

Constructivism Translation Training in Translation Process Workshops: The effect of Think-aloud Protocols in increasing Student Uncertainty Management

Mohamad Javad Baghiat Esfahani

Translation studies MA, University of Isfahan, Language and translator instructor at Jahad
language Center of University of Isfahan, IRAN
Email: Moh.baghiat@gmail.com

DOI Link: <http://dx.doi.org/10.6007/IJARBSS/v5-i1/1403>

Published Date: 08 January 2015

Abstract

Think-aloud protocols have been used for decades as a method for eliciting the activity which is occurring in a translator's mind. In this study think aloud protocols have been used not only as a data collecting method but also as a technique for training translators which may be effectual in increasing student's uncertainty management and solving problems. Uncertainty is an estate of indecision in the process of translation, and it is closely related to solving problem and uncertainty management during the translation activity. There are seventy-five upper intermediate ESL learners, who were taught translation in a fifty-five hour-translation process workshop, were using think-aloud protocols for translating texts. The study argues students who were using think-aloud protocols to verbalize the text may present better uncertainty management in their next translation activities. The result of study may show think-aloud protocols can be used in classrooms as a technique for teaching translation. In this study, four methodologies have been used; screen recording, sight translation, think-aloud protocols and interview.

Keywords: Translation Training, Constructivism, Uncertainty, Uncertainty Management, Thinks-Aloud Protocols.

1. Introduction and review of literature

Uncertainty principle may first relate to the physicist Werner Heisenberg who works on quantum mechanics. He comes to a conclusion which is impossible to observe the speed and position of a particle (Pym, 210). The more position of the particle is determined the less precisely the speed is measurable and vice versa (Heisenberg, 1927 p.172). Uncertainty in humanism is affected by the observers. Each translator or interpreter explains, justifies and interprets the text under the circumstances and their point of view differently. That's why stable comprehension is difficult to meet.

Uncertainty and uncertainty management is related to the process of translation. The analysis of the translation process is a complex task, and needs, however, some indirect methods in empirical research in the translation process (Albir & Alves, 2008). Among them is Think-aloud protocols (TAPs), (Ericsson & Simon, 1984; Sandrock, 1982; Gerloff, 1988; Tirkkonen-Condit, 1989; Lorscher, 1991; Kussmaul, 1991; Fraser, 1993; Kiraly, 1995).

Uncertainty is broadly defined by Angelone and Shreve (2011) as a cognitive state of indecision, manifested by a set of behaviors, which is occurring during the translation process. Uncertainty is related to some noticeable aspect of problem-solving and uncertainty management activity in the translation process. These behaviors are distinguishable by "interruptions" in the process, which is related to the uncertainty of a translator and inability to make decisions. Uncertainty is considered natural in all translation activity. (Angelone & Shreve, 2011)

An observable indicator of uncertainty in the translation process is interrupted. Some indicators like extended pauses in a source text encoding or a target text decoding, deletion or addition, cursor reposition, looking up dictionaries, the Internet searches, etc. there may also some physiological behavior, such as eye movement, and pupil fixations, brain activities, etc. (Angelone, 2010).

There are several studies, which explored the issue of uncertainty and uncertainty managements (Tirkkonen-Condit, 2005; Asadi & Seguinot, 2005; Hansen, 2003; Fraser, 2000). The result shows that professional translators are more tolerant about accepting and solving uncertainty, and they are more likely to use monitoring ability to provide feedback regarding what to do, or don't, for solving some specific problems. (Siren & Hakkarainen, 2002; Hansen, 2003; Shreve 2006). Monitoring is the ability of translators to recognize the nature and course of problem solving sequence, and provide feedback on the process of translation toward a solution and evaluation of that solution. (Angelone, 2010 P.19). Uncertainty managements (UCM) rather solving problems and monitoring, which is the state of cognitive science are closely related. (Fraser, 2000). There are plenty of studies related to monitoring in uncertainty management (e.g. Tirkkonen-Condit, 2005; Asadi & Seguinot, 2005; Hansen, 2003; Fraser, 2000). According to Shreve and Angelone, having this ability is related to expert's self-awareness of their capacity in problem solving through self-regulation and self-reflection (2011).

Angelone (2010) classified uncertainty management in three sequential bundles; comprehension-transfer-production, according to Shreve there are three translation locations; comprehension, transfer and production (2010). Comprehension is anything deals with understanding the source text, indicators like pause, looking up dictionaries, articulation in TAPs as ' I don't know the meaning of this' show uncertainty in comprehension location. Activity related to producing the target language like finding equivalence and equivalence structures are signifiers of transfer levels. The production level is anything relateding to editing activity as adding, revision, deleting, substituting, restoring and so on.

