

Bilingual Interlingual Annotation: A Contrastive Analysis of English/Spanish

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1. Introduction

This paper describes an investigation into the degree of correspondence between the interlingual structures associated with translationally equivalent sentences in two versions of the ACCION International article, a Spanish text and its human-produced English translation. The task involves interlingual annotation of states, events, objects and—to a lesser degree—predicates and comparatives in a Spanish-English bilingual text. A contrastive analysis of the interlingual annotations for both languages is presented.

2. Preprocessing

A pre-processing step involved: (1) automatic tokenization of the English and Spanish texts, using UMD's tokenization system (e.g., 'del' → 'de el', '\$80' → '\$ 80', 'system.' → 'system .'); and (2) hand alignment of the sentences in each of the two texts. There were 37 sentences in the English text and 28 in the Spanish text; in order to produce an aligned set, sentences in each of the two texts were combined so each text totaled 28 sentences. This involved combining several of the English sentences so that they aligned appropriately with the Spanish ones, as shown here:

Spanish Sentence Number	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28
English Sentence Number(s)	1	2	3	4	5	6	7	8	9,10	11	12	13,14,15	16,17	18	19	20,21	22,23	24	25	26,27	28	29,30	31	32	33	34,35	36	37

3. Interlingual Annotation

The total number of unique concepts used to annotate the Spanish and English sentences is 304: (1) 158 unique concepts were used to annotate both the Spanish and English sentences; (2) 70 unique concepts were used only for English; (3) 76 unique concepts were used only for Spanish. These are summarized below.

158 Unique Concepts to annotate both the Spanish and English sentences:

Event	ASPIRE1 CONVERT DUB ACCESS1 ADJUST1 CHANGE-OF-STATE1 CODIRECT1 CONSIDER1 CONTRIBUTE1 CREATE1 DESIGN1 DISBURSE1 ENCOURAGE1 ESTABLISH1 EXPAND1 FINANCE1 FOLLOW1 FORECAST1 GRANT1 HAVE-ACCOUNT1 INCREASE1 INTEGRATE1 LEARN1 LEND1 MAINTAIN1 OFFER1 OPEN1 OPERATION1 PERMIT1 REACH1 RECUPERATE1 REGISTER1 REGULATE1 REQUIRE1 SPECIALIZE1 STRIVE1 TRAIN1 TRANSITION1
State	BEGIN1 CURRENT1 END-OF-5-YEARS1 END1-OF HAVE1 PREDICATIVE1
Predicate	INDIGENOUS1 INTERESTING1 NON-PROFIT LAST-OF-QUANTITY EACH-YEAR-OF YEAR-OF 2-YEAR-DURATION1-OF-EVENT 2-YEAR-WITHIN1-OF-EVENT 4-YEAR-DURATION1-OF-EVENT 5-YEAR-DURATION1-OF-EVENT 100-PERCENT-QUANTITY1-OF 13K-QUANTITY1 1B-QUANTITY1-OF 25-PERCENT-QUANTITY1-OF 273-QUANTITY1-OF 27M-QUANTITY1-OF 29-QUANTITY1-OF 2K-QUANTITY1 35-MILLION-QUANTITY1-OF 40-PERCENT-QUANTITY1-OF 4M-QUANTITY1-OF 600-QUANTITY1-OF 70000-QUANTITY1-OF 77-PERCENT-QUANTITY1-OF 80-MILLION-QUANTITY1-OF
Object	ACCESS1 ACTION-INTERNATIONAL1 AGENCY1 ARTICLE1 ASSET1 ASSOCIATION1 AVERAGE1 BANCO1 BANCOSOL1 BANK1 BOLIVIA1 BRANCH1 BUSINESS-CIRCLES1

	CALMEADOW1 CAPITAL1 CLIENT1 COMMERCIAL-BANK1 COMMUNITY-ACTION1 CONTEXT1 COUNTRY1 CREDIT1 CRITERION1 DEMAND1 DEPOSIT1 DOLLAR1 DOOR1 EIGHTEEN-QUANTITY1-OF ESTABLISHMENTS1 EXPERIENCE1 FUNDES1 GENESIS1 GROUP1 GUATEMALA1 ICC1 INDEPENDENT-ORGANIZATION1 INFORMATION1 INSTITUTION1 INTERAMERICAN-DEVELOPMENT-BANK1 INVESTMENT1 JOINT-BUSINESS1 K-REP1 KENYA1 LATIN-AMERICA1 LAW1 LOAN1 LOSS1 MARIA-OTERO1 MARKET1 MICROENTERPRISE1 MICROFINANCE1 NETWORK1 ORGANIZATION1 OTHERS1 PERCENTAGE1 PERSONNEL1 PERU1 PLAN1 POPULATION1 PORTFOLIO1 PRIVATE-BANK1 PRIVATE-ORGANIZATION1 PRODEM1 PROGRAM1 QUALITY1 RATE1 REASON1 REIMBURSEMENT1 SAVINGS1 SECTOR1 SERVICE1 SHARE1 SHAREHOLDER1 SIX-QUANTITY1-OF STRUCTURE1 STUDY1 SUCCESS1 SUPERINTENDENT1 TECHNICAL-ASSISTANCE1 THIRTEEN-QUANTITY1-OF THREE-QUANTITY1-OF TYPE1 UNITED-STATES1 VICE-PRESIDENT1 WOMAN1 YIELD1 NWOMF1
Comparison	LESS-THAN1 MORE-THAN1

