*Journal of*

# University of Zakho

## *B - Humanities*

# Contents

# THE EFFECT OF USING A COGNITIVE BASED METHOD ON THE STUDENTS' ACHIEVEMENT IN TRANSLATION

Ahmed **Kh**alis **Sh**alan
Faculty member at Nawroz University, Kurdistan Region-Iraq.
*(Accepted for publication: May 4, 2014)*

## Abstract

This study was carried out in 2009, and lasted about 3 months from 1ˢᵗ Oct. to the end of Dec. 2010 (about 11-12 weeks).

In this study, the researcher hypothesized that using a recent modern approach based on cognitive principles, namely the 'task-oriented approach', in teaching translation would not make any statistically significant difference in the students' achievement.

The students, of the Department of English/College of languages/University of Baghdad, were chosen as a research community, and consequently, the 2ⁿᵈ-year students of the department were chosen as a specimen of the department-students-community.

The researcher divided the student-specimen (120 participants) into 2 groups: group A and group B (each consists of 60 participants). With group A, a traditional approach of teaching, in terms of applied linguistics called the 'teacher-controlled approach', was used. It is well-known that this approach gives the teacher a dominant role, much bigger than that of the student's in the teaching-learning process, i.e., the teacher takes the lead in every step of the process in the classroom; helping the students to identify the problematic points in translation and he also suggest, more than the students do, the strategies to overcome such difficulties. Meanwhile, a different modern approach was used with group B; an approach called the 'task-oriented approach'. This approach is practically passed on giving the student a dominant role, i.e., the students are given assignments to be done at home, which implicitly means that the students have to identify the problematic points in translation themselves, and find the proper strategies to overcome the difficulties. Finally, according to this approach they bring their achievements to be discussed in the classroom.

Before initiating the experiment, a pre-test was conducted to examine the equivalence in abilities between the two groups of the specimen. The test results proved a convenient equivalence between them.

Furthermore, during the first 2 weeks (an average of 4 academic hours) of the experiment, the two groups of the specimen were given theoretical and general knowledge about translation and of a good translator.

Then, the following step was to apply the two proposed approaches on the two groups in teaching translation. Parts of a course-book called *'Advanced English for Translation'* were selected as a syllabus for the experiment. The two groups were given, for 8 weeks, the same lessons and the same texts to be dealt with as training in translation, according to the approach of teaching chosen for each group as mentioned before.

Afterwards, an achievement-test was designed. The items of the test were chosen from the same course-book, as an unseen passage (not one of the passages the students dealt with before). The test items and materials' validity was examined by a group of specialists.

Finally, conducting the achievement-test, the analysis of the students' results has shown two levels of findings:

- Horizontally, the results were in favor of group B (following the 'task-oriented approach'); 55 students out of 60 passed the exam, whereas only 42 students out of 60 passed the exam from group A (following the 'teacher-directed approach), and

- Vertically, the test's results, examined by specialists in evaluation and assessment, have shown statistically significant differences in favor of the modern cognitive approach in teaching, the 'task-oriented approach', manifested by the achievements of group B.

## 1- Introduction

**T**he facts of life indicate that change is the dynamic law of existence; everything related to man, in this world, is apt to development, or at least to improvement.

Doubtlessly, the syllabus currently taught in the Department of English/ College of Languages, which has been applied for at least two decades, should now be reconsidered; in respect of whether it still satisfies the needs of the learners or not. That is, however the current syllabus was justified at a time; it would have become unable to respond to nowadays increasing needs of the students in a time, when English is tilting to be a second-language. This is, especially when the students increasing needs are taken in the light of the continuously happening developments in the field of Foreign Language Teaching (henceforth FLT) in general, and in the field of Translation Teaching (henceforth TT) in particular.

Hence, it is the time to investigate the adequacy of the syllabus of translation (which has been taught for long), whether vertically or

1

horizontally. Although discussing the shortages of the said syllabus is not one of the concerns of this paper, they can be briefed in the following points:

1- The syllabus is too prescriptive to encourage the learners to use their talents realizing highly-qualitative achievements in translation.

2- The syllabus is not originally designed for two-hours-weekly translation course, as it is the case in the Department of English/College of Languages, i.e., it is rather designed for TT situations which differ largely in conditions (objectives, number of hours, degree of majoring, etc.)

3- Though the syllabus provides the learners with situational usages of language and how to translate them, it does not provide them, but very little, with the chance to put such usages in authentic translational contexts. And thus it underestimates the students' needs to go to their logical ends in achieving a real text translation.

Therefore, following a new method based on the latest cognitive principles of ELT, the researcher has undertaken an experiment of teaching a new course in translation from the very beginning of the academic year 2007-2008, lasted for about 3 months (from the beginning of October 2010 and lasted for about 11-12 weeks).

This paper is dedicated to showing the steps of this experiment in an authentic situation of both, TT and Language Teaching (henceforth LT) and the findings gained from the experiment.

## 2- Aims of the Study

This paper aims at:

- Making a comparison between two different approaches in TT, in order to find out the effect of the 'task-oriented approach' on the process of translation.

- Eliciting reliable judgments about the second year EFL learners' (Department of English/College of Languages/University of Baghdad) talents and abilities in translation, via an experiment.

## 3- Hypothesis

It is hypothesized that there are no statistically significant differences between the achievement of the students who are **taught translation** by the traditional method '**teacher-directed approach**' and those who **study translation** by using a new method based on certain cognitive principles, '**task-oriented approach**' of TT.

## 4- Value of the Study

This paper is particularly trying to provide, via practically justified steps, the preliminary grounds of modernizing the translation syllabus in the Department of English/College of languages/ University of Baghdad. So, it may ultimately provide new horizons for researches to open the page of cognitive learning in translation.

## 5- Limits

The study is limited to the second-year students/Department of English/College of Languages/University of Baghdad and the two-hours-weekly-course of translation they are taught for the academic year 2009-2010.

## 6- Definitions of Basic Terms

For the sake of this study, the relevant terms are defined as follows:

- **Achievement test**: It is a test, which is designed to measure how much the language learners have successfully learned with specific reference to a particular course, text-book, or program of instruction, and according to a certain teaching/learning approach (Hughes 1989- cited in Johnson & Johnson 1999).

- **Form-based Translation**: It means teaching which focuses on control of formal aspects of language such as the grammatical features of a specific type of discourse or text, e.g. narrative (Larson 1984).

- **Meaning-based Translation**: It is an approach in translation which pay attention to meaning more than to form (Larson 1984).

- **Student-centered**: it refers to the methods of teaching which (a) emphasize the active role of students in learning, (b) try to give learners more control over what and how they learn, and (c) encourage the learners to take more responsibility for their own learning (Butts 1974; Sheerin 1989).

