

MT POST-EDITING: A TEXT REPAIR EXPERIENCE FOR THE FOREIGN LANGUAGE CLASS

Ana Niño

University of Manchester

A.Nino@postgrad.manchester.ac.uk

Abstract: Communication also means having to sort out the problems involved in learning a foreign language, especially with regards to production rather than reception. These learning strategies or skills can also be applied to translation teaching methodology, where students put in practice their risk taking, avoidance, reduction and/ or compensatory strategies in getting the message across. We acknowledge translation as a writing task constrained by the source text. In addition, the translation and the writing cycles have in common a generation stage and a revision stage where grammatical, lexical and stylistic correctness is assessed. Somewhere in the middle between translation and writing skills lies MT (Machine Translation) post-editing that involves correcting the raw MT output with the aim of providing a quality text according to the intended purpose. Our research is intended to test the suitability of MT post-editing as an activity to promote error correction and, subsequently, to enhance written production in second and foreign language teaching.

Keywords: MT post-editing, raw MT output, translation, error analysis, error taxonomy.

1. MT post-editing: the repair framework

MT post-editing consists of repairing the MT output so that it can reach a higher degree of quality according to the purpose of the text and the prospective client/reader. Allen (2003:26) puts it this way: “the task of the post-editor is to edit, modify and/or correct a

pre-translated text that has been processed by a machine translation system from a source language into (a) target language(s)". He goes on to say that "post-editing entails correction of a pre-translated text rather than translation from scratch". According to this, the nature of MT post-editing lies somewhere in the middle of translation and writing skills as it involves being constrained by a source text and still having to consider correction and revision issues such as grammatical, lexical and stylistic accuracy.

Similarly, MT post-editing differs from translation editing in that the text that needs amendment has been translated by a machine and, consequently, the errors we are likely to find are going to differ from the ones we can expect from a human translation. MT post-editing in this sense is a more tedious task as it implies dealing with the amendment of recurrent and in many cases bizarre errors.

Figure 1 below illustrates the processes of writing, translation and MT in comparison. The generation stage (or *construction* stage as quoted by O'Malley and Chamot 1990), in the case of writing, refers to the brainstorming of ideas related to the writer's background knowledge of the topic and audience and to the planning of the text. These processes were considered by the writer of the source text, starting point of the translation process. The next step in the translation process would be the understanding of the source text where the translator abstracts a "mental conception" of the original text (Holmes, 1988). In the case of MT, analysis refers to the morphological analysis, the looking up of words in the MT dictionary and the parsing using a grammar of that language and semantic information from the lexicon to disambiguate the sense.

The three processes, likewise, have a transfer stage (or *transformation* stage as quoted by O'Malley and Chamot 1990) in common. In the writing process "translating" refers to the conversion of ideas into words. In translation Beeby (1996) speaks of "deverbalization" of the non-verbal semantic representation. In MT the transfer stage involves a change of structure so that the output is grammatically correct in the target language.

Translation and MT share a generation stage (or *execution* stage as quoted by O’Malley and Chamot 1990) where the message is rendered into writing. In translation Beeby calls it “reformulation”, where issues such as the content, the context and register, the purpose and the intertextuality of the target language text are taken into account together with the target language culture. In MT generation involves morphological generation, single word translation and word order determination.

Finally, and more relevant to our study, the three processes share an *editing* stage. In the case of writing reviewing takes place at all stages of the writing process, but especially at the end of the process where the author evaluates his/her own work. Editing in translation and second language learning has two main purposes according to Campbell (1998), i.e. correction and revision (see section 3 below). Both correction and revision are equally considered in MT post-editing, the only difference being the nature of the errors found in the target text, i.e. the raw MT output.