70 Unique English Concepts not used in Spanish:

Event	CONTRIBUTE1 ADAPT1 BRING1 CHARTER1 CONTINUE1 CREATE1 FUND1 HELP1 INCLUDE1 INCREASE1 INVEST1 OPERATE1 REGULATE1 REMAIN1 REQUIRE1 RESHAPE1 SERVE1 SERVICE1 SPEAK1 TRANSFER1 WRITE1
State	CURRENT1 DESIRE1 MAKE1 NEED1 REALIZE1 USE1
Object	CAPITAL1 LOAN1 MARKET1 0-QUANTITY1-OF ACTION-INTERNATIONAL1 ADVANCED-INSTITUTION1 AVAILABILITY1 BANK1 COMMITMENT1 COVERAGE1 EMPLOYMENT-OPPORTUNITY1 FINANCIAL-SYSTEM1 INCOME1 INSTITUTION1 ISSUE1 JOINT-BUSINESS1 JOINT1 LEAD1 LEADERSHIP1 MANAGEMENT1 MEMBER1 METHODOLOGY1 MICROENTREPRENEUR1 MOBILIZATION1 NETWORK1 PORTFOLIO1 PROCESS1 PRODEM1 SELF-EMPLOYED1 SELF1 STORY1 SYSTEM1 TECHNIQUE1 TECHNOLOGY1 WORDS1 WORLD1
Predicate	BANKABLE1 PROFITABLE1 SMALL1 UNABLE1
Comparison	FIRST1 LOUDER-THAN1 MORE-THAN1

76 Unique Spanish Concepts not used in English:

Event	ADMINISTRATE1 ARRIVE1 BORN1 BUILD1 CONTROL1 COVER1 DISTRIBUTE1 EXPLOIT1 EXTEND-EVENT1 FAVOR1 GIVE1 GO1 INDEBT1 MENTION1 OBSERVE1 PRESENT1 RECOGNIZE RECOGNIZE1 REPRESENT1 SOME-DAY-OF1 SUPPLY1 TAKE1 X-RAY1-EVENT OFFER1 OWE1
State	COVERS1 KNOWLEDGE1
Object	500-QUANTITY1-OF ADMINISTRATION1 ASSISTANCE1 AUTHOR1 BALANCE1 BENEFICIARY1 BOLIVIAN1 CONCERN1 CONDITION1 DEGREE1 DIRECTOR1 DYNAMIC-NATURE1 EFFECT1 EMPLOYMENT1 ESTABLISHMENT1 EXAMPLE1 FEAT1 FORM1 GOAL1 HEADQUARTERS1 IDEA1 INDEPENDENT-WORKER1 INITIATIVE1 LESSON1 LEVEL1 MAJORITY1 MICROCREDIT1 NATIONAL-BANKING-SYSTEM1 OPERATION1 ORIGEN1 PERSPECTIVE1 POSSIBILITY1 PRECEDENT1 PUBLICATION1 REPRESENTATIVE1 RESPONSIBLE-ONE1 RESULTS1 RIGHT1 SHORT-TERM1 STRENGTH1 SUBSIDIARY-INSTITUTION1 SUM1 TERRAIN1 THEME1
Predicate	CONTAGIOUS1 EVIDENT1 INSOLVENT1 LOW1 PRIMARY1

4. English/Spanish texts

The ACCION International English text consists of 472 lines, one for each semantically relevant constituent (e.g., “Latin America,” “louder than,” “non-profit,” and “started”). A total of 279 lines in the English data have no matching annotation in the corresponding sentence in the Spanish data. Of the 472 lines, 347 were hand-annotated with their interlingual representations and 125 were left unlabeled.

The 86 (unique) words that comprise the unlabeled set consist primarily of function words and certain modifiers (adjectivals and adverbials): “-based,” “BY,” “Bank’s,” “It is,” “Its,” “One of the most,” “S.A.,” “She,” “The,” “The most important,” “a,” “about,” “and,” “and a,” “approximately,” “are,” “are also,” “as,” “as a,” “as well as,” “averaging,” “before,” “but,” “by,” “close,” “coupled,” “default,” “financial,” “financial institutions,” “for,” “for example,” “from,” “from Canada,” “had,” “have,” “in,” “in the,” “including,” “into,” “is,” “it,” “it was,” “it would,” “its,” “making,” “moved,” “never,” “of,” “of all,” “of the,” “of this,” “of which,” “of whom,” “only,” “only about,” “other financially strong,” “out of a,” “outstanding,” “people of,” “powerful,” “private,” “privated,” “required,” “small,” “some,” “successful,” “that,” “that despite,” “that while,” “the,” “the Bolivian,” “the first,” “the group,” “the very poor,” “thereby,” “this time,” “through,” “to,” “to their own,” “towards,” “very low income,” “which,” “while,” “with them,” and “working.”

The Spanish version of this text consists of 453 lines, one for each semantically relevant constituent (e.g., “América Latina,” “más de,” “sin fines de lucro,” and “comenzó”). A total of 260 lines in the Spanish data have no matching annotation in the corresponding sentence in the English data. Of the 453 lines, 356 were hand-annotated with their interlingual representations and 97 were left unlabeled.

The 56 (unique) words that comprise the unlabeled set consist primarily of function words and certain modifiers (adjectivals and adverbials): “En,” “Frente a,” “POR,” “a,” “a la de,” “al mismo tiempo,” “anteriormente,” “así,” “así como,” “cerca de,” “como,” “con,” “conjuntamente,” “de,” “de buena,” “de la,” “de los cuales,” “de todos,” “del,” “deseosos,” “e,” “en,” “en general,” “en la,” “en los,” “era preciso,” “específico,” “financieramente sanas,” “financieras,” “financieros,” “inicialmente,” “logístico,” “muy importante,” “más desfavorecidos,” “no fueron,” “para,” “perfectamente,” “pero,” “por,” “próxima,” “que,” “que aunque,” “que,” “se,” “sobre,” “sobre todo,” “social,” “son,” “tanto en,” “y,” and “éste solo.”

5. Comparison of interlingual annotations between Spanish/English sentence pairs.

Out of the 347 English and 356 Spanish hand-annotated lines, 193 lines have a matching annotation in the corresponding sentence in the other language (56% overlap in English, 54% in Spanish). The conceptual overlaps are given in Appendix A, sorted according to the number of the Spanish sentence. The remaining 154 English and 163 Spanish annotated lines had no match in the corresponding sentence in the other language; these are shown in Appendices B and C, respectively.

Some representative cases are discussed here.