Aside from the three levels of uncertainty location, there are three fundamental uncertainty management levels, the first one is recognizing the problem, the second one proposing solutions and the last but not the least is the evaluation of that proposal and reaching the solution Angelone and Shreve (as cited in Amirian & Baghiat, 2014). These strategies, the problem-solving strategies, can be empirically observed in translation studies.

There are some indicators for each of this fundamental problem solving management. Problem recognition behaviors are conspicuous in think-aloud protocols and sight translation, some articulation like; 'I don't know' or some expletives like 'Hamm' and in other data collecting method as in screen recording and eye tracking some indicators like; pause, cursor movement, tone of voice, keyboard behavior, dictionary looks-up, eye fixation, pupil dilating and so on.

Solution proposal and evaluation of the proposals according to Tirkonnoen-Condit (2000) any activity which is related to solving problems indicating by finding a series of equivalence, reading through the text and rereading the text choosing between options by reading and adding and deleting and replacing. Any kind of behavior of reading like scanning, skimming revising while translating related to this phase of uncertainty management.

1.1 Think aloud protocol

Thin-aloud protocol or 'concurrent verbalization' refers to type of data collecting method, which is used in empirical translation process research. In think-aloud method the subjects are asked to verbalize whatever crossed their minds during the performance or here in the translation activity. The transcription of verbalization is called think-aloud protocols (TAPs).

The theoretical method of TAPs comes from cognitive psychology (Ericsson & Simmon, 1984/1993), accordingly information stored in different places; some of them in short memory (STM), characterized as essay access and limited storage capacity, and some of the in Long-term memory (LTM) which is more difficult to access and larger storage capacity. Based on cognitive psychology only the data which is in STM can be verbalized by the subjects.

The first application of TAPs as a method to translation was conducted by Gerloff (1986), Kring (1986), Lorscher (1986), which was related to classical verbalization by which the translators observed their own activity and thought. Ericson and Simon, on the other hand, carried the method in a more controlled data collecting type. They stated when there is an instructed and controlled method of think-aloud, TAPs except for slowing down the process doesn't change the process of the performance of translation.

There are some limitations to what type of information think-aloud may reveal, according to Ericson and Simon 1984/1993. Information which is in short-term memory (unconscious memory) is inaccessible. Think-aloud protocols may reveal some shadow of the process which is conducting in STM, but it may not be a complete one. According to Jakobson (2003) having a complete, reliable visage of mind of translators think-aloud protocols might be accompanied with some other method, triangulation method, like; screen recording, translog, interview, questionnaire, eye tracking and so on.

In addition to reliability, the validity of think aloud has crucial importance. And it has to be taken count. The question is; do TAPs actually reflect the process of translation? Jakobson (2003) and Kring (2001) in a different study show think-aloud protocol might affect the process of translation, but extend of which is under doubt, and it needs further studies. Their studies show that think-aloud protocols considerably slow down the process of translation. However, it doesn't change the course of the revision process. Jakobson in his study argues that participants who used think-aloud protocols produced a text with smaller segments and

units. (2003, P.45). Toury (1991) identified the influence of think-aloud on the product of translation, especially in the case of coherence and text segmentation. These findings may imply the influence of TAPs on the process of translation, but how and to some extent, needs further research.

Another concern for the TAPs methodology is the amount of verbalization; some researchers show that subjects produce few verbalizations (e.g. House, 1988; Seguinot, 1989; Li & Cheng, 2007). Other studies show subjects produce lots of data (e.g. Fraser, 1993; Shih, 2006b) the result may due to lack of preparation, motivation, instruction or may due to nature of languages.

Despite the limitation, TAPs have rendered an interesting result about the process of translation, comparing professional translators with novice translators, helping the pedagogical approach of translation.

1.2. Statement of problem: Socio-constructive strategy in Pedagogy of Translation Studies

For a long time in translator training the strategy was 'read and translate'. Students were given some random texts to translate. Then simply the instructor listens to student translations, ask for more alternatives, and then they reach a final production. Nowadays, as Grammar translation method is dated in teaching pedagogy the strategy of 'read and translate' is dated. Scholars try to sum to more scientific theatrically based approaches like: process centered approach (Gile, 1995), cognitive and psychological approach (Kiraly, 1995), situational approach Vienne (1994), task based approach (Hurtardo, 1999) and Socioconstructive approach (Kiraly, 2000).

