bastado el tiempo para la suma mayor posible de desarrollo.

TT1921: En ningún caso, **probablemente**, el tiempo ha sido suficiente para permitir todo el desarrollo posible.

Utterance 18

ST: Mr. Herbert Spencer would **probably** answer that...

TT1877: Mr. Herbert Spencer **probablemente** contestaría que...

TT1921: Mister Herbert Spencer contestaría **probablemente** que...

Utterance 19

ST: ...it **seems probable** that a sufficient number of species would soon become adapted...

TT1877: ...**parece probable** que un número suficiente de especies se adaptaría pronto...

TT1921: ...**parece probable** que un número suficiente de especies se adaptaría pronto...

Category: Possibility

Utterance 20

ST: Under Nature, the slightest differences of structure or constitution **may well turn** the nicely balanced scale in the struggle for life...

TT1877: En la naturaleza, las diferencias más pequeñas de estructura ó constitucion, **bastan y sobran para inclinar** la exquisitamente compensada balanza en la lucha por la existencia...

TT1921: En la naturaleza, las más ligeras diferencias de estructura o constitución **pueden muy bien inclinar** la balanza, tan delicadamente equilibrada, en la lucha por la existencia...

Utterance 21

ST: ...characters and structures, which we are apt to consider as of very trifling importance, **may thus be** acted on.

TT1877: ...los caracteres y las estructuras que estamos dispuestos á considerar de importancia muy secundaria, **pueden ser de este modo** influidos

por ella.

TT1921: ...caracteres y estructuras que estamos inclinados a considerar como de importancia insignificante **pueden ser** influidos por ella.

Utterance 22

ST: Natural selection **may modify and adapt** the larva of an insect to a score of contingencies...

TT1877: La seleccion natural **puede modificar y adaptar** la larva de un insecto á una porcion de contingencias...

TT1921: La selección natural **puede modificar y adaptar** la larva de un insecto a una porción de circunstancias...

Utterance 23

ST: ...and these modifications **may effect**, through correlation, the structure of the adult.

TT1877: ...y estas modificaciones **pueden afectar** por la correlacion la estructura del adulto.

TT1921: ...y estas modificaciones **pueden influir**, por correlación, en la estructura del adulto.

Utterance 24

ST: So, conversely, modifications in the adult **may affect** the structure of the larva...

TT1877: Así tambien, por el contrario, las modificaciones en el adulto **pueden afectar** la estructura de la larva...

TT1921: También, inversamente, modificaciones en el adulto **pueden influir** en la estructura de la larva...

Utterance 25

ST: **Thus it is rendered possible** for the two sexes to be modified through natural selection...

TT1877: **Así, pues, es posible** que los dos sexos se modifiquen por medio de la seleccion natural...

TT1921: **De este modo se hace posible** que los dos sexos se modifiquen, mediante selección natural...

Utterance 26

ST: ...though to them and to others, special means of defence **may be given** through means of sexual selection...

TT1877: ...aunque á ellos y á otros **pueda darles** la seleccion sexual especiales medios de defensa...

TT1921: ...aun cuando a ellos y a otros **pueden ser dados** medios especiales de defensa mediante la selección natural...

Utterance 27

ST: ...for the shield **may be** as important for victory, as the sword or spear.

TT1877: ...porque el escudo **puede ser** tan importante para la victoria como la espada ó la lanza.

TT1921: ...pues tan importante **puede ser** para la victoria el escudo como la espada o la lanza.

Utterance 28

ST: Or only a third, fifth, or tenth part of the individuals **may have been thus affected...**

TT1877: ...solamente **han sido afectados de este modo** la tercera, la quinta ó la décima parte de los individuos.

TT1921: ...**puede haber sido modificada así** sólo una tercera parte o una décima parte de los individuos...

Utterance 29

ST: **It may be worth while** to give another and more complex illustration of the action of natural selection.

TT1877: **Acaso valga la pena** de presentar otro ejemplo más complejo de la seleccion natural.

TT1921: **Valdría la pena** dar otro ejemplo más complejo de la acción de la selección natural.

Utterance 30

ST: ...although the male and female flowers **may be produced** on the same tree...

TT1877: ...aunque el mismo árbol **produzca** flores machos y hembras...

TT1921: aunque las flores masculinas y femeninas **puedan ser producidas** en el mismo árbol...

Utterance 31

ST: The tendency to reversion **may often check or prevent** the work...

TT1877: La tendencia al salto atrás, **puede á menudo estorbar ó impedir** el trabajo...

TT1921: La tendencia a la reversión **puede muchas veces dificultar o impedir** la labor...