5. 1 Sentence pairs with no matching annotations

In general, the pairs with no matching annotations are short sentences—often brief remarks or sub-headings that are not directly translatable; thus, no matching interlingual annotations were found across these pairs:

Sentence 8 (English): Solidarity groups

Sentence 8 (Spanish): Nacimiento del Banco Solidario (Birth of the Banco Solidario [Mutual Bank])

Sentence 25 (English): Small is profitable

Sentence 19 (Spanish): un éxito fulgurante (A success shining)

5. 2 Sentence pairs with minimal mismatch

In some cases, there were few mismatches between interlingual annotations of corresponding sentence pairs:

Sentences 22,23 (English): BancoSol opened its doors in 1992; PRODEM transferred to BancoSol its \$ 4 million portfolio in exchange for shares, making PRODEM the largest shareholder of this newly formed bank.

Sentence 17 (Spanish): BancoSol abrió sus puertas en 1992, con prodem como principal accionista , que había convertido sus cuatro millones de dólares de capital en acciones.

Gloss: BancoSol opened its doors in 1992 with PRODEM as principal shareholder which had converted its four millions of dollars of into shares.

The interlingual annotations for the English and Spanish cases above are shown here (with mismatched portions bold-faced):

BancoSol / BANCOSOL1-OBJECT
opened / OPEN1-EVENT(BANCOSOL1,DOOR1)
its doors / DOOR1-OBJECT
in 1992. / YEAR-OF(OPEN1,1992)
PRODEM / PRODEM1-OBJECT
transferred / **TRANSFER1-EVENT(PRODEM1,DOLLAR1,BANCOSOL1)**
to BancoSol / BANCOSOL1-OBJECT
its
\$ / DOLLAR1-OBJECT
4 million / 4M-QUANTITY1-OF-OBJECT(DOLLAR1)
portfolio / **PORTFOLIO1-OBJECT**
in exchange for / CONVERT(PRODEM1,DOLLAR1,SHARE1)
shares, / SHARE1-OBJECT
making
PRODEM / PRODEM1-OBJECT
the largest shareholder / SHAREHOLDER1-OBJECT
of this
newly formed bank. / **BANK1-OBJECT**

BancoSol / BANCOSOL1-OBJECT
abrió / OPEN1-EVENT(BANCOSOL1,DOOR1)
sus puertas / DOOR1-OBJECT
en 1992 / YEAR-OF(OPEN1,1992)
con
PRODEM / PRODEM1-OBJECT
como principal accionista, / SHAREHOLDER1-OBJECT
que había convertido / CONVERT(PRODEM1,DOLLAR1,SHARE1)
sus cuatro millones / 4M-QUANTITY1-OF-OBJECT(DOLLAR1)
de dólares / DOLLAR1-OBJECT
de capital / **CAPITAL1-OBJECT**
en acciones. / SHARE1-OBJECT

The primary distinction above is that the “transfer” event in English is not required in Spanish, due to the more concise nature of the Spanish sentence (see the gloss above). The “transfer” event is, in a sense, subsumed by the “convert” event which also covers the notion of converting dollars into shares. Most of the other major components of both sentences are matched, even though they appear in a different order.

5.3 Highly mismatched cases:

Unfortunately, there are several cases (over 50% of the sentence pairs) where the degree to which the interlingual annotations do not match is extremely high. Sentence 6 (in both English and Spanish) is the best example:

Three of the most advanced institutions in the ACCION network started their programmes as non-profit organizations and have, in the last five years, converted into regulated financial institutions that are part of the financial system in their countries but specialize in serving the microenterprise sector.

Tres de las instituciones dependientes de acción internacional que han dado mejores resultados, que inicialmente eran organizaciones sin fines de lucro, se han transformado, en los últimos cinco años en establecimientos de crédito perfectamente integrados en el sistema bancario nacional pero especializados en el sector de la microempresa.

Gloss: Three of the institutions dependent of ACCION International which have given best results which initially were organizations non-profit themselves have transformed in the last five years in businesses of credit completely integrated into the system banking national but specialized in the sector of the microenterprise.

The interlingual annotations for the English and Spanish cases above are shown here (with mismatched portions bold-faced):

Three / **THREE-QUANTITY1-OF-OBJECT(ADVANCED-INSTITUTION1)**
of
the most advanced institutions / **ADVANCED-INSTITUTION1-OBJECT**
in
the ACCION / **ACTION-INTERNATIONAL1-OBJECT**
network / **NETWORK1-OBJECT**
started / **BEGIN1-STATE(PROGRAM1)**
their programmes/ **PROGRAM1-OBJECT**
as
non-profit / **ASSOCIATION1-OBJECT**
organizations / **NON-PROFIT(ASSOCIATION1)**
and
have,
in the last / **LAST-OF-QUANTITY(5-YEAR-DURATION1)**
five years / **5-YEAR-DURATION1-OF-EVENT(CHANGE-OF-STATE1)**
converted / **CHANGE-OF-STATE1-EVENT(ADVANCED-INSTITUTION1,INSTITUTION1)**
into
regulated / **REGULATE1-EVENT(agent,INSTITUTION1,proposition)**
financial
institutions / **INSTITUTION1-OBJECT**
that
are
part of / **INTEGRATE1-EVENT(INSTITUTION1,FINANCIAL-SYSTEM1)**
the financial system / **FINANCIAL-SYSTEM1-OBJECT**
in their countries / **COUNTRY1-OBJECT**
but
specialize / **SPECIALIZE1-EVENT(FINANCIAL-SYSTEM1,SERVE1)**
in serving / **SERVE1-EVENT(FINANCIAL-SYSTEM1,MICROENTERPRISE1)**
the
microenterprise / **MICROENTERPRISE1-OBJECT**
sector / **SECTOR1-OBJECT**