- **Task-oriented Approach**: This term is borrowed from the term 'task' in Applied Linguistics. And 'task', in terms of teaching, is an activity which is designed to help achieve a particular learning goal (Nunan 1989; Grookes and Gass 1993a; Parbhu 1987- cited in Johnson & Johnson 1999)

- **Teacher-directed:** It is a teaching style in which everything in the classroom is managed and controlled by the teacher. Many current teaching methods try to encourage less teacher-directed interaction (Butts 1974).

**7- Methodology of the Experiment**
**7-1 Experimental Design**

The aim of the current research is to compare the effect of two different approaches on academic achievement in TT: the *'teacher-directed'* one and the *'task-based'* one.

Therefore, the researcher depended on an experimental design for its necessity for the aims of the research (Vandalin, 1985: 364), whose final touch would be an achievement post-test for the two groups according to the diagram given in **Figure No.1**:
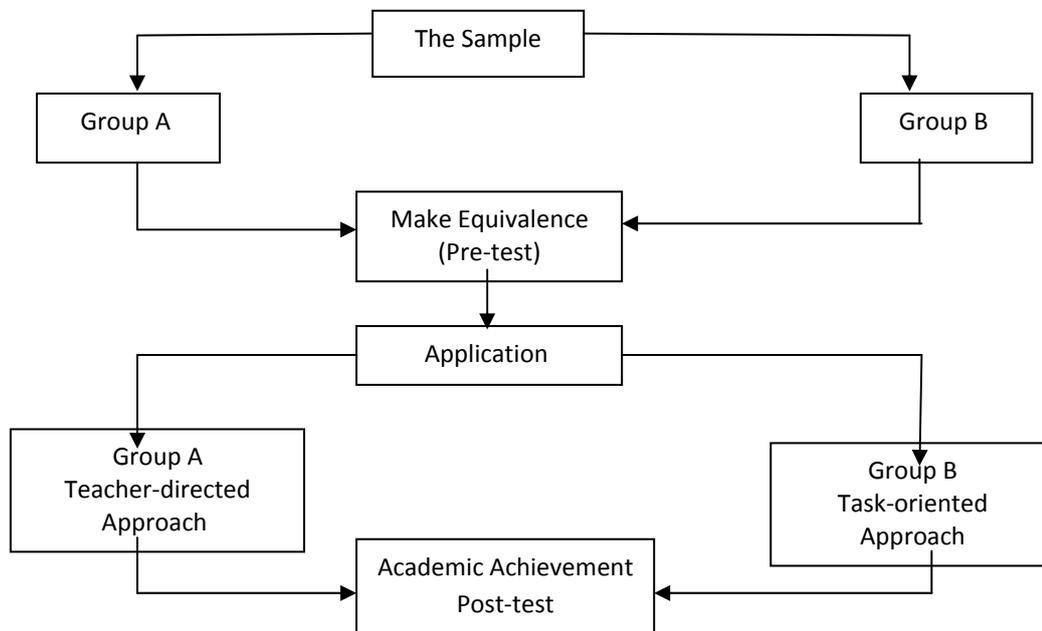
```
                        ┌─────────────────┐
                        │   The Sample    │
                        └─────────────────┘
              ┌──────────────┘       └──────────────┐
         ┌──────────┐                          ┌──────────┐
         │ Group A  │                          │ Group B  │
         └──────────┘                          └──────────┘
              │          ┌─────────────────┐        │
              └────────▶ │ Make Equivalence │ ◀──────┘
                         │   (Pre-test)     │
                         └─────────────────┘
                                 │
                         ┌─────────────────┐
                         │   Application   │
                         └─────────────────┘
         ┌───────────────┘                 └───────────────┐
  ┌──────────────────┐                          ┌──────────────────┐
  │     Group A      │                          │     Group B      │
  │ Teacher-directed │                          │  Task-oriented   │
  │     Approach     │                          │     Approach     │
  └──────────────────┘                          └──────────────────┘
              │        ┌──────────────────────┐        │
              └──────▶ │ Academic Achievement  │ ◀──────┘
                       │      Post-test        │
                       └──────────────────────┘
```

**Figure No. 1**
**Experimental Design**

**7-2 Experiment Population**

The population of the experiment comprised about 120 2$^{nd}$-year students at the Department of English/College of Languages. But, for procedural reasons the sample was divided into 2 groups:

- *Group A* (60 learners), that was taught translation according to the "**Teacher-directed Approach**", and
- **Group B** (60 learners), that was taught translation according to the "**Task-oriented Approach**".

**7-3 Duration of the Experiment**

The experiment lasted for about 3 months; from the 1$^{st,}$ Oct. to the end of December, 2010 (around 11-12 weeks).

**7-4 Syllabus**
**7-4-1 Selection of the Materials**

The materials chosen to be used in the experiment were selected from *'Advanced English for Translation'* by Dennis Chamberlin & Gillian White. As a matter of fact, "This book is designed for upper-intermediate and more advanced students of all nationalities, who need to use English in their work." (Chamberlin &

White 1993 p.2). Furthermore, the text-book is designed to achieve the following objective:

- To provide practice in those areas of English which are known to cause difficulty to foreign learners. (Chamberlin & White 1993 p.2)

Furthermore, this course-book involves various types of texts (36 texts) selected for translation, graded deliberately to respond to the student translation' needs in many fields, and representing the available styles and registers found in the contemporary written English. Naturally, a text in such a translation-course should inevitably be followed by exercises focusing on the **most problematic cases** that would face the translator, not to mention putting **emphasis on certain kinds of the many-fold words and expressions** found in English via usages and idioms.

**7-4-2 Objectives**

The syllabus was chosen to achieve the following objectives:

**General**:

a- Provide the materials that would enable the translation-work to become a positive process (in the short run), and

b- Energize the students to enjoy the language learning activity by their own (in the long run).
**Specific**:

- Specify the areas of English which cause much difficulty to the EFL learners in translation and figure convenient strategies out by themselves to solve the problems they face in translation.

### 7-4-3 Design

The syllabus that has been chosen to be taught to the students during the experiment period was a procedural syllabus, i.e., a translation textbook of a design that is supposed to meet the objectives in the mind of the experiment's undertaker. This syllabus consists of texts chosen from various sources, and followed by exercises about the **areas of English which cause problematic difficulty** to the foreign learners in translation.

### 7-5 Teaching Approach

As the experiment sample was divided into two groups: **group A** and **group B**, in TT, two approaches of teaching were used. With **group A**, a **'teacher-directed approach'** (traditional one) was followed, and a **'task-oriented approach'** (a recent- cognitive one) was adopted with **group B**, as follows:

- **For Group A**, the teaching approach was based on fulfilling the process of translation as whole in the classroom, in which **the teacher plays the major role** in identifying the difficulties, and suggesting the strategies to solve such difficulties.