In 2000, Kiraly published a book on translation training. The social constructivism was the basic notion of pedagogy in translation studies. Social constructivism argues about student self-concept and was opposed to entire transmission approach, the paradigm of decoding and encoding, according to transmissions paradigm knowledge can be moved like pouring water form on a dish to the bucket. Social constructivism, on the other hand, says a translator should actively construct the text they produce and a student is active in understanding and discovering the knowledge they are acquiring. This idea connects to some movement like a learner-centered approach, autonomous learning and action research. Accordingly, the classroom is based on practice, and students find their own way in groups and get together to talk about what they are doing.

In this study the look toward think-aloud protocol is not just a data collecting method perspective, but also it considers to think-aloud protocol as a technique in a classroom, which helps students construct their own understanding in group and in joint translation with their teachers. The study shows think-aloud is a useful technique in helping student having active participation of students in class, and helping them self-understand, self-discover and self-construct their own knowledge.

1.2.1. Research Question:

Considering the social constructivism approach (Kiraly 2000) can think aloud protocols be used as a technique in translation process workshops, helping students construct their knowledge by revealing the process of translation to pupils?

1.2.2. Hypothesis:

Using to think-aloud protocols as a technique in classroom of teaching translation process has no effect on improving student uncertainty management in the metacognitive activity of translation.

2. Method

Participants of this study are 75 English for second language learners (ESL), at Jahad Language Center of Isfahan. Each participants pass a placement test of FCE (First Certificate in English) with the score of A or B, a grammar test which is organized base on oxford practice Grammar (basic) (Coe et al., 2010) and finally a translation pre-test.

The translation workshop is organized according to 'translation technique' by Aladdin Pazargadi (2010). The book is based on English-Persian language structure. The materials of pre-test and post tests in parallel to each other, and they are based on the English-Persian structures which have been taught during the translation workshop.

The data collecting methods of this study are, Think-aloud protocols, screen recording, sight translation and an interview; screen recording is carried out by Camtasia V.8; students are supposed to translate the text with their computer, and the software will record the screen of their monitor, after the job is done the author and each participant in an interview writes a report about the process of translation. Sight translation is translating a written text into oral, student are supposed to read the source texts and translate the source texts orally, afterward in an interview, the student and the author write a report about the translation cognitive activity. Think-aloud protocols as well is another method in this study, which participants are asked to verbalize the process of translation.

Students first participated in a fifty-five hour translation workshop then after they attended an eight-hour translation process workshop which think-aloud protocols used as a technique for teaching students the process of translation. The teachers were supposed to verbalize the translation process of texts, which were not overlooked or translated before. Students, however, were allowed to ask questions about the process of translation. In another word, students and teachers in joint translation verbalized the process of translation.

Table 1 shows the syllabus of the translation workshop. There are one pretest and two posttest, posttest A and posttest B. All the tests are parallel and organized according to the material of the syllabus of the class. Pretest carried out by screen recording and sight translating since students were not aware of thinkaloud protocols but post tests were carried out by think-aloud protocols, screen recording, sight translation methods and an interview.

Table 1, syllabus

Theory of translation studies	Editing, and punctuation
Translation steps	Working with Microsoft word
How to use dictionaries	Contrastive analysis and error analysis of short stories, novels and different kinds of text as political texts and literal texts
English Grammar	Translation movies and news
Persian Grammar	Teaching how to use Camtasia software v.8
Translation of different structure of English and Persian (Noun, adjectives, adverbs, verbs, phrases, clauses, independent and dependent sentences and ...	Instructing Think-aloud protocols and sight translation
Writing essay in English and Persian language	Letter writing and translation.

3. Result and discussion

The study shows some substantial change in subject behavior in recognizing and solving uncertainty in the process of translation. And it argues think-aloud protocols may be considered one of the useful techniques in translation pedagogy. By showing students the process of translation of their mind and help them self-evaluate and self-construct their translation.

3.1. Unit of translation:

Unit of translation refers to a linguistic level at which source text is codified into the target text (Shuttleworth, 1997). The unit of translation may be different linguistic level, word, terms, smaller than the sentence level and bigger than the term level as clauses, phrases and so on, sentence level and beyond the level of sentence. According to some studies (e.g. Fraser, 1996; Tirkkonen-Condit, 2000) students tend to word levels, whereas professional translators are more likely to sentence and beyond the sentence level. This study shows that students who use think-aloud protocols may go toward sentence and beyond the sentence level in translating English text into the Persian language.