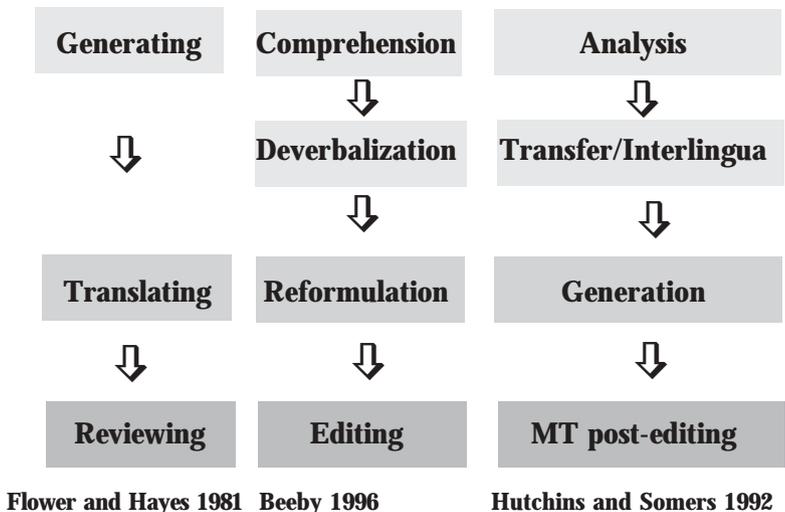


Figure 1: The processes of writing, translation and MT

2. Two interlanguages in need of repair :MT output vs. Student-edited output

The idea of *Interlanguage* (Selinker 1969) is founded upon the assumption that a second language learner, at any particular moment in their learning sequence, is using a language system which is neither his/her native tongue, nor the second language. According to Selinker it is from this point that the second language acquisition framework starts to be applicable to translation competence.

Interlanguage stems from error analysis, a theory that focuses on interpreting the errors made by learners as patterns related to processes or problems in learning. Error analysis evolved from considering errors as a sign of failure to the consideration of errors as evidence of the learner's developmental path with respect to the target language.

Error analysis is still of interest since errors which represent the product of learning can give us hints about the underlying process of learning and about the learning strategies attached to it.

Related to this notion of error is the "*non-binariness*" theory suggested by Pym (1992) for the evaluation of translation errors. Pym claims that a translation error must be non-binary, i.e. that a wrong translation is not opposed to a right translation but to many possible right translations. This theory suggests a reduction of binary errors and a comparative increase in non-binary errors as an excellent sign of general improvement in the foreign language.

The distinction between binary and non-binary errors has important implications for the teaching of translation and language learning.

All in all, we should consider both the raw MT output and the students' edited output as a developing system rather than an unacceptable version of an ideal target text.

3. Repair procedures: Error detection, correction and revision

In order to learn to amend an error we have to learn to recognise it first. *Error detection* has to do with the spotting of patterns of error and is closely related to correction and revision.

In *correction* (Campbell 1998) the translator attempts to correct structural target language errors. Correction is firmly based on lexico-grammar and it deals with spelling, morphological and syntactical errors. In *revision* (see Campbell 1998) the translator revises the text itself, regardless of its structural correctness. Revision has to do with semantic equivalence and with creating appropriate texts.

This notion of correction involves checking, verifying and correcting human and/or MT output with the aim of improving the overall result according to the purpose of the text. Related tasks to editing are error detection and correction; two activities which we intend to make use of in our study to develop awareness of errors, an ability very much needed in the production of texts in a foreign language.

4. Method

In the experiment participated 16 subjects, all of them advanced learners of Spanish and native speakers of English. They attended a ten-session course on MT post-editing. In the first session the students were introduced to MT, to its advantages and limitations, to the process of MT and the kind of errors that they were going to encounter during the course.

In the nine remaining sessions the students practised MT post-editing on paper of eight different text types, namely, an anecdote, instructions, an essay, a literary passage, a curriculum vitae, a letters of application, an email and an extract from a movie script.

In the course design the author took into consideration the students' needs and the syllabus for advanced level of Spanish used in the Cervantes Institute of Manchester. The objectives of the course were: to use MT post-editing as a foreign language teaching and learning tool, to revise grammar and vocabulary related to advanced level of Spanish, to practise reading comprehension and writing skills in the target language and to promote error correction and self-evaluation .

The students were given the source text in English and the raw MT output into Spanish translated by *SYSTRAN*. They would spot and correct the errors found in the MT output and send the corrected version via email to the teacher who would provide an individual correction at the end of the class. During the class the students would suggest different possibilities and/or alternatives of correction. Overall, they didn't seem to have trouble in spotting the erroneous parts of the MT output. However, the correction stage proved to be more difficult (see section 5 of this article).

Some of the students completed a final task where they had to find an English text related to their field of study, use three different online MT systems to translate it into Spanish, spot the erroneous parts of each translation and choose the translation with fewer errors to be used as the basis for MT post-editing. For the corrected version they were advised to use parallel texts in the target language together with general and specialized dictionaries and glossaries. In doing so, the students reported to have difficulties with terminology and with general vocabulary in specialized texts, with compounds, with grammar and with word order.