- **For Group B,** the teaching approach is much currently used in ELT, and based on giving the students a weekly assignment, in order **to go and try themselves to identify the difficulty areas, and try by their own to find strategies to solve the difficulties**.

The following table shows a comparison between the two methods:

**Table (1):** Contrastive points between the Teacher-directed Approach and the Task-oriented Approach

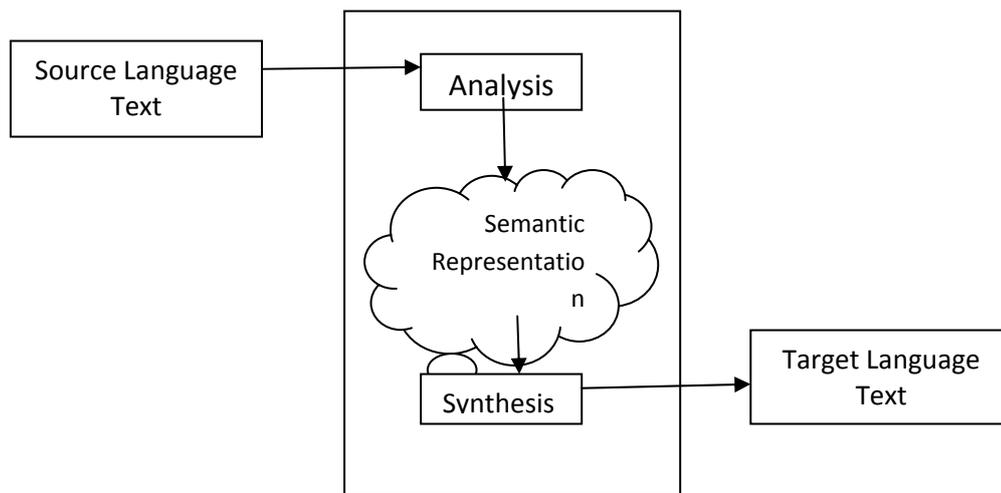| Teacher-directed Approach | Task-oriented Approach |
|---|---|
| Teacher-directed (Butts Prescriptive (Bell 1991) Imitative Form-based ;sentence structure comes first (Larson 1984) | Student-centered (Dickinson 1988) Descriptive (Bell 1991) Creative Meaning-based ;sentence-meaning comes first (Larson 1984) |

It is worth mentioning here that, in an attempt to apply it in TT, the **'task-oriented approach'** used in this experiment was borrowed from what is technically called **'task-based language teaching'**, used in the ELT discipline. It is argued that one of the characteristics of this approach is to focus on the nature of the learning process activities (Johnson and Johnson 1999). Hence, since the **'task-oriented approach'** is practically supposed to be organized around **tasks carried-out by the learners themselves** (Richard and Schmit 2002), rather than the Teacher-controlled one, which is closely managed, and directed by the teacher, the approach in this experiment is almost built on Prabhu's (1987) hypothesis which argues that " . . . structure can be best learned when attention is focused on meaning." (Richard & Schmidt 2002).

Furthermore, the experiment is theoretically built on an overriding principle in translation discipline, which argues that **translation is basically a meaning-based one**. That is, 'once the translator has defined the meaning of the source text, his goal is to express that same meaning in the receptor language (Larson 1984).

Therefore, in the course of the experiment the same theoretical basis was put into practice for the two groups (**A** & **B**) in the process of translation. It is the use of what, in terms of translation, is called the **'meaning-based translation'.** Meanwhile, pedagogically, the **'teacher-controlled approach'** was followed with **group A**, and the **'task-oriented approach'** was adopted for **group B**.

### 7-6 Model of the Translation Process

As a guide to the translation process, the model used in this experiment is borrowed from Bell (1993). This model represents, comprehensively, the process of translation as follows in **Figure No. 2**.

```
┌─────────────────┐          ┌──────────────┐
│ Source Language │─────────▶│   Analysis   │
│      Text       │          └──────────────┘
└─────────────────┘                  │
                                     ▼
                         ╭────────────────────╮
                         │      Semantic       │
                         │   Representatio     │
                         │          n          │
                         ╰────────────────────╯
                                     │
                                     ▼       ┌──────────────────┐
                          ┌──────────────┐   │ Target Language  │
                          │  Synthesis   │──▶│      Text        │
                          └──────────────┘   └──────────────────┘
```

**Bell (1993); Model of the Translation Processes**

The model represents the transformation of a source-language text into a target-language text via processes taking place in the memory:

a- Analysis of a source-language text into universal semantic representation, and

b- Synthesis of semantic representation into a target-language text. (Bell 1993)

Building on the fact that as the learner has had a long period of exposure to both, his/her native language and the EFL learning, then he/she is supposed to be aware enough of how to decode and to encode in both languages, Arabic and English. Hence, in order to make the student feel on firm ground, the process represented in the above-mentioned model can be rendered, in practice, by the teacher; asking them to do the following procedural steps (or series of tasks):

**1-      Analytically:**

- Do a pioneer reading of the text from top to bottom,

- Reread it again underlining the semantically unfamiliar words and expressions and putting them in a list, and then

- Reread it once more in the light of knowing almost the general meaning of the text in order to comprehend its core meaning (this step may help the student's achieving the universal semantic representation of the **source-language text**.

**2-      Synthetically:**

- Start translating the text, sentence by sentence, not word by word (regarding the equivalents on both levels; *word* and *expression*),

- Reread the resultant target-language text, in order to make any necessary modifications in the meaning of the sentences due to the message context of each paragraph, and

- Reread the resultant text in order to make any necessary modifications due to the whole text message coherence; in other words, to make sure that quality of meaning, unity, and purpose are all reasonably perceived in the discourse of the text.

This last step would help the learner to achieve the semantic representation of the **target-language text**.

Unquestionably, these procedural steps **(tasks)**, if done properly (decoding the English text and encoding it into Arabic), is supposed to serve in achieving objective No, 1, mentioned above in (7-1-2).

Furthermore, and if arguing for the sake of achieving objective No.2 in (7-1-2), for **Group A**; a back-translation (retranslating the resultant Arabic text into English) is made in the classroom, and for **Group B**, the student is advised, as soon as he accomplishes translating the text, to make verifiable and justifiable back-translation, as part of the assignment and as a feed-back step. If this feed-back step realizes (whether in the classroom or at home) an acceptable degree of **correspondence between** the **English source-language text** and the **English feed-back text**, this would grant validity to the **Arabic target text.**

**8- Application of the Experiment and the Test**

Whether for **Group A** (in the classroom) or for **Group B** (at home), the procedures were effectively built on the principles of a **student-centered teaching method**, in which the learners are supposed to have a major and active role in the learning/teaching process; by letting them take the initiative to have more control over what they learn and how. This,

5

consequently, may encourage them to take more responsibility for their own learning (Richard and Schmidt 2002).