Tres / **THREE-QUANTITY1-OF-OBJECT(SUBSIDIARY-INSTITUTION1)**
de
las instituciones dependientes / **SUBSIDIARY-INSTITUTION1-OBJECT**
de
ACCIÓN Internacional / **ACTION-INTERNATIONAL1-OBJECT**
que
han dado / **GIVE1-EVENT(ACTION-INTERNATIONAL1,RESULTS1)**
mejores resultados / **RESULTS1-OBJECT**
que
inicialmente
eran / **PREDICATIVE1-STATE(SUBSIDIARY-INSTITUTION1,ORGANIZATION1)**
organizaciones / **ORGANIZATION1-OBJECT**
sin fines de lucro / **NON-PROFIT(ORGANIZATION1)**
se han transformado / **CHANGE-OF-STATE1-EVENT(SUBSIDIARY-INSTITUTION1,ESTABLISHMENT1)**
en los
últimos / **LAST-OF-QUANTITY(5-YEAR-DURATION1)**
cinco años / **5-YEAR-DURATION1-OF-EVENT(CHANGE-OF-STATE1)**
en
establecimientos / **ESTABLISHMENT1-OBJECT**
de
crédito / **CREDIT1-OBJECT**
perfectamente
integrados / **INTEGRATE1-EVENT(ESTABLISHMENT1,NATIONAL-BANKING-SYSTEM1)**
en
el sistema bancario nacional / **NATIONAL-BANKING-SYSTEM1-OBJECT**
pero
especializados / **SPECIALIZE1-EVENT(NATIONAL-BANKING-SYSTEM1,MICROENTERPRISE1)**
en
el sector / **SECTOR1-OBJECT**
de la microempresa / **MICROENTERPRISE1-OBJECT**

Although there are only 5 matches (out of 20 in English and 18 in Spanish), what mitigates the degree of mismatch is that certain *parts* of the mismatched annotations are identical. For example, the predicate **THREE-QUANTITY1-OF-OBJECT** appears in both the English and Spanish. Moreover, the argument of this predicate might be aligned across the two languages if one were to use a matching mechanism that could detect “type-of” relations.

6 Conclusion

This exercise indicates that, in only a short amount of time, it is possible to devise interlingual representations that overlap more than 50% of the time in a human-annotated bilingual corpus. This suggests that it might be possible to achieve a relatively high degree of overlap with a more in-depth (i.e., less time-constrained) investigation. On the other hand, there are still issues to be resolved. First, the representations were designed by a single speaker of English, with no inter-annotator cross-checking; thus, it’s likely that it will be harder to achieve a high degree of overlap with a joint effort among several different annotators. Second, the 50% overlap is fairly evenly distributed—there is no single sentence pair that overlaps entirely with respect to the interlingual representation (with the exception of the very simple sentence fragment that attributes the article to the author: “by Maria Otero.” Third, this investigation includes an annotation and analysis of only a portion of the language, primarily verbs and nouns, ignoring prepositions and treating adjectives and adverbials scantily. Finally, the level of semantic annotation is not deep enough to include more complex notations such as co-reference and temporal/aspectual knowledge.

Appendix A: 193 Matching Annotations for 28 Bilingually Aligned Sentence Pairs

1	/LATIN-AMERICA1-OBJECT
2	/MARIA-OTERO1-OBJECT
3	/BANCOSOL1-OBJECT /COMMERCIAL-BANK1-OBJECT
4	/ACTION-INTERNATIONAL1-OBJECT /COUNTRY1-OBJECT /ESTABLISHMENTS1-OBJECT /LATIN-AMERICA1-OBJECT /NETWORK1-OBJECT /NON-PROFIT(PRIVATE-ORGANIZATION1) /OFFER1-EVENT(PRIVATE-ORGANIZATION1,TECHNICAL-ASSISTANCE1,NETWORK1-OBJECT) /PREDICATIVE1-STATE(ACTION-INTERNATIONAL1,PRIVATE-ORGANIZATION1) /PRIVATE-ORGANIZATION1-OBJECT /SIX-QUANTITY1-OF-OBJECT(COUNTRY1) /TECHNICAL-ASSISTANCE1-OBJECT /THIRTEEN-QUANTITY1-OF-OBJECT(COUNTRY1) /UNITED-STATES1-OBJECT
5	/1B-QUANTITY1-OF-OBJECT(DOLLAR1) /5-YEAR-DURATION1-OF-EVENT(DISBURSE1) /AVERAGE1-OBJECT /DOLLAR1-OBJECT /EIGHTEEN-QUANTITY1-OF-OBJECT(INDEPENDENT-ORGANIZATION1) /INDEPENDENT-ORGANIZATION1-OBJECT /LAST-OF-QUANTITY(5-YEAR-DURATION1) /LATIN-AMERICA1-OBJECT /LESS-THAN1-COMPARISON(LOAN1,500-QUANTITY1) /LOAN1-OBJECT /NETWORK1-OBJECT
6	/5-YEAR-DURATION1-OF-EVENT(CHANGE-OF-STATE1) /ACTION-INTERNATIONAL1-OBJECT /LAST-OF-QUANTITY(5-YEAR-DURATION1) /MICROENTERPRISE1-OBJECT /SECTOR1-OBJECT
7	/BANCOSOL1-OBJECT /BOLIVIA1-OBJECT
8	—
9	/ACTION-INTERNATIONAL1-OBJECT /BANCOSOL1-OBJECT /BUSINESS-CIRCLES1-OBJECT /CAPITAL1-OBJECT
10	/CREDIT1-OBJECT /DUB(agent,PROGRAM1,PRODEM1) /INCREASE1-EVENT(agent,YIELD1) /INVESTMENT1-OBJECT /MICROENTERPRISE1-OBJECT /PRODEM1-OBJECT /PROGRAM1-OBJECT /SECTOR1-OBJECT /TRAIN1-EVENT(agent,theme)
11	/JOINT-BUSINESS1-OBJECT /PRODEM1-OBJECT
12	/13K-QUANTITY1-OBJECT(DIRECTOR1) /273-QUANTITY1-OF-OBJECT(DOLLAR1) /27M-QUANTITY1-OF-OBJECT(DOLLAR1) /2K-QUANTITY1-OBJECT(DOLLAR1) /AVERAGE1-OBJECT /DOLLAR1-OBJECT /LOAN1-OBJECT /MORE-THAN1-COMPARISON(DOLLAR1,13K-QUANTITY1) /MORE-THAN1-COMPARISON(DOLLAR1,27M-QUANTITY1) /RATE1-OBJECT /WOMAN1-OBJECT
13	/INFORMATION1-OBJECT /PERSONNEL1-OBJECT /QUALITY1-OBJECT /REASON1-OBJECT /SUCCESS1-OBJECT /TRAIN1-EVENT(agent,PERSONNEL1)
14	/4M-QUANTITY1-OF-OBJECT(DOLLAR1) /DOLLAR1-OBJECT /END1-OF-STATE(1991) /PERCENTAGE1-OBJECT /PORTFOLIO1-OBJECT /PRODEM1-OBJECT
15	/ACCESS1-EVENT(CLIENT1,MARKET1) /CLIENT1-OBJECT /DEMAND1-OBJECT /MICROFINANCE1-OBJECT /PLAN1-OBJECT /PRIVATE-BANK1-OBJECT /PRODEM1-OBJECT /SAVINGS1-OBJECT /SPECIALIZE1-EVENT(PRIVATE-BANK1,MICROFINANCE1)
16	/2-YEAR-DURATION1-OF-EVENT(TRANSITION1) /BANCO1-OBJECT /BEGIN1-STATE(TRANSITION1) /BOLIVIA1-OBJECT /CAPITAL1-OBJECT /CRITERION1-OBJECT /DESIGN1-EVENT(agent,STRUCTURE1) /ESTABLISH1-EVENT(agent,CAPITAL1) /FORECAST1-EVENT(agent,YIELD1) /LAW1-OBJECT /PERSONNEL1-OBJECT /REQUIRE1-EVENT(LAW1,CAPITAL1) /STRUCTURE1-OBJECT /SUPERINTENDENT1-OBJECT /TRAIN1-EVENT(agent,PERSONNEL1) /TRANSITION1-EVENT(PRODEM1) /YEAR-OF(TRANSITION1,1989) /YIELD1-OBJECT
17	/4M-QUANTITY1-OF-OBJECT(DOLLAR1) /BANCOSOL1-OBJECT /CONVERT(PRODEM1,DOLLAR1,SHARE1) /DOLLAR1-OBJECT /DOOR1-OBJECT /OPEN1-EVENT(BANCOSOL1,DOOR1) /PRODEM1-OBJECT /SHARE1-OBJECT /SHAREHOLDER1-OBJECT /YEAR-OF(OPEN1,1992)
18	/ACTION-INTERNATIONAL1-OBJECT /BANK1-OBJECT /BRANCH1-OBJECT /CALMEADOW1-OBJECT /CONTRIBUTE1-EVENT(ACTION-INTERNATIONAL1,CREATE1) /CREATE1-EVENT(agent,BANK1) /FUNDES1-OBJECT /ICC1-OBJECT /INTERAMERICAN-DEVELOPMENT-BANK1-OBJECT /OTHERS1-OBJECT /PREDICATIVE1-STATE(SHAREHOLDER1,ACTION-INTERNATIONAL1) /SHAREHOLDER1-