Utterance 32

ST: ...two varieties of the same animal **may long remain distinct...**

TT1877: ...**pueden por mucho tiempo permanecer distintas** dos variedades del mismo animal...

TT1921: ...dos variedades del mismo animal **pueden permanecer distintas mucho tiempo...**

Utterance 33

ST: ...this **may sometimes be** of much importance.

TT1877: ...esto **algunas veces puede ser** de mucha importancia.

TT1921: ...esto, **a veces, puede ser** de mucha importancia.

Utterance 34

ST: But **we may thus deceive ourselves**...

TT1877: Pero **de este modo podemos engañarnos** á nosotros mismos...

TT1921: ...pero **podemos engañarnos**...

Utterance 35

ST: ...which **may have been effected** in the long course of time...

TT1877: que **pueden haberse efectuado** en el largo curso de los tiempos...

TT1921: ...que **pueden haber sido realizadas**, en el largo transcurso de tiempo...

Utterance 36

ST: ...a medium form **may often long endure**...

TT1877: ...una forma intermedia **puede á menudo durar mucho tiempo**...

TT1921: ...**con frecuencia** una forma media **puede durar mucho tiempo**...

Utterance 37

ST: ...a medium form **...may or may not produce** more than one modified descendant.

TT1877: ...una forma intermedia **puede ... producir ó no** más de un descendiente modificado.

TT1921: ...con frecuencia una forma media **... puede o no producir** más de una forma descendiente modificada.

Utterance 38

ST: ...although the amount of divergent modification **may have been augmented**.

TT1877: ...aunque **pueda haberse aumentado** la suma de modificacion divergente.

TT1921: ...aunque **puede haber aumentado** la divergencia de la modificacion.

Utterance 39

ST: ...these three forms **may still be** only well-marked varieties...

TT1877: ...estas tres formas **serán todavía** solamente variedades bien marcadas...

TT1921: ...estas tres formas **podrían ser todavía** sólo variedades bien señaladas...

Utterance 40

ST: The other nine species ... **may** for long but unequal periods continue to transmit unaltered descendants.

TT1877: Las otras especies ... **pueden** continuar trasmitiendo descendientes sin alteracion, durante períodos largos, aunque desiguales...

TT1921: Las otras nueve especies ... **pueden** continuar dando durante períodos largos, aunque desiguales, descendientes no modificados...

Utterance 41

ST: ...both **may** continue to exist.

TT1877: ...ambos **pueden** continuar existiendo.

TT1921: ... **pueden** ambos continuar viviendo.

Utterance 42

ST: ...o14, e14, and m14 ... will be widely different from the other five species, and **may constitute** a sub-genus or a distinct genus.

TT1877: ...o14, e14 y m14 ...serán muy diferentes de las otras cinco especies, **constituyendo** un subgénero ó género distinto.

TT1921: ...a14, e14 y m14 ... serán muy diferentes de las otras cinco especies y **pueden constituir** un subgénero o un género distinto.

Utterance 43

ST: ...each **may represent** a million or more generations...

TT1877: ...cada una **puede representar** un millon de generaciones ó más...

TT1921: cada una **puede representar** un millón de generaciones o más...

Utterance 44

ST: ...it **may also represent** a section of the successive strata...

TT1877: ...**puede tambien representar** una seccion de las capas sucesivas...

TT1921: ...**puede también representar** una sección de las capas sucesivas...

Utterance 45

ST: ...the earth **may have been** almost as well peopled...

TT1877: ...la tierra **puede haber estado** casi tan bien poblada...

TT1921: ...la tierra **pudo haber estado** casi tan bien poblada

Utterance 46

ST: ...**it is quite possible** for natural selection gradually to fit a being to a situation...

TT1877: ...**es completamente posible** para la seleccion natural hacer gradualmente á un ser adaptable á una situacion...

TT1921: ...**es por completo posible** a la selección natural adaptar un ser

a una situación...

Utterance 47

ST: Although organisation, on the whole, **may have advanced**...

TT1877: Aunque la organizacion en conjunto **pueda haber adelantado**...

TT1921: Aun cuando la organización, en conjunto, **pueda haber avanzado**...

Utterance 48

ST: ...under very simple conditions of life a high organisation would be of no service, **possibly would be of actual disservice**...

TT1877: ...una organizacion elevada, para nada serviría en condiciones muy simples de vida, y **hasta es posible que fuera nociva**...

TT1921: ...en condiciones sumamente sencillas de vida, una organización elevada no sería de utilidad alguna; **quizá sería un positivo perjuicio**...

Utterance 49

ST: On these principles, the nature of the affinities, and the generally well-defined distinctions between the innumerable organic beings in each class throughout the world, **may be explained**.