Table 2, Unit of translation

Participants	Words	Terms	Smaller than sentences, clause, phrase	Sentences	Beyond sentence level
Pre test	42.7%	27.7%	16.4%	11.3%	1.9%
Post test A	29.7%	18%	29%	21%	2.3%
Post test B	18%	12.6%	28%	30%	11.4%

3.2. Uncertainty and uncertainty management

There are three levels in the translation process which a translator encounters uncertainty and problems; *comprehension, transfer and production level*. *Comprehension level* is when the translators try to read and understand the idea of the source text in whole or details, the indicator of uncertainty and uncertainty management at this level is the 'interruption'

manifested in pause to re-read the text or and check the dictionaries or other interfaces. This pause is observable in screen recording or voice recording. This uncertainty is verbalized in the think-aloud protocols though.

Transfer level is any activity, which is applied on the paper or utterance. The indicator here again is '*interruption*' to look dictionaries or other interfaces up, re-read the source text and translated text and or edit the target text. *The production* is everything related to revision. The last adding, omitting or replacing are activities occurring in production.

Table 3, Uncertainty location

Participants	Comprehension	Transfer	Production	Unclassified
Pre test	48.5%	23.6%	26.9%	1.0%
Post test A	26.9%	31.1%	38.8%	1.8%
Post test B	30.9%	49.6%	19.2%	0.4%

The study shows students in the translation process workshop tend to manage uncertainty in comprehension and transfer level. This may show the professional behavior side of participants in the translation process workshop since professional translators manage uncertainty in comprehension and transfer level according to (Angelone, 2010 & Shreve, 2006). Students may be awarded that a professional translator doesn't postpone the uncertainty management to production level. This behavior may have lots of reasons. Novice students are less potent to see the problem in comprehension part. They most often don't notice problems due to the lack of experience and knowledge, after the job is done, they see the deficiency of their translation in the last draft of their product whereas a professional translator tries to see the context of their job. Experts based on their experience and knowledge, would know what may cause a problem in the future drafts.

3.3. Uncertainty management procedures

According to Angelone 2010, there is an uncertainty management procedure in every translation process; first, the translators recognize the problem, then they propose some solutions by using their linguistic knowledge or translational tools as dictionaries, the Internet and other translation aids and finally the translator edits and evaluates their solution proposals.

The study argues student who was taught the translation process act more. Like a professional translator, they recognize the problem more than other students and their obviously propose more solutions to the problems. It may Due to their context look of students in protest, the solution proposal needs little editing and evaluating. Table 5 illustrates the holistic view of students in the translation process workshop whereas the micro view of other students. Table 4, indicates the professional like behavior of students who were in translation process workshop using think-aloud protocols as technique.

Table 4: Uncertainty management

Participants	Uncertainty recognition	Proposals	Editing	Unclassified
Pre test	20.7%	23.2%	55%	1.1%
Post test A	29.2%	29%	41%	0.8%
Post test B	45.7%	40.7%	11.3%	2.3%

Table 5: Textual level of uncertainty management

Participants	Lexis	Term and expression	Syntax	Sentential	Macro level Beyond sentence level
Pre test	41.3%	29.9%	18.1%	9.8%	0.9%
Post test A	21%	31.9%	25%	14.5%	7.6%
Post test B	16%	15.6%	20.1%	29%	19.3%

3.4. Automaticity

One of the aspect of professional translator behavior is automaticity result from extensive practice in the field of translation. (Tirkkonen-Condit 1989 & Seguinot 1989). Table 6 shows the decreased number of pauses, cursor movements, clicks and dictionary looks up in the process of translation of student in the translation process workshop, and also the decreased time of revising and time of translation are all indicators of automaticity behavior of students who were exposed to the process of translation pedagogy.

Table 6, physical factors

Participants	Average number of cursor movement	Pause >3	Average time of revising in transfer level	Average time of revising in production level	Average number of dictionary looks up and other interfaces	Average time
Pre test	234	29	8.3	6.2	17	10.9
Post test A	201	16.5	8	4.8	12	8.5
Post test B	163	8	6.3	3.5	11	7.2

4. Conclusion

Donald Kiraly 2000 argues that students should actively participate in their learning and they should construct their understanding and their knowledge. Accordingly, students should learn translation in learner centered education and autonomous learning. This study considers think-aloud protocol as a technique helping student understanding the process of translation. Students by using think aloud protocol and comparing their process of translation with other students will understand the weakness of their behavior in translating a text. Uncertainty as a natural occurrence in translation, which need uncertainty management is one of the important issues of translation cognition and psychological aspect of translation. The study argues TAPs may help students understand about a translation process and it may be an appropriate technique in translation workshops.