	OBJECT
19	—
20	/29-QUANTITY1-OF-OBJECT(AGENCY1) /4-YEAR-DURATION1-OF-EVENT(OPERATION1) /40-PERCENT-QUANTITY1-OF-OBJECT(CLIENT1) /70000-QUANTITY1-OF-OBJECT(CLIENT1) /AGENCY1-OBJECT /BANCOSOL1-OBJECT /CLIENT1-OBJECT /HAVE-ACCOUNT1-EVENT(BANCOSOL1,AGENCY1) /OPERATION1-EVENT
21	/ASSET1-OBJECT /BANCOSOL1-OBJECT /BANK1-OBJECT /CLIENT1-OBJECT /INDIGENOUS1-PREDICATE /LOSS1-OBJECT /OTHERS1-OBJECT /PREDICATE1-STATE(LOSS1,LOW1) /RATE1-OBJECT /REGISTER1-EVENT(BANCOSOL1,RATE1) /WOMAN1-OBJECT /YEAR-OF(REGISTER1,1994)
22	/25-PERCENT-QUANTITY1-OF-OBJECT(DOLLAR1) /35-MILLION-QUANTITY1-OF-OBJECT(DOLLAR1) /600-QUANTITY1-OF-OBJECT(DOLLAR1) /80-MILLION-QUANTITY1-OF-OBJECT(DOLLAR1) /BANCOSOL1-OBJECT /CURRENT1-STATE(BANCOSOL1) /DEPOSIT1-OBJECT /DOLLAR1-OBJECT /LEND1-EVENT(BANCOSOL1,PORTFOLIO1) /PORTFOLIO1-OBJECT /SAVINGS1-OBJECT
23	/ACCESS1-OBJECT /BANK1-OBJECT /POPULATION1-OBJECT /PREDICATE1-STATE(POPULATION1,ACCESS1) /SAVINGS1-OBJECT /SERVICE1-OBJECT
24	/BANCOSOL1-OBJECT
25	/BANK1-OBJECT /CREATE1-EVENT(SUPERINTENDENT1,TYPE1) /INSTITUTION1-OBJECT /ORGANIZATION1-OBJECT /PERMIT1-EVENT(INSTITUTION1,RECOGNIZE1) /REGULATE1-EVENT(agent,INSTITUTION1,PERMIT1) /SECTOR1-OBJECT /SUPERINTENDENT1-OBJECT /TYPE1-OBJECT /YEAR-OF(REGISTER1,1994)
26	/2-YEAR-WITHIN1-OF-EVENT(CHANGE-OF-STATE1) /ASPIRE1(c[K-REP1,COMMUNITY-ACTION1,GENESIS1],CHANGE-OF-STATE1) /BANCOSOL1-OBJECT /COMMUNITY-ACTION1-OBJECT /CONTEXT1-OBJECT /COUNTRY1-OBJECT /EXPERIENCE1-OBJECT /GENESIS1-OBJECT /GUATEMALA1-OBJECT /K-REP1-OBJECT /KENYA1-OBJECT /MICROFINANCE1-OBJECT /PERU1-OBJECT
27	/ACTION-INTERNATIONAL1-OBJECT /MARIA-OTERO1-OBJECT /PREDICATE1-STATE(MARIA-OTERO1,VICE-PRESIDENT1) /UNITED-STATES1-OBJECT /VICE-PRESIDENT1-OBJECT
28	/ARTICLE1-OBJECT /CODIRECT1-EVENT(MARIA-OTERO1,PUBLICATION1) /NWOMF-OBJECT1 /STUDY1-OBJECT

Appendix B: 154 Unmatched English Annotations:

1	/ACTION-INTERNATIONAL1-OBJECT /LOUDER-THAN1-COMPARISON(SPEAK,WORDS1) /SPEAK1-EVENT(ACTION-INTERNATIONAL1) /WORDS1-OBJECT
2	—
3	/FIRST1-COMPARISON(COMMERCIAL-BANK1-OBJECT) /MICROENTREPRENEUR1-OBJECT /STORY1-OBJECT
4	—
5	/LEND1-EVENT(INDEPENDENT-ORGANIZATION1,DOLLAR1) /MICROENTERPRISE1-OBJECT /MORE-THAN1-COMPARISON(DOLLAR1,1B-QUANTITY1)
6	/ADVANCED-INSTITUTION1-OBJECT /ASSOCIATION1-OBJECT /BEGIN1-STATE(PROGRAM1) /CHANGE-OF-STATE1-EVENT(ADVANCED-INSTITUTION1,INSTITUTION1) /COUNTRY1-OBJECT /FINANCIAL-SYSTEM1-OBJECT /INSTITUTION1-OBJECT /INTEGRATE1-EVENT(INSTITUTION1,FINANCIAL-SYSTEM1) /NETWORK1-OBJECT /NON-PROFIT(ASSOCIATION1) /PROGRAM1-OBJECT /REGULATE1-EVENT(agent,INSTITUTION1,proposition) /SERVE1-EVENT(FINANCIAL-SYSTEM1,MICROENTERPRISE1) /SPECIALIZE1-EVENT(FINANCIAL-SYSTEM1,SERVE1) /THREE-QUANTITY1-OF-OBJECT(ADVANCED-INSTITUTION1)
7	/INSTITUTION1-OBJECT
8	/GROUP1-OBJECT /JOINT1-OBJECT
9	/BRING1-EVENT(ACTION-INTERNATIONAL1,LEADERSHIP1) /CHANGE-OF-STATE1-EVENT(BANCOSOL1) /CREATE1-EVENT(MEMBER1,JOINT-BUSINESS1) /JOINT-BUSINESS1-OBJECT

	/LEADERSHIP1-OBJECT /MEMBER1-OBJECT /METHODOLOGY1-OBJECT /NON-PROFIT(JOINT-BUSINESS1) /OFFER1-EVENT(BUSINESS-CIRCLES1,c[TECHNOLOGY1,METHODOLOGY1]) /TECHNOLOGY1-OBJECT /YEAR-OF(CREATE1,1986)
10	/CREATE1-EVENT(SECTOR1,INCOME1) /EMPLOYMENT-OPPORTUNITY1-OBJECT /ENCOURAGE1-EVENT(agent,INVESTMENTS1) /EXPAND1-EVENT(agent,EMPLOYMENT-OPPORTUNITY1) /INCOME1-OBJECT /OFFER1-EVENT(PRODEM1-OBJECT,CREDIT1-OBJECT) /SELF-EMPLOYED1-OBJECT
11	/BEGIN1-STATE(MAKE1) /LEND1-EVENT(PRODEM1,theme) /LOAN1-OBJECT /MAKE1-STATE(LOAN1) /TECHNIQUE1-OBJECT /USE1-STATE(PRODEM1,TECHNIQUE1)
12	/0-QUANTITY1-OF-OBJECT /5-YEAR-DURATION1-OF-EVENT(OPERATE1) /5-YEAR-DURATION1-OF-EVENT(REMAIN1) /77-PERCENT-QUANTITY1-OF-OBJECT(MICROENTREPRENEUR1) /DISBURSE1-EVENT(PRODEM1,LOAN1,MICROENTREPRENEUR1) /END-OF-5-YEARS1-STATE(PRODEM1) /GRANT1-EVENT(PRODEM1,LOAN1,MICROENTREPRENEUR1) /LEND1-EVENT(PRODEM1,DOLLAR1) /MICROENTREPRENEUR1-OBJECT /OPERATE1-EVENT(PRODEM1) /PREDICATIVE1-STATE(MICROENTREPRENEUR1,WOMAN1) /PREDICATIVE1-STATE(PRODEM1,UNABLE1) /PRODEM1-OBJECT /RECUPERATE1-EVENT(PRODEM1,DOLLAR1-OBJECT) /REMAIN1-EVENT(RATE1,0-QUANTITY1) /UNABLE1-PREDICATE
13	/100-PERCENT-QUANTITY1-OF-OBJECT(REIMBURSEMENT1) /COMMITMENT1-OBJECT /CONTRIBUTE1-EVEN(REASON1,SUCCESS1) /INVEST1-EVENT(agent,TRAIN1) /MANAGEMENT1-OBJECT /ORGANIZATION1-OBJECT /PREDICATIVE1-STATE(REASON1,COMMITMENT1) /PRODEM1-OBJECT /REIMBURSEMENT1-OBJECT /SYSTEM1-OBJECT
14	/HAVE1-STATE(PRODEM1,PORTFOLIO1) /MARKET1-OBJECT /NEED1-STATE(MARKET1,SERVICE1) /REACH1-EVENT(PRODEM1,PERCENTAGE1) /REALIZE1-STATE(PRODEM1,REACH1) /SERVICE1-OBJECT /SUCCESS1-OBJECT
15	/CAPITAL1 /CHANGE-OF-STATE1-EVENT(INSTITUTION1,COMMERCIAL-BANK1) /CHARTER1-EVENT(agent,BANK1) /DESIRE1-STATE(PRODEM1,OFFER1) /FINANCE1-EVENT(agent,theme) /INSTITUTION1-OBJECT /LEADERSHIP1-OBJECT /MARKET1 /NON-PROFIT(INSTITUTION1) /OFFER1-EVENT(PRODEM1,PLAN1,CLIENT1) /WORLD1-OBJECT
16	/ADJUST1-EVENT(agent,CRITERION1) /BANK1-OBJECT /CHARTER1-EVENT(LAW1,BANK1) /INCLUDE1-EVENT(PROCESS1,ESTABLISH1) /PROCESS1-OBJECT
17	/BANK1-OBJECT /PORTFOLIO1-OBJECT /TRANSFER1-EVENT(PRODEM1,DOLLAR1,BANCOSOL1)
18	—
19	/PREDICATIVE1-STATE(SMALL1,PROFITABLE1) /PROFITABLE1-PREDICATE /SMALL1-PREDICATE
20	/BOLIVIA1-OBJECT /CURRENT1-STATE(HAVE-ACCOUNT1) /PREDICATIVE1-STATE(CLIENT1,40-PERCENT-QUANTITY1) /SYSTEM1-OBJECT
21	/BANKABLE1-PREDICATE /BOLIVIA1-OBJECT /CONSIDER1-EVENT(agent,CLIENT1,BANKABLE1) /INTERESTING1-PREDICATE(CONSIDER1) /LOAN1-OBJECT /REQUIRE1-EVENT(WOMAN1,LOAN1) /SYSTEM1-OBJECT
22	/EACH-YEAR-OF(LEND1) /FUND1-EVENT(agent,DOLLAR1) /LESS-THAN1-COMPARISON(LOAN1,600-QUANTITY1) /LOAN1 /PREDICATE1-STATE(PORTFOLIO1,DOLLAR1)
23	/BOLIVIA1-OBJECT /CONTINUE1-EVENT(BANK1,EXPAND1) /COVERAGE1-OBJECT /EXPAND1-EVENT(BANK1,COVERAGE1) /INCREASE1-EVENT(BANK1,MOBILIZATION1) /MAINTAIN1-EVENT(agent,SELF1,BANK1) /MOBILIZATION1-OBJECT /SELF1-OBJECT /SERVICE1-EVENT(BANK1,POPULATION1) /STRIVE1-EVENT(BANK1,CONTINUE1)
24	/BOLIVIA1-OBJECT /HELP1-EVENT(SUCCESS1,RESHAPE1) /RESHAPE1-EVENT(SUCCESS1,SYSTEM1) /SUCCESS1-OBJECT /SYSTEM1-OBJECT
25	/AVAILABILITY1-OBJECT /EXPAND1-EVENT(agent,AVAILABILITY1) /NON-PROFIT(INSTITUTION1) /REGULATE1-EVENT(agent,ORGANIZATION1,proposition) /SERVICE1-OBJECT
26	/ADAPT1-EVENT(INSTITUTION1,EXPERIENCE1,SETTING1) /CHANGE-OF-STATE1-EVENT(c[K-REP1,COMMUNITY-ACTION1,GENESIS1],INSTITUTION1) /FOLLOW1-EVENT(c[K-REP1,COMMUNITY-ACTION1,GENESIS1],LEAD1) /INSTITUTION1-OBJECT /LEAD1-OBJECT /LEARN1-EVENT(INSTITUTION1,EXPERIENCE1) /REGULATE1-EVENT(agent,INSTITUTION1,proposition)