**8-1 Steps of the Experiment**
**8-1-1 Step No. 1**
**Week 1: Theoretical Discussions for Both Groups**
**Firstly**, the experiment started during the first week of Oct. 2008 within the first semester primarily with discussing the theoretical principles of translation needed for this experiment, by refreshing the students' memory of the basic structures of the two languages in question, English and Arabic, and the contrastive points between them as well.

Building on the fact that the learners have had a long period of exposure to both languages they are dealing with, refreshing their memory was achieved by holding discussions, between the teacher and the students. This was done via a process lasted for four lessons, **in which the students defined and specified the general basic (non-detailed) structural and cultural differences between English and Arabic**, and wrote down whatever they thought to be as guidance at hand.

Such discussions, on the other hand, had to make stop at the characteristics of a good translator, which, as far as they have to do with the learners' current normal level of language command, could be briefed as follows:

- Have relatively a good command over the basics of the two languages,
- Be aware enough of the basic cultural variations of the two languages,
- Have a good sense of selecting the proper sense of a word or expression meaning, due to the context of the text message,
- Be equipped well-enough with the tools that facilitate the translating process, i.e., at least three types of dictionaries for the moment; an English-Arabic one, an English-English one, and an Arabic-English one.

**Secondly**, and very importantly, the learners were told in advance that they had been chosen as a sample of population for a new experiment in translation, by enlightening them about the principles of the **Teacher-directed Approach** plus **Student-centered Teaching Approach (for Group A)**, and the **Task-oriented Approach** plus **Learner-centered Teaching Approach (for Group B)**, which both aim at the manifestation of the students' talents, not the teacher's, in translation. The difference between the two approaches here is obvious; with Group A, it is controlled by the teacher, whereas with Group B is not.

As a matter of fact, making the students aware of their role in the experiment was hoped to energize their motivation to a higher degree of participation.

Furthermore, they were also told about the model adopted in the experiment, and the way it could be rendered into series of tasks, mixed of physical and mental processes (see 7-3 above)

**8-1-2 Step No.2:**
**Week 2: Pre-Test**
In order to find out whether, or not, the two groups, **A** & **B** have the equal variances, a pre-test was carried out to examine the equivalence between the two groups. The following statistic results were obtained from the t-test:

**Table (2):** Group Statistics

| Group | N | Mean | Std. Deviation |
|---|---|---|---|
| Group A | 60 | 6.6083 | 1.9422 |
| Group B | 60 | 6.8750 | 1.6407 |

**Table (3):** Independent Sample Test

| | t-test for Equality of Means | | |
|---|---|---|---|
| | t | df | Sig.(2-tailed |
| VAR00002 Equal variances assumed | -812 | 118 | 418 |

Thus, the results of the t-test, given in Tables 2 & 3 above, have approved the equivalence of the means related to the two groups, and at the same time; this justified the grounds of carrying out the experiment. This is, because the difference in the standard deviation between the 2 groups showed that the variances of the 2 groups are almost equal.

**8-1-3 Step N0. 3: The Teaching Process**
For both groups, **A** (**in the classroom**) and **B** (**at home**), the students were asked, when translating all the passages given to them at the same time, to concentrate on the following:
- Communicating the general meaning,
- Paying attention to sentence building, and
- Identifying and solving the problematic points, specified by the text-book.

The materials of the lessons were all chosen from '***Advanced English for Translation'***, afore-mentioned to cover the following 8-weeks-students- performance in figuring out strategies

to solve the problems they face when translating the critical-points attached to the passages. No doubt, the texts have been chosen by the authors of **Advanced English for Translation'** on the basis that they semantically demonstrate certain problematic points even to the English native speakers in translation, who may miss the sought sense of the word in the said text. Most significantly, "To provide practice in those areas of English which are known to cause difficulty to foreign learners." (Chamberlin & White 1993 p.2)

**Week 3**:

A passage[1] from the novel **'The Spy who came from the cold'** by John Le Carre, (cited in Chamberlin, Dennis & White, Gillian-1993 p.10) with the following problematic items in translation:
- The use of 'by' in time expressions,
- Past perfect continuous tense,
- Idioms with 'to/into',
- Double comparatives, and
- The modal verb 'might'.

**Week 4:**

A passage[1] of **trade correspondence** (cited in Chamberlin, Dennis & White, Gillian-1993 p.15)**,** with the following problematic items:
- Present simple/ present continuous,
- Take/ bring/ fetch,
- Present continuous tense expressing future,
- Phrasal verb- to see, and
- Idiomatic expressions with 's

**Week 5:**

A passage[2] about shopping from **'The Consumer Jungle'** by Marion Giordano, (cited in Chamberlin, Dennis & White, Gillian-1993 p.20) with the following problematic items:
- Plural nouns,
- Adjectives in –ing & -ed,
- The word 'one',
- Arise/ raise/ rise, and
- The modal 'may'.

**Week 6:**

A science-fiction passage[3] from **'James and the Giant peach'** by Ronald Dahl (cited in Chamberlin, Dennis & White, Gillian-1993 p.25), with the following problematic items:
- The word 'Quite',
- To keep (on) + -ing,
- The word 'very',
- As if/ as though, and
- Result clauses.

**Week 7:**

The passage[4], *Repairing a Fuse*, from *The Good Handyman's Encyclopedia*, by F. J. Christopher and Rosemary Christopher (cited in Chamberlin, Dennis & White, Gillian-1993 p.30), with the following problematic items:
- The modal verb 'should'
- To loosen/ loose/ to lose
- It+ to be+ adjective+ infinitive
- The word 'only'

**Week 8**:

*A trade correspondence letter from a company to a purchaser*[5] (cited in Chamberlin, Dennis & White, Gillian-1993 p.35), with the following problematic items:
- Phrasal verbs – to run
- Stative verbs
- Do- pro form
- Conditionals
- Prepositions of final position

**Week 9:**

The passage[6], *Wanted, five enterprising people to challenging project*, *a Rolex of Geneva* (cited in Chamberlin, Dennis & White, Gillian-1993 p.40), advertisement from the *Time Magazine*, with the following problematic items:
- Compound nouns with 'break'
- Adverbials with present perfect
- Future passive
- -ing clauses
- Opportunity/ chance/ occasion/ possibility

**Week 10:**

A passage[7] from the novel, *Bonecrack*, by Dick Fransic (cited in Chamberlin, Dennis & White, Gillian-1993 p.45), with the following problematic items:
- The word 'both'
- Compound adjectives
- The word 'there'
- Order of adjectives

Furthermore, keeping pace with the design of the experiment, for both groups, was allotted to do the exercises supplemented at the end of each passage. As for the **second-hour**, for **Group A** it was allotted to translate the passage in the classroom; and for **Group B**, it was allotted to making discussions in the classroom for better style, via comparisons held between the learners' performances. Such discussions were carried out in the classroom by the students themselves, with the guidance of the teacher.