At the end of the course the students were administered a questionnaire to test how the experience of using MT post-editing had affected their *attitudes*. All the students demonstrated a positive attitude towards MT and MT post-editing. In general the students indicated the experience had given them more awareness of error detection and correction, more confidence and more accuracy and fluency in their written production. Moreover, they described this

activity as challenging, easy to do and non-threatening. A few students added that the MT post-editing experience could serve as a starting point in writing and that it had provided them with a better attitude towards writing.

Together with assessing the students' attitudes towards MT post-editing we also investigated their use of *learning strategies* during the course. As Chesterman (1998) already pointed out, there is an overlap between learning and communication strategies as both have to do with problems experienced by people when producing output in the foreign language. Chesterman talks about reduction, achievement and learning strategies. The first two strategies have to do with risk avoidance and risk taking in producing a target language text and the latter refers to methods used by language learners in order to achieve linguistic and sociolinguistic competence in the foreign language. Inspired by Chesterman (1997 and 1998) and the students' answers to the final questionnaire we can safely say that the students performed the following learning strategies for MT post-editing:

- creating their own opportunities for practice
- using any available references such as dictionaries, glossaries, parallel texts, etc
- monitoring their own production
- self-correction or repair
- asking for clarification
- cooperating with the teacher and with classmates
- changing register and style according to the text type and functionality
- guessing and inferencing
- reflecting on the meaning and use of words and expressions in context

- reflecting on language appropriateness and correctness
- repetitive practice (rehearsal)
- literal translation
- adding or omitting information
- rewriting
- using synonyms and cognates
- using different alternatives
- analytical comparison with the MT output and with ST
- analysing problems
- positive attitude towards MT errors and towards their own mistakes

The above procedures for text repair involve lexical, syntactic, semantic and pragmatic considerations as part of the methodology for foreign language text production (Nord, 1991). These learning strategies serve as qualitative data and can give us an indication of the cognitive skills required for this kind of activity.

5. Kinds of flaws

Following our error analysis methodology we proceeded to the categorization and quantification of MT and student edited errors. As illustrated in figure 2 and table 1 below in the raw *MT output* (1 sample, i.e. the raw MT output) the most predominant errors were lexical (45%) followed by grammatical (37%), spelling (16%) and discursive errors (2%).

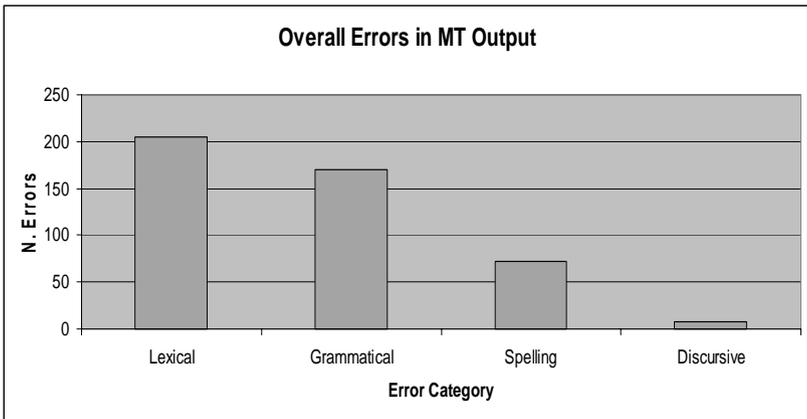


Figure 2: Overall MT output errors

Error category	Number of occurrences	Percent
Lexical	205	45%
Grammatical	170	37%
Spelling	72	16%
Discursive	8	2%

Table 1: Breakdown of Error Categories for the MT output

Figure 3 and table 2 below show the *students' edited output* (16 samples). In this case the grammatical errors (54%) are the most predominant ones followed by lexical (31%), spelling (12%) and discursive errors (4%).

The results indicate that for both MT output and students edited output grammar and lexical errors are the ones that caused more difficulty.