	/SPECIALIZE1-EVENT(PRIVATE-BANK1,MICROFINANCE1)
27	—
28	/ISSUE1-OBJECT /MICROENTERPRISE1-OBJECT /WRITE1-EVENT(MARIA-OTERO1,STUDY1)

Appendix C: 163 Unmatched Spanish Annotations:

1	/FEAT1-OBJECT /X-RAY1-EVENT(agent,FEAT1)
2	—
3	/5-YEAR-DURATION1-OF-EVENT(CHANGE-OF-STATE1) /CHANGE-OF-STATE1-EVENT(BANCOSOL,COMMERCIAL-BANK1) /SPECIALIZE1-EVENT(COMMERCIAL-BANK1,MICROFINANCE1)
4	/HEADQUARTERS1-OBJECT /MICROCREDIT1-OBJECT
5	/500-QUANTITY1-OF-OBJECT(DOLLAR1) /COVERS1-STATE(NETWORK1,INDEPENDENT-ORGANIZATION1) /DISBURSE1-EVENT(INDEPENDENT-ORGANIZATION1,DOLLAR1) /DOLLAR1-OBJECT /FORM1-OBJECT
6	/CHANGE-OF-STATE1-EVENT(SUBSIDIARY-INSTITUTION1,ESTABLISHMENT1) /CREDIT1-OBJECT /ESTABLISHMENT1-OBJECT /GIVE1-EVENT(ACTION-INTERNATIONAL1,RESULTS1) /INTEGRATE1-EVENT(ESTABLISHMENT1,NATIONAL-BANKING-SYSTEM1) /NATIONAL-BANKING-SYSTEM1-OBJECT /NON-PROFIT(ORGANIZATION1) /ORGANIZATION1-OBJECT /PREDICATIVE1-STATE(SUBSIDIARY-INSTITUTION1,ORGANIZATION1) /RESULTS1-OBJECT /SPECIALIZE1-EVENT(NATIONAL-BANKING-SYSTEM1,MICROENTERPRISE1) /SUBSIDIARY-INSTITUTION1-OBJECT /THREE-QUANTITY1-OF-OBJECT(SUBSIDIARY-INSTITUTION1)
7	/CONSIDER1-EVENT(agent,EXAMPLE1) /EXAMPLE1-OBJECT
8	/BANCOSOL1-OBJECT /BORN1-EVENT(BANCOSOL1)
9	/ADMINISTRATE1-EVENT(c[ACTION-INTERNATIONAL1,REPRESENTATIVES1],ASSOCIATION1) /ADMINISTRATION1-OBJECT /ASSISTANCE1-OBJECT /ASSOCIATION1-OBJECT /BEGIN1-STATE(BANCOSOL1) /CONTROL1-EVENT(ACTION-INTERNATIONAL1,ADMINISTRATION1) /DISTRIBUTE1-EVENT(CAPITAL1,goal) /KNOWLEDGE1-STATE(agent,TERRAIN1) /NON-PROFIT(ASSOCIATION1) /PREDICATIVE1-STATE(BANCOSOL1,ASSOCIATION1) /REPRESENTATIVE1-OBJECT /SUPPLY1-EVENT(BUSINESS-CIRCLES1,ASSISTANCE1) /TERRAIN1-OBJECT /YEAR-OF(PREDICATIVE1,1986)
10	/EMPLOYMENT1-OBJECT /ENCOURAGE1-EVENT(agent,INVESTMENT1) /EXPAND1-EVENT(agent,PERSPECTIVE1) /GOAL1-OBJECT /INDEPENDENT-WORKER1-OBJECT /OFFER1-EVENT(agent,INDEPENDENT-WORKER1,POSSIBILITY1) /PERSPECTIVE1-OBJECT /POSSIBILITY1-OBJECT /PREDICATIVE1-STATE(GOAL1,OFFER1) /YIELD1-OBJECT
11	/BEGIN1-STATE(LEND1) /CAPITAL1-OBJECT /EXPLOIT1-EVENT(CAPITAL1,GROUPS1) /GROUP1-OBJECT /IDEA1-OBJECT /LEND1-EVENT(PRODEM1,SUM1) /SUM1-OBJECT
12	/100-PERCENT-QUANTITY1-OF-OBJECT(REIMBURSEMENT1) /77-PERCENT-QUANTITY1-OF-OBJECT(DIRECTOR1) /DIRECTOR1-OBJECT /END-OF-5-YEARS1-STATE(PROGRAM1) /GRANT1-EVENT(PROGRAM1,LOAN1,DIRECTOR1) /PREDICATIVE1-STATE(DIRECTOR1,WOMAN1) /PROGRAM1-OBJECT /RECUPERATE1-EVENT(agent,DOLLAR1-OBJECT) /REIMBURSEMENT1-OBJECT
13	/ADMINISTRATION1-OBJECT /CONCERN1-OBJECT /LEVEL1-OBJECT /MENTION1-EVENT(agent,CONCERN1) /OFFER1-EVENT(agent,SERVICE1) /SERVICE1-OBJECT /STRENGTH1-OBJECT
14	/BENEFICIARY1-OBJECT /DYNAMIC-NATURE1-OBJECT /EVIDENT1-PREDICATE /FAVOR1-EVENT(PROGRAM1,BENEFICIARY1) /LOAN1-OBJECT /OWE(PORTFOLIO1,DYNAMIC-NATURE1) /PREDICATIVE1-STATE(FAVOR1,EVIDENT1) /PROGRAM1-OBJECT /REPRESENT1-EVENT(LOAN1,DOLLAR1)
15	/ASSOCIATION1-OBJECT /CAPITAL1-OBJECT /CONDITION1-OBJECT /CREDIT1-OBJECT /DEPOSIT1-OBJECT /FINANCE1-EVENT(RESPONSIBLE-ONE1,OPERATION1) /GO1-EVENT(RESPONSIBLE-ONE1,CONDITION1) /HAVE1-STATE(RESPONSIBLE-ONE1,ACCESS1) /INITIATIVE1-OBJECT /MARKET1-OBJECT /NON-PROFIT(ASSOCIATION1) /OFFER1(RESPONSIBLE-ONE1,PLAN1,CLIENT1)