7

**8-1-4 Step No. 3: Achievement Test**
**Week 11: Achievement test**

In order to measure the ability, knowledge, and performance of the learners as (Richard and Schmidt 2002) argue, during week 11, a test of achievement was brought out. Doubtless, here, in order to meet the belief that " . . . a test is not only a means of measurement, but also an instrument of learning," (Richard and Schmidt 2002) the **test-construction** was deliberately designed according to:

**1- Test construction**: The test is constructed to measure the learners' ability to work on their own in translation **via an unseen passage**.

**2- Test Items**: The test was constructed from only one question, (see Appendix 1), selected out, not among of the passages which were given to students in assignments or discussed at the classroom, but rather an **unseen passage**, selected from the same course-book which was taught to them; *Advanced English for Translation*

**3- Test objectives**: The an unseen passage given in the test was in order to realize the following objectives:

- **General**: To find out the students ability to identify the unfamiliar problematic points and the strategies they used to solve them.

- **Specific**: To use the results of the two groups to make comparison, in order to find out any statistically significant differences in the results of the students as an outcome of adopting the **'task-oriented approach'** in TT

**4- Test Validity**:

It is the test itself that fulfils its objectives (Ibrahim, 1989: 72). Validity is a psychometric value which reveals the range of achieving a goal (Awda, 1999: 13). The researcher found out logical validity of both types; surface and content validity, via presenting the initial form of the test to a group of experts[8] to assess the validity of the items. This is, because the opinion of the experts is an indicator of **surface validity**, since surface validity is reached through the experts' opinion about the quality of the test in measuring the characteristics (Awda, 1999: 370). The researcher also **verified the content validity** by drawing a test map so that the items will represent the content of the material and the behavioral aims, because content validity depends on the ration of representing the content of the material in the test items and representing the teaching aims (Al-Rosan et al, 1995: 90).

**5- The Score Scheme**: The score marks were **out of ten (…/10)**, divided as follows:

- 2/10 for the general meaning,
- 2/10 for sentence building, and
- 6/10 for solving the problematic points.
-

**6- Final Administration**: One of the translation's two-hours-weekly was allotted for the test administration. The two groups, **A** & **B** of test-takers were tested at the same time.

**7- Duration of the test**: 90 minutes.

**Table (4):** Achievement Test Scores of Group A(Number of Test-takers: 60)

| Group A Scores for 60 test-takers | | | |
|---|---|---|---|
| 9.5 | 6.5 | 7 | 6 |
| 8.5 | 6 | 8 | 6 |
| 6.5 | 4 | 4 | 7 |
| 7 | 4 | 9 | 5 |
| 5 | 8.5 | 4 | 4 |
| 7.5 | 6.5 | 3 | 6.5 |
| 2 | 2 | 6 | 9 |
| 6 | 5 | 3 | 4 |
| 7 | 5 | 7.5 | 8.5 |
| 5 | 9 | 5 | 4 |
| 4 | 9.5 | 8.5 | 5 |
| 5 | 7.5 | 4 | 3 |
| 7 | 9 | 5 | 4 |
| 7 | 4 | 8.5 | 1.5 |
| 5 | 6 | 3 | 3.5 |

**Table (5): Achievement Test Scores of Group B(Number of Test-takers: 60)**

| Group B Scores for 60 test-takers | | | |
|---|---|---|---|
| 9 | 6.5 | 3 | 8 |
| 8.5 | 6.5 | 6.5 | 5.5 |
| 8.5 | 9 | 6.5 | 7 |
| 6.5 | 5.5 | 7.5 | 6.5 |
| 8.5 | 8.5 | 9 | 5 |
| 5 | 5.5 | 3 | 8.5 |
| 6 | 9.5 | 6 | 3 |
| 8 | 7.5 | 7 | 4 |
| 6.5 | 6.5 | 6 | 9 |
| 7 | 6 | 9 | 5 |
| 7.5 | 6 | 5.5 | 6 |
| 7.5 | 9 | 9.5 | 8.5 |
| 8.5 | 9 | 3 | 6 |
| 9.5 | 9 | 6.5 | 9 |
| 6.5 | 5 | 8.5 | 6 |

**8- Statistical Methods:**

The immediate surface results of the students' achievement test have shown that:

- From **Group A**, following the **'teacher-directed approach'**, 42 out of 60 students passed the exam successfully, and

- From **Group B**, following the **'task-oriented approach'**, 55 out of 60 students passed the exam successfully.

It is obvious that the number of those students who passed the exam is **in favor of Group B**, in other words, in favor of the **'task-oriented approach'**.

Furthermore, at the deep level, the results of the t-test have shown the following statistic values:

**Table (6):** Achievement-test Results of Group A

| Group | No. | Scoring Average | Stand. deviation |
|-------|-----|-----------------|------------------|
| A | 60 | 5.783 | 2.0797 |

**Table (7):** Achievement-test Results of Group B

| Group | No. | Scoring Average | Stand. deviation |
|-------|-----|-----------------|------------------|
| B | 60 | 6.925 | 1.765 |

**Table (8):** Comparison between the Results of Group A & Group B in the Achievement-test

| Group | No. | Scoring Average | Stand. Deviation | t-value | Freedom point | significance |
|-------|-----|-----------------|------------------|---------|---------------|--------------|
| A | 60 | 5.783 | 2.0797 | -2.242 | 118 | 0.002 |
| B | 60 | 6.925 | 1.765 | | | |

Any comparison between the achievement-test results of the **2 groups**, as it is manifested in Table No.8, can show a difference in the results of the **2 groups**. More significant is the fact that the students' results, analyzed by experts in statistics, have proved a significant statistical difference in the in favor of **Group B** achievements, which can be attributed to the new approach; namely the **'task-oriented approach'**, used in TT.

**8-1-4 Step No. 5: Test Reliability**

Analyzing samples from the achievement test results have shown that the test can provide a reasonable degree of consistency in results. And the correlations, which are given in **Table No. 8**, manifest clearly that the significance of correlation is at 0.01 levels. This, furthermore, means that the test, if administratively repeated, can most likely manifest almost the same results.