TT1877: Por estos principios **pueden explicarse** la naturaleza de las afinidades y las distinciones, generalmente bien definidas, entre los innumerables seres orgánicos de cada clase en todo el mundo.

TT1921: Según estos principios, **puede explicarse** la naturaleza de las afinidades y de las diferencias, generalmente bien definidas, que existen entre los innumerables seres orgánicos de cada clase en todo el mundo.

Utterance 50

ST: The green and budding twigs **may represent** existing species...

TT1877: Los renuevos verdes y florecientes **pueden representar** las especies que existen...

TT1921: las ramitas verdes y que dan brotes **pueden representar** especies vivientes...

Utterance 51

ST: ...those produced during former years **may represent** the long succession of extinct species.

TT1877: ...los producidos durante años anteriores **pueden representar** la larga sucesion de especies extinguidas.

TT1921: ...las producidas durante años anteriores **pueden representar** la larga sucesión de especies extinguidas.

Utterance 52

ST: ...these fallen branches of various sizes **may represent** those whole

orders...

TT1877: ...estas ramas caídas **pueden representar** aquellos órdenes...

TT1921: ...estas ramas caídas, de varios tamaños, **pueden representar** todos aquellos órdenes...

Appendix II: Zulueta's Translation of *Educational Biology*

Zulueta's 1936 translation of Eikenberry and Waldron's textbook *Educational Biology* (1930) provides a parallel text to further investigate his style for translating modalities. I applied the same analysis of modalities as in the Darwin texts to Zulueta's translation of *Educational Biology's* chapter on evolution (titled *The Descent of Living Things* in the source text and *La Evolución de los Seres Vivos* in the translation). It should be noted that Zulueta's translation leaves out some text from the original, in particular parts that focus on the flora and fauna of the United States as examples.⁴ As these omissions seem to be largely based on geographical relevance to the target audience and not on anything related to position or modality, it seems reasonable to proceed with the analysis ignoring those untranslated parts of the source text.

After applying the same filters as discussed in Section 4 (removing utterances that do not reflect a modal stance, negative modalities, and modals in reflective phrases), only seven utterances remained. All are listed below, labeled as ST (source text) and TT (target text), and in no cases does the translation express more (or less) certainty than the source text. Although the number of utterances from this parallel text is quite small, the lack of modal shifts does provide some additional evidence of a direct, scientifically rigorous translation style on the part of Zulueta.

Category: Probability

Utterance A

ST: In Protohippus the lateral toes are so reduced that they do not reach the ground and are **probably** useless.

⁴For example, the first paragraph of the section titled *Fossils and their story* begins in the source text with "It has occasionally happened in various parts of the United States that men have un earthed bones of elephants (mastodon) and other animals that are not now native to this country," and goes on to briefly discuss the natural history of elephants and their ancestors. This paragraph is excluded from Zulueta's translation entirely.

TT: En Protohippus, los dedos laterales son tan reducidos que no llegan al suelo y **probablemente** no tenían uso;

Category: Possibility

Utterance B

ST: At any rate there appear to be but two **possible** theories...

TT: En todo caso, parece que no hay más que dos teorías **posibles**...

Utterance C

ST: The species thus tends to change, **possibly** in more ways than one, in the direction of better fitness for its environment.

TT: La especie tiende así a cambiar, **posiblemente** por más de un camino, en el sentido de una mayor adecuación al medio.

Utterance D

ST: Since we have seen that animals and plants are often greatly changed and new types produced by the methods used in breeding experiments, the idea suggests itself that similar modifications **may** take place in nature.

TT: Como hemos visto que los animales y plantas muchas veces cambian grandemente y que se producen nuevos tipos por los métodos usados en los experimentos de Genética, viene en seguida la idea que también en la naturaleza **pueden** tener lugar cambios semejantes.

Utterance E

ST: In some such way there **may have been** produced the swamp maple (*Acer rubrum*), the silver maple of the bottom lands and river banks (*A. saccharinum*), ...

TT: De un modo parecido a éste **pueden haberse** originado el arce de los terrenos pantanosos (*Acer rubrum*), el de las tierras de fondo húmedo y orillas de los ríos (*Acer saccharinum*)...

Utterance F

ST: Some of them were of such size that they **may have been** the most ponderous beings that ever walked the earth.

TT: algunos fueron de tal tamaño que **quizás hayan sido** los seres de mayor peso que han andado sobre la tierra

Utterance G

ST: There can be little doubt that natural selection is at work all the time, and that it produces results, although there **may be** other influences that are responsible for some of the results observed.

TT: Apenas podemos dudar de que la evolución está siempre en actividad y produce resultados, aun cuando **pueda haber** otras influencias a las que se

deban algunos de los efectos observados.

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