	/OPERATION1-OBJECT /PRECEDENT1-OBJECT /RESPONSIBLE-ONE1-OBJECT /TAKE1-EVENT(RESPONSIBLE-ONE1,INITIATIVE1)
16	/ADJUST1-EVENT(agent,CRITERION1-OBJECT) /BOLIVIAN1-OBJECT /EFFECT1-OBJECT
17	/CAPITAL1-OBJECT
18	/DEGREE1-OBJECT
19	/SUCCESS1-OBJECT
20	/COUNTRY1-OBJECT
21	/CONSIDER1-EVENT(agent,CLIENT1,INSOLVENT1) /COUNTRY1-OBJECT /ESTABLISHMENT1-OBJECT /INDEBT1-EVENT(WOMAN1-OBJECT,SUM1-OBJECT) /INSOLVENT1-PREDICATE /INTERESTING1-PREDICATE(OBSERVE1) /LOW1-PREDICATE /OBSERVE1-EVENT(agent,CONSIDER1) /PRIMARY1-PREDICATE /SUM1-OBJECT /YIELD1-OBJECT
22	/EACH-YEAR-OF(REACH1) /GRANT1-EVENT(agent,LOAN1) /LESS-THAN1-COMPARISON(SUM1,600-QUANTITY1) /LOAN1-OBJECT /REACH1-EVENT /SHORT-TERM1-OBJECT /SUM1-OBJECT
23	/ARRIVE1-EVENT(BANK1,COVER1) /BALANCE1-OBJECT /BUILD1-EVENT(BANK1,SAVINGS1) /COUNTRY1-OBJECT /COVER1-EVENT(BANK1,MAJORITY1) /MAINTAIN1-EVENT(BANK1,SERVICE1) /MAJORITY1-OBJECT /PRESENT1-EVENT(BANK1,BALANCE1) /SOME-DAY-OF1-EVENT(STRIVE1) /STRIVE1-EVENT(BANK1,ARRIVE1)
24	/CONTAGIOUS1-PREDICATE /EXAMPLE1-OBJECT /OTHERS1-OBJECT /PREDICATE1-STATE(EXAMPLE1,CONTAGIOUS1)
25	/ASSISTANCE1-OBJECT /EXTEND-EVENT1(ORGANIZATION1,OPERATION1) /MICROENTERPRISE1-OBJECT /OPERATION1-OBJECT /RECOGNIZE1-EVENT(agent,ASSISTANCE1,BANK1) /RIGHT1-OBJECT
26	/CHANGE-OF-STATE1-EVENT(c[K-REP1,COMMUNITY-ACTION1,GENESIS1],ESTABLISHMENT1) /ENCOURAGE1-EVENT(agent,c[K-REP1,COMMUNITY-ACTION1,GENESIS1],FOLLOW1) /ESTABLISHMENT1-OBJECT /FOLLOW1-EVENT(c[K-REP1,COMMUNITY-ACTION1,GENESIS1],LESSON1) /LEARN1-EVENT(BANCOSOL1-OBJECT,LESSON1) /LESSON1-OBJECT /ORGANIZATION1-OBJECT /RECOGNIZE-EVENT(agent,ESTABLISHMENT1,SPECIALIZE1) /SPECIALIZE1-EVENT(ESTABLISHMENT1,MICROFINANCE1)
27	/ASSOCIATION1-OBJECT /BOLIVIA1-OBJECT /ORIGEN1-OBJECT
28	/AUTHOR1-OBJECT /PUBLICATION1-OBJECT /THEME1-OBJECT /YEAR-OF(CODIRECT1,1994)