**Table (9):** Correlations

| | VAR00004 | VAR00005 |
|---|----------|----------|
| VAR00004 Pearson Correlation Sig. (2-tailed) N | 1.000<br><br>20 | .807**<br>.000<br>20 |
| VAR00005 Pearson Correlation Sig. (2-tailed) N | .807**<br>.000<br>20 | 1.000<br><br>20 |

**correlation is significant at the 0.01 levels (2-tailed)

**9- Conclusions**

To conclude, using certain recent cognitive approaches in TT could be justified on three grounds, namely, psychological, pedagogical, and statistical grounds:

- On psychological grounds, the use of the cognitive approach enables the students to be self-confident enough to use their competence in finding their own strategies to solve the problems encountered in translating a text.

- On pedagogical grounds, beside offering the opportunity to the teacher to identify the mentally-skilled students in translation, the use of the cognitive approach may help the teacher,

9

on the one hand, to save time and discuss more additional matters related to the translating process, and on the other, to provide some different materials and leave the students to experiment.

- On statistical grounds, the experiment has shown a statistically significant difference in favor of using the cognitive Approach in TT.

**10- Suggestions**

The carrying out of this study has experimentally and statistically proved that using certain recent cognitive approaches in TT could be of a great help to improve the students' achievement. So the following suggestions could be of use in this respect:

1- To carry out similar studies to verify the efficiency of using the said cognitive approaches in teaching other materials.

2- Providing the translation teachers, in the academic institutions, with the latest cognitive approaches in teaching via training courses.

**Notes:**

[1] All the passages (including problematic points indicated for translation) adopted for the experiment syllabus were selected from (Chamberlin, Dennis & White, Gillian-1993)

[2] Ibid p.20

[3] Ibid p.25

[4] Ibid p.30

[5] Ibid p.35

[6] Ibid p.40

[7] Ibid p. 45

[8] (the names of the jury members are listed in Appendix No. 2)

[9] The examinees were allowed to take dictionaries with them to the examination hall, on the ground of that the examination is of translation, not of reading comprehension.

**References**

- Al-Rosan, Salim Salama et al (1995) *Principles of Measurement and Evaluation and Its Educational and Humantarian Applications*. Amman: Cooperation Publishing Society
- Awda, Ahmed Sulaiman (1999) *Measurement and Evaluation in Teaching*. Irbid: Dar Al-Amel
- Bell, T. Roger (1991), *Translation and Translating*. Longman. London.
- Butts, J. Eugene (1974) *Student-Centered, Teacher-Directed Learning Approach.* Business Education Forum . London
-

- Chamberlin, Dennis & White, Gillian (1993) *Advanced English for Translation*, Cambridge University press. England.
- Crystal. David (2007) *How Language Works.* Penguin Books. Cambrighe University Pres.
- Dickinson, L. (1988). *Self-Instruction in Language Learning*. Cambridge. Cambridge University Press.
- Grookes, G and Gass, S. M. (1993a) *Tasks and Language Learning: Integrating Theory and Practice*. Clevedon: Multilingual matters
- Hughes, A. (1999) *Testing for Language Teachers*. Cambridge. Cambridge University Press.
- Ibrahim, Amir, et al. (1989) *Principles of Measurement and Evaluation in Education*, Amman: Dar Amman (in Arabic)
- Johnson, Keith & Johnson, Helen (1999) *Encyclopedic Dictionary of Applied Linguistic*. Edited. Blackwell Publishers. USA.
- Larson, Mildred L. (1984) *Meaning-based Translation: A Guide to Cross-language Equivalence*. University Press of America. Lanam. New York. London.
- Nunan, D. (1989) *Designing Tasks for the Communicative Classroom*. Cambridge. Cambridge University Press.
- Parbhu, N. S. (1987) *Second language Pedagogy: A Perspective.* Oxford. Oxford University Press.
- Sheerin, S. (1989). *Self-access*. Oxford. Oxford University Press.
- Richards, C. Jack & Schmidt, Richard (2002) *Dictionary of Language & Applied Linguistics*. Pearson Education Limited. Longman. England.
- Vandalin, Deabold B. (1985) *Approaches of Research in Educatin and Psychology*, translated by Mohammad Nabil et al., 3rd Cairo: Anglo-Egyptian Library.

## Appendix (1)

### Achievement Test Construction

**Q.0: Taking into account:**

- **the general meaning of the passage,**
- **the sentences' structure (Arabic sentence structure), and**
- **giving as exact as possible the sense of the expression which acceptably goes with context of the texts[9] (consulting the dictionary is allowed) of the problematic and confusing points in the sentences written in italics, translate the following passage into Arabic**:

*It was quite a large hole*, the sort of thing an animal about the size of a fox might have made.

James knelt down in front of it, and *poked his head and shoulders inside*.
He crawled in.
He kept on crawling.
*This isn't a hole*, he thought excitedly. *It's a tunnel!*
The tunnel was damp and murky, and all around him there was the curious bittersweet smell of fresh peach. The floor was soggy under his knees, the walls were wet and sticky, and peach juice was dripping from the ceiling. James opened his mouth and caught some of it on his tongue. It tasted delicious.

He was crawling uphill now, as though *the **tunnel were leading straight towards the very centre of gigantic fruit***. Every few seconds he paused and took a bite out of the wall. The peach flesh was sweet and juicy, and marvelously refreshing.

He crawled on for several more yards, and then suddenly- *bang*- the top of his head bumped into something extremely hard blocking his way. He glanced up. In front of him *there was a solid wall that seemed at first as though it were made of wood*. He touched it with his fingers. It certainly felt like wood, except that it was very jagged and full of deep grooves.

'Good heavens!' he said. 'I know what this is! I've come to the stone in the middle of the peach!'

Then he noticed that there was a small door cut into the face of the peach stone. He gave a push. It swung open. He crawled through it, and before he had time to glance up and see where he was, he heard a voice saying, '*Look* who's here! And another one said, 'We've been *waiting* for you!'

James stopped and stared at the speakers, his face white with horror. He started to stand up, but *his knees were shaking so much he had to sit down again on the floor*.

From ***James and the giant peach*** by Roald Dahl

## Appendix (2)

### The Jury Members' Names

1- DR. Ali Hussein (Assist. Prof.) college of Education/University of Mosul.
2- Dr. Chachan Jum'ah (Assist. Prof.) School of Basic Education/ University of Duhok-Kirdistan Region-Iraq.
3- Dr. Bushra Noori Al-Sa'doon (Assist Prof.) College of Education/ Ebe University/ Yamen.
4- Dr. Safa' Isa (Assist. Prof.)/ The College of Basic education/ University of Meesan/ Iraq.
5- Dr. 'Asim 'Abood (Assist. Prof.)/ The College of Basic education/ University of Babil/ Iraq.
6- Dr. Abdul Hameed Naseer (Assist. Prof.)/ College of Languages/ University of Baghdad.
7- Dr. Khalil Isma'eel (Assist. Prof.)/College of Education/ University of Diyala.
8- Dr. Ayad Hameed (Assist. Prof.)/College of Education/ University of Diyala.
9- Miss Lamyaa Rasheed (Assist. Prof.)/College of Education/ University of Diyala.