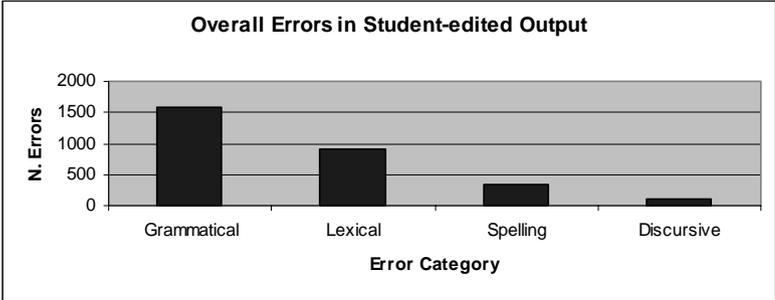


Figure 3: Students edited output errors

Error category	Number of occurrences	Percent
Grammatical	1,578	54 %
Lexical	899	31 %
Spelling	339	12 %
Discursive	114	4 %

Table 2: Breakdown of Error Categories for the student- edited output

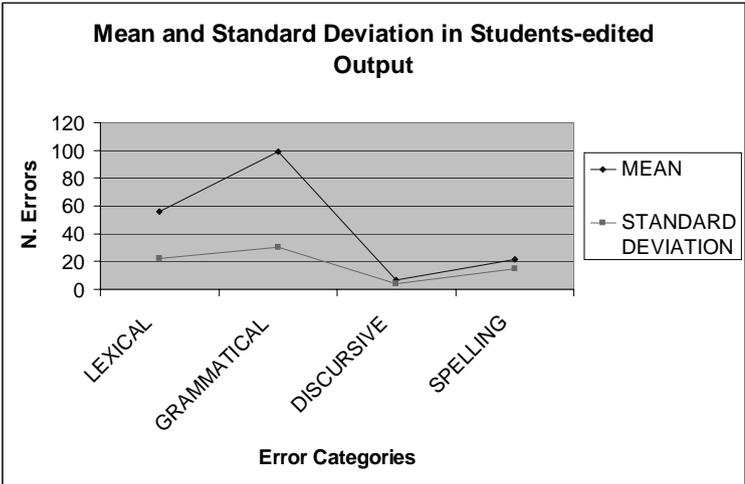


Figure 4: Mean and standard deviation in the students' edited output

Figure 4 above represents the mean and standard deviation in the students edited output. The mean or arithmetic average was calculated for each error category and indicates that grammatical errors are the most frequent ones in the students' work. The standard deviation represents the degree of similarity among the students' output and also it was calculated for each error category. The small distribution curve indicated that the students performed very similarly to one another as far as error typology is concerned.

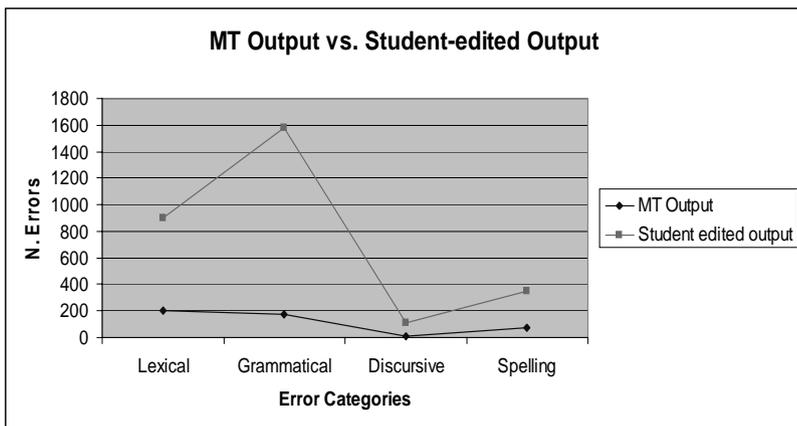


Figure 5: Distribution curve of the MT output versus the student edited output

Figure 5 above illustrates the distribution curves of the MT output (in blue) and the students edited output (in pink) in comparison. Although they are very different in size (since the MT output is only one sample as opposed to 16 samples of students edited output) they have a very similar distribution curve. The only difference is that in the MT output the most frequent errors found were lexical, whereas in the students edited output the most frequent errors found were grammatical errors. As for the rest of the error typology distribution for these interlanguages, they follow a very analogous pattern as shown above. This suggests that MT post-editing can in principle be used as a controlled error

correction exercise into the foreign language to promote grammatical and lexical accuracy.