Students who participated in a translation - process workshop in which think-aloud protocols were used to revealing the process of translation significantly have different metacognitive behavior toward solving the problem. Unit of translation were more toward larger linguistic units; sentences and beyond sentences (table 2).

Students in training based on the process of translation, construct their knowledge and skills in translation by looking through the process of their instructors's minds therefore they significantly may manage uncertainty as professional translators do. Students as a

professional translator solve the problems more on comprehension and transfer location rather than production level, whereas other students, post pone the uncertainty management more to production location (table 3). In addition, participants In Translation-Process workshop manage uncertainty in longer linguistic units; syntax, sentential and beyond the sentential level while trainers in product-translation workshop tended to solve the translation problems in Lexis and term levels (table 5). The increased number of problem recognition and proposals in table 4, may state the professional behavior like of participants who were taught translation based on think-aloud protocols.

Increased Student's automaticity behavior (table 6), which is a professional behavior, the larger unit of translation, uncertainty management in larger linguistic units which is conducted on comprehension and transfer level and students' increased problems recognitions and proposals may indicate students' increased professional behavior.

This study argues translation process-oriented training may help students manage uncertainty as a professional does. Moreover, students in a process oriented classrooms construct their translation knowledge and skills by looking through the process of translation which happening in a professional translator's mind. This research may be one of the first steps toward translation process workshops there have to be more studies and researches on the merits and demerits of process oriented translation training, and more importantly, there have to be studies of how to design a classroom atmosphere in which process of translation is conducted.

References

- Albir, A. H., & Alves, F. (2008). Translation as a Cognitive Activity. In J. Munday, *Routledge Companion to Translation Studies* (pp. 54-73). New York: Routledge.
- Albir, H. (1999). *Enseñar a traducir. Metodología en la formación de traductores e intérpretes*. Madrid: Edelsa.
- Amirian, Z., & Baghiat Esfahani, M. J. (2013). Uncertainty and Uncertainty Management: the Metacognitive State of Problem-Solving of Professional (experienced) Translators and Students of Translation Studies. *International journal of English language and translation studies*, 223-242.
- Angelon, E., & Shreve, G. (2011). Uncertainty management, metacognitive Bundling in problem solving and translation quality. In S. O'Brian, *Cognitive Exploration of Translation* (pp. 108-129). Amsterdam: Cambridge University Press.
- Angelone, E. (2010). Uncertainty, uncertainty management and metacognitive problem solving in the translation task. In G. M. Shreve, & E. Angelone, *Translation and Cognition* (p. 18). Amsterdam: Benjamins.
- Asadi, P., & Seguinot, C. (2005). Shortcuts, Strategies and general patterns in a process study of nine professionals. *Meta* 50 (2), 522-547.
- Buchweitz, A. (2007, March 16). Two Languages, Two Input Modalities, One Brain: An fMRI study of Portuguese-English bilinguals and Portuguese listening and reading comprehension effects on brain activation. *Unpublished PHD thesis*. Santa Catarina, Brazil: Universidade Federal de Santa Catarina.
- Cheng, L. a. (2007). Monologue vs. dialogue, verbal reporting: research subjects. *Journal of Translation Studies* 10.1, 43-56.
- Coe, N., Harrison, M., & Paterson, K. (2010). *Oxford Grammar Practice*. Oxford: Oxford.
- Ericsson, A. K., & Simon, H. A. (1984/1993). *Protocol analysis: verbal report as data*. Cambridge: MIT Press.