<div dir="rtl">

## أثر إستعمال الطريقة الإدراكية في إنجاز طلبة قسم اللغة الإنكليزية في درس الترجمة

**الملخص:**

أجري هذا البحث الميداني التجريبي عام ٢٠١٠ ابتداء من بداية شهر تشرين الأول و دام ثلاثة شهور (١١-١٢ أسبوعا).

افترض الباحث فيه بأن اتباع أسلوب حديث يستند على مبادئ معرفية و ادراكية في تدريس الترجمة قد لا يشكل فرقا أساسيا في انجاز الطلبة.

و أختير فيه طلبة قسم اللغة الانكليزية/ كلية اللغات/ جامعة بغداد، ليكونوا مجتمعا لهذا البحث. و تبعا لذلك تم اختيار طلبة المرحلة الثانية للعام الدراسي ٢٠٠٩/٢٠١٠ عينة محددة للبحث.

قسم الباحث العينة المتكونة من (١٢٠) طالبا الى مجموعتين:

- المجموعة أ (٦٠ طالبا)، و
- المجموعة ب (٦٠ طالبا).

اتبع الباحث مع المجموعة أ طريقة لتعليم الترجمة تسمى بلغة علم اللغة التطبيقي بـ "Teacher–controlled Approach" "الطريقة الموجهة"، و تمنح هذه الطريقة المدرس دورا يطغى كثيرا على دور الطالب في عملية التعلم/التعليم، اذ يقوم المدرس بدور رئيس في تشخيص الصعوبات الترجمية في النص و ايجاد الوسائل للتغلب عليها داخل الصف و و يدعو الطلبة بقيادته الى حل المعضلات الترجمية.

و استعمل، من ناحية أخرى، مع المجموعة ب، طريقة مغايرة حديثة تسمى  "Task–oriented Approach"، و هي طريقة مشتقة مما يسمى اصطلاحا في علم اللغة التطبيقي بـ "task–based teaching طريقة المهام الموجهة"، و تستند هذه الطريقة أساسا على دور للطالب أكبر بكثير من الدور الذي يقوم به المدرس في عملية التعلم/التعليم، بأن يكلف الطلبة بترجمة نص معين، يأخذون فيه على عاتقهم (واجبا بيتيا و دون توجيه من المدرس) مهمة تشخيص الصعوبات الترجمية في النص، و إيجاد الوسائل للتغلب عليها بأنفسهم. ثم يأتون بانجازهم فيما بعد لمناقشته مع المدرس و الطلبة الآخرين في الصف.

و قبل الشروع بخطوات التجربة، قام الباحث بالخطوة التجريبية الأولى لتسويغ تقسيم العينة الى مجموعتين، و هي اجراء امتحان لاختبار المكافئات الفردية للطلبة بين المجموعتين، فجاءت النتيجة بتساوي المجموعتين بخواصهما كعينة للبحث.

و أعطيت العينة، بمجموعتيها، في الأسبوعين الأولين، بمعدل ٤ وحدات تدريسية، معلومات نظرية عامة عن الترجمة و احتياجاتها، و من هو المترجم الجيد. ثم شرع بعدها بتطبيق طريقتي التدريس المذكورتين في أعلاه كلا على حدة مع إحدى  المجموعتين.

و قد أختير كتاب "Advanced English for Translation" مقررا عمليا لدريس الترجمة لكلا المجموعتين. و هكذا أعطيت المجموعتان الدروس ذاتها، كتدريب في الترجمة، لمدة ثمانية اسابيع متتالية.

ثم تبع ذلك تصميم امتحان للانجاز ، كانت مادة الامتحان فيه "قطعة غير منظورة unseen passage" (ليست من ضمن النصوص الترجمية التي تدرب الطلبة على ترجمتها أثناء مدة التدريب). و عرضت مادة الامتحان على الخبراء لقياس صدقيتها و موثوقيتها، فتأيد ذلك. ثم أجري امتحان الانجاز.

- كانت النتائج الأفقية للامتحان لصالح المجموعة ب، و كالآتي:
- المجموعة ب (التي أتبعت معها الطريقة الجديدة في تدريس الترجمة)، نجح فيها ٥٥ طالبا اجتازوا الامتحان من مجموع ٦٠،
- المجموعة أ (المجموعة التي اتبعت معها الطريقة التقليدية في تدريس الترجمة) اجتاز فيها الامتحان ٤٢ طالبا فقط من مجموع ٦٠ .
- أما النتائج العمودية للامتحان فكانت هي الأخرى لصالح المجموعة ب، اذ بعد عرض درجات الطلبة على المختصين بالقياس و التقويم، فقد أظهرت تلك الأرقام و المعادلات فرقا لصالح الطريقة الجديدة يثبت جدواها للطلبة و لعملية التعليم /التعلم، و هي نتائج تساعد على الوصول الى استنتاجات على ثلاث مستويات:
- مستوى سايكولوجي: وفحواه ذو شقين؛ شق يبين ان استعمال الطرق الادراكية الجديدة في تدريس الترجمة يهئ للطلبة امكانية استعمال مهاراتهم الادراكية في تشخيص المشكلات التي تواجههم عند الترجمة و محاولة ايجاد حلول لهذه المشكلات، و شق آخر يبين امكانية تحويل عملة الترجمة عند الطالب الى عملية ابداعية.
- مستوى له علاقة بعملية التدريس: و فحواه ان استعمال الطرق الادراكية الحديثة في تدريس الترجمة، أن تأثيره، اضافة الى تمكين المدرس من اكتشاف قابليات طلابه المبدعين في درس الترجمة، قد يمتد الى توفير الوقت الكافي له لامداد طلبته بأكبر قدر ممكن من التجارب الترجمية، طالما كان الطلبة يقومون بمهام الترجمة بأنفسهم.
- مستوى إحصائي: و فحواه، ان استعمال الطرق الادراكية الحديثة في تدريس الترجمة، قد أظهر بدلائل صادقة يمكن التعويل عليها جدواه في امكانية تطوير قابليات الطلبة في درس الترجمة.

</div>

# *OTHELLO:* DELINEATING IDENTITY THROUGH TWO POSTCOLONIAL CONCEPTS MIMICRY AND HYBRIDITY

**A**mel **M**ahmoud

English Dept., Faculty of Humanities, University of Zakho, Kurdistan Region – Iraq.

## The Abstract

The present research deals with two post-colonial concepts 'mimicry' and 'hybridity' in the Shakespearean tragedy *Othello* as they are treated by the postcolonial critic Homi Bhabha. The research attempts to show how Othello while affirming his identity as an African hero ironically employs the Renaissance's discourse about the inferiority of the black race and the superiority of the white race. Therefore, he stands to represents the 'mimic man' whose access to his origin becomes the exotic ascriptions of the European colonial discourse. Furthermore, the research investigates the cultural and historical reasons behind seeing in Othello's act of marrying Desdemona an act of 'miscegenation' that must be punished by death. For the Sixteenth century Europe, this black hero has reversed the rule upon which the whole social and economic structures are based on which is the superiority of the white race and the subjection of the black race. This reversion has led to a kind of 'hybrid' union that is totally refused by the Sixteenth century Europe.

*Othello:* Delineating Identity through Two Postcolonial Concepts Mimicry and Hybridity

The present essay examines two post-colonial concepts 'mimicry' and 'hybridity' in the Shakespearean tragedy *Othello* as they are discussed and examined by the postcolonial critic Homi Bhabha. In "Of Mimicry and Man: The Ambivalence of Colonial Discourse", Bhabha defines mimicry as 'the desire for a reformed recognizable other, as the subject of difference that is almost the same, but not quite. The discourse of mimicry is constructed around ambivalence. In order to be effective, mimicry must continuously produce its slippage, its excess, its difference. Thus, mimicry is a sign of double articulation, a complex strategy of reform, regulation and discipline, which 'appropriate' the 'other' as it visualizes power (Bhabha, 1984).

T.B Macaulay conceives the [colonized] others as 'a class of interpreters between [the colonizer] and the millions whom we govern, a class of persons Indian in blood and colour, but English in tastes, in opinions, in morals and in intellect' (Macaulay, 1985). Thus mimicry becomes like a technique of camouflage, a form of resemblance that differs/defends presence by displaying it in part. It's a partial presence because it is 'incomplete' and virtual'(Bhabha, 1984) and owing to these features it liberates marginal elements and, simultaneously, shatters the unity of man's being through which he extends his sovereignty (Foucault, 1977).

Concerning the second concept 'hybridity', it refers to the integration or mingling of the cultural practices, codes and traditions of the colonizer and the colonized. The assimilation and adaptation of cultural practices and the cross-fertilization of cultures can be positive and enriching, but it can also be oppressive and destructive. For Bhabha, 'hybridity' is the process by which the colonial authority undertakes to translate the identity of the colonized the 'Other' within a singular universal framework, but then fails producing something familiar and new (Papastergiadis, 1997).

Bhabha contends that a new hybrid identity emerges from the interweaving of elements of the two races challenging the validity and authenticity of any essentialist cultural identity. The reason is permanently owing to the dichotomous category of 'us/them'(Meredith, 1998) which follows the mechanism of exclusion and purity that are based on considerations of race, gender, class, geographical locale and sexual orientation. In the present essay, the discussion on 'hybridity' is centred on the fear of 'miscegenation' which refers to the interracial marriage and the offspring produced by parents who are of different races, especially when one parent is white.

In the play under scrutiny, the first appearance of Othello portrays a splendid entrance marked with a profound self-assurance. Othello appears confident of his bravery, soldiery skills and

nobility calmly responding to Iago's account of Brabantio's fury:

My services which I have done the signiory
Shall out-tongue his complaints. 'Tis yet to know,--
Which, when I know that boasting is an honour,
I shall promulgate--I fetch my life and being
From men of royal siege, and my demerits
May speak unbonneted to as proud a fortune. (I, ii, p. 16)

In this scene and while Iago invokes the noble class of Brabantio, Othello asserts the fact that he is of not less noble blood 'being from men of royal siege'. However, when Othello stands before the Duke of Venice and the senators defending his marriage, he pictures himself in a quiet different context portraying exotic tales of bloody battles, the cannibals who eat each other and men whose heads grew beneath their shoulders:

Her father loved me, oft invited me,
Still questiond me the story of my life[...]
Wherein I spake of most disastrous chances[...]
Of being taken by the insolent foe,
And sold to slavery [...]
And of the Cannibals that each other eat,
The Anthropophagi and men whose heads
Do grow beneath their shoulders.  (I, iii, p 28)

In this speech and as Othello is unfolding his autobiographical account, he produces his identity as a black man within a configuration of familiar signifiers, familiar to the Europeans: slaves, and 'Cannibals'. When Desdemona responds with tears for the dangers he encountered, she demonstrates her love to him as a fictional character of those exotic narratives (Singh, 1994).
 According to Stephen Greenblatt, Othello's identity depends 'upon a constant performance [...] of his history, a loss of his origins, an embrace of the norms of another culture' (Greenblatt, 1980). Othello's telling of his autobiography is an instance of the 'tamed difference'. In order to become a civil character, he has to reproduce the most familiar images of European travel narratives and colonial discourse when dealing with Africa. In Othello's narratives, we don't hear about the nobility, civility and hospitality of Africa. Africa in Othello's word, like in the words of any other western traveller, is a land of mysteries and adventures populated by the cannibals and men whose heads grow beneath their shoulders (Calvo, 1996). In this scene, Othello learns his place as an alien in the European society. The African character who is of a noble origin turns into an incarnation of the stereotypes, a marginal figure and a cursed slave.

Thus, while Othello is employing the Renaissance's discourse, he submits, as Greenblatt views him, to the narrative and self-fashioning of the age. Hence, his own access to his origin becomes the exotic ascriptions of the European colonial discourse. His tales don't add anything new about Africa and in this way reassure the familiar images.

In this manner, Othello becomes the 'mimic-man' who has been converted to Christianity, learned the white man's language and absorbed the world vision expressed in this language. To speak Venetian language is to take a world vision and culture. M. R. Ridley argues that Othello is not a 'veritable negro', a figure unworthy of tragedy, a character who seems more as a 'sub-human', rather a black who appears white and perhaps represents the most renewed form of western tradition (Newman,1994).

According to Bhabha, the Africans who mediate between the imperial authority and the native subjects were in certain ways to become 'English', and yet, according to Bhabha, the creation of these mock Englishmen was also troubling because 'mimicry is at once a resemblance and a menace (Young, 1990).

Mimicry is the point of the split between identity and the difference that Africans have struggled to negotiate their identities through colonial/postcolonial history (Singh,1994). According to postcolonial theories, pressures on the black man to imitate the white man