To give an illustration of the difficulty of the different text types, figure 6 below shows the total of errors per text type found in the students' edited output. According to these data, the most difficult text was text number 3 (Essay), followed by text number 4 (Extract from a Literary passage), text number 7 (Emails), text number 2 (Instructions), text number 5 (CV), text number 8 (Movie script), text number 1 (Anecdotes) and, finally, text number 6 (Letter of application) was the one that caused less difficulty for the students.

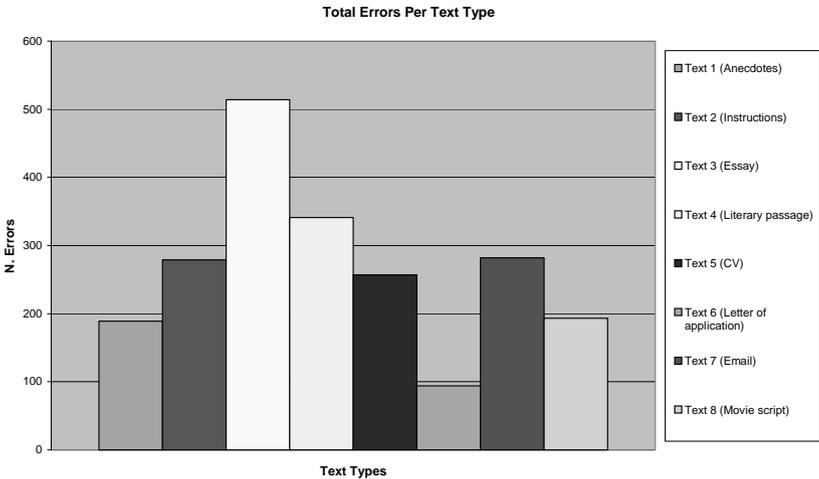


Figure 6: Total Errors per Text Type

In order to evaluate the suitability of MT post-editing to enhance foreign language production we should analyse how the errors induced by the MT output affect the students' performance. Figure 7 below illustrates the students' number of errors induced by the MT output and the number of errors not induced by the MT output, i.e. where the MT output is correct but the student overlooks it or considers it as erroneous.

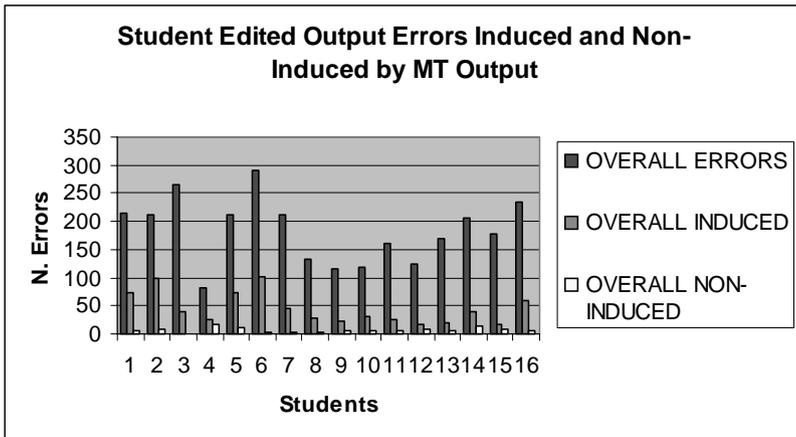


Figure 7: Student edited output errors induced and non-induced by MT output

In general, only a 24 % of the overall students' errors (2,930) were induced by the MT output, and only a 4 % of the overall students errors were not induced by the MT output, that is, were unsuccessfully corrected. These figures suggest that this activity is well suited for advanced learners of the foreign language (in this case Spanish) as a 24 % of errors induced by the MT output is quite a low figure, which indicates that the students were able to judge the incorrect parts of the MT output and to repair them accordingly in most of the cases. The skill of detecting and eventually correcting errors is very much linked to the students' command of the foreign language and is recommended only with advanced students of the target and foreign language.

If we have a look at the overall induced and non-induced errors per student (Figure 7) we will realise that the students with the highest number of errors (and, consequently, a lower command of the foreign language) trusted more the MT output and, as a result, had a higher rate of errors induced by it. For example, students 3, 6 and 16 are among the ones that have a highest error rate and have an overall MT output induced error rate of 15%, 35% and 25% respectively.