- Ericsson, K. A., & Simon, H. (1984). *Protocol Analysis: Verbal reports as data*. Cambridge: MIT Press.
- Fraser, J. (1993). Public accounts: using verbal protocols to investigate community. *Applied Linguistics* 14.4, 325-43.
- Fraser, J. (2000). What do real translators do? Developing the use of TAPs form professional translators. In S. Tirkkonen-Condit, & R. Jasskelaineen, *Tapping and Mapping the processes of Translation* (pp. 111-121). Amsterdam: John Benjamins.
- Gerloff, P. (1986). Second language learners report on the interpretive process. In J. House, & S. Blum Kulka, in *interlingual and intercultural communication. Discourse and cognition in translation and second language acquisition studies* (pp. 243-262). Tübingen: Gunter Narr.
- Gerloff, P. (1988). *From French to English: A look at the translation process with students, bilinguals and professional translators*. Cambridge: Harvard University Press.
- Gile, D. (1995). *Basic Concepts and Models for Interpreter and Translator Training*. Amsterdam: John Benjamins.
- Hansen, G. (2003). Controlling the process: theoretical and methodological reflections on research into the translation process. In F. Alves, *Traiangulating Translation* (pp. 25-42). Amsterdam: John Benjamins.
- Heisenberg, W. (1927). Über den anschaulichen Inhalt der quantentheoretischen Kinematik und Mechanik. *Zeitschrift für Physik*, 172-198.
- House, J. (1988). Talking to oneself or thinking with others? On using different think aloud methods in translation. *Lernen, Fremdsprachen Lehren and lernen* 17, 84-98.
- Jakobsen, A. L. (1999). Effect of thinking aloud about translation speed, revision and segmentation. In F. Alves, *triangulating translation: perspectives in process oriented research* (pp. 73-101). Amsterdam and Philadelphia: John Benjamins.
- Jakobsen, A. L. (2003). Effects of think aloud on translation speed, revision and segmentation. In F. Alves, in *Triangulating Translation. Perspective in Process Oriented Research* (pp. 69-95). Amesterdam & Phiadelphia: John Benjamins.
- Kiraly, D. (1995). *Pathways to translation: pedagogy and process*. Kent, OH: Kent state university press.
- Kiraly, D. C. (2000). *A Social Constructivist Approach To Translator Education, Empowerment From Theory to Practice*. Manchester: St. Jerome.
- Krings, P. H. (1986). Translation problems and translation strategies of advanced German learners of French (L2). In J. House, & s. Blum-Kulka, in *interlingual and intercultural communication: discourse and cognition in translation and second language acquisition study* (pp. 263-275). Tübingen: Guner Narr.
- Krings, p. H. (2001). *Repairing texts. Empirical investigations of Machine-Translation Post editing Processes*. Kent: Kent State University Press.
- Kurtz, I. (1993). EEG probability Mapping: Detecting Cerebral processes during mental simultaneous interpreting. In *The Jermome Quarterly* 8 (pp. 3-5). National Resource Center for Translation & Interpretation.
- Kussmaul, P. (1991). Creativity in the translation process: empirical approaches. In v. I.-Z. k.M., & T. Naaijken, *translation studies* (pp. 91-101). The state of art, Amsterdam and Atlanta: GA: Rodopi.
- Lorscher, W. (1986). Linguistic aspects of translation process: towards an analysis of translation performance. In J. House, & Shoshana Blum Kulka, in *interlingual and*

- intercultural communication. Discourse and cognition in translation and second language Acquisition studies* (pp. 277-292). Tübingen: Gunter Narr.
- Lörscher, W. (1991). *Translation performances, translation process, and Translation strategies: A psycholinguistic investigation*. Tübingen: Gunter Narr Verlag.
- O'Brian, S. (2006). Eye-tracking and translation memory matches. *Perspectives: Studies in Translatology* 14, 185-205.
- Pazargadi, A. (2010). *Translation technique*. Tehran: Amir Kabir press.
- Pym, A. (2010). *Exploring Translation Theory*. New York: Routledge.
- Sandrock, U. (1982). Thinking aloud protocols (TAPs). Unpublished PhD thesis Universität Kassel.
- Seguinot, C. (1989). The translation process: an experimental study. In C. Seguinot, *The Translation Process* (pp. 21-53). Toronto: H. G. Publications.
- Shih, C. (2006b). Translators' revision processes: global revision approaches and strategies. *Ph.D thesis*, University of Newcastle upon Tyne.
- Shuttleworth, M. (1997). *Dictionary of Translation Studies*. Manchester: St, Jerome.
- Siren, S., & Hakkarainen, K. (2002). Expertise in translation . *Across languages and Culture* 3 (1), 71-82.
- Tirkkonen-Condit, S. (1989). Professional versus non-professional translation: a think aloud protocol study. In C. Seguinot, *The Translation Process* (pp. 73-88). Toronto: H.G Publications.
- Tirkkonen-Condit, S. (2005). The monitor model revised: Evidence from process research. *Meta* 50 (2), 405-414.
- Toury, G. (1991a). Experimentation in Translation studies: Achievements, prospects and some pitfalls. In T. Condit, *empirical research in translation and intercultural studies* (pp. 45-66). Tübingen: Narr.