Thus, we can suggest that the ability to detect and correct errors (very much linked to the focus on form principle) is directly related to the students' overall command of the language. Therefore, we believe that an improvement in the students' ability to detect and correct the MT output and, eventually, their own output could lead to an enhancement in the students' command of the foreign language.

6. Testing the effectiveness of the repair

Effectiveness in this context is defined as improved learning. In this experiment we have used information on error analysis to describe the problematic areas and amendment strategies employed by advanced students of Spanish as they worked through the post-editing of MT output into the foreign language.

After identifying the most difficult areas for the students to post-edit, we arrived at the conclusion that both the MT output and the students' edited output had similarities with regards to error categorization. This implies that both interlanguages share some similarities and that, in principle, we can make use of MT post-editing as a controlled error correction exercise into the foreign language.

Work in progress includes the analysis of the number and subcategories of errors induced by the MT output and the number and types of errors made by the students where the MT output is correct.

The next step would be to provide a more comprehensive error typology that could serve as a threshold for the categorisation of MT post-editing errors English into Spanish for foreign language teaching/learning purposes. This analysis, together with a comparison of the MT post-editing with a control group doing translation on the same source texts, would give us more clues to investigate the possibilities that MT post-editing can offer to complement language tuition and to enhance foreign language written production.

7. Conclusions and further work

This article has focused on MT post-editing and its implementation for the purpose of learning and teaching a foreign language.

The results of the study indicate that MT and student edited output share lexical and grammatical errors mainly and that MT post-editing could, in principle, be used as a controlled error correction exercise into the foreign language.

The results also suggest that advanced students of the target language perceived MT post-editing as helpful as it provided them with more accuracy, fluidity and confidence in foreign language production. MT post-editing was especially good for creating awareness for error detection and correction as part of the revision stage of writing and translating.

By focusing on the MT output errors the students paid more attention to grammar and vocabulary (which proved to be the most difficult errors to correct) and experienced writing and translating as a process and not just as a product.

The analysis of the learning attitudes and strategies indicates, further, that this activity creates own opportunities for practising the foreign language, for cooperation, for self-evaluation, analytical comparison with L1, deductive and inductive reasoning among others.

The study supports Long's argument, that explicit formal instruction in grammar has effects on target language development and on strategy use (O'Malley 1987).

Based on the findings of the present study, MT post-editing should be investigated further with respect to its relation with translation. Such knowledge will help to investigate the possibilities that MT post-editing (as opposed to translation) can offer to complement language tuition and to enhance foreign language written production.

Bibliography

ALLEN, J. (2003) Post-editing. In Somers, H.L. (Ed.) *Computers and Translation: A Translators Guide*. Amsterdam: John Benjamins.

BEEBY L. A. (1996) *Teaching translation from Spanish to English*. Ottawa: University of Ottawa Press.

CAMPBELL, S. (1998) *Translation into the Second Language*. New York: Addison Wesley Longman

CHESTERMAN, A. (1998) Communication strategies, learning strategies and translation strategies. In Malmkjaer, K. (Ed.) *Translation and Language Teaching*. Manchester: St. Jerome Publishing.

CHESTERMAN, A. (1997) *Memes of Translation*. Amsterdam: Benjamins.

FLOWER L. S. and Hayes J.R. (1981) A Cognitive Process Theory of Writing. *College English*, 44, pp.

HOLMES J.S. (1988): *Translated! Essays and Papers on Translation and Translation Studies*, Amsterdam: Rodopi.

HUTCHINS, W.J. and Somers, H.L. (1992) *An Introduction to Machine Translation*. London: Academic Press Limited.

LONG, M. (1983) Does second language instruction make a difference? A review of research. *TESOL Quarterly* 17.

NORD, C. (1999) Translating as a Text-Production Activity. Available online at < www.fut.as/~apym/symp/nord.html > . Last accessed 01/12/2004.

O'MALLEY, J. and Chamot, A.U. (1990) *Learning Strategies in Second language Acquisition*. Cambridge: Cambridge University Press.

O'MALLEY, J. M. (1987) The effects of training in the use of learning strategies on learning English as a second language. In Wenden, A. and Rubin, J. (Eds.) *Learner Strategies in Language Learning*. NJ: Prentice-Hall.

PYM, A. (1992) *Translation and text transfer. An essay on the principles of intercultural communication*, Frankfurt am Main: Lang.

SELINKER, (1969) Language transfer. *General Linguistics*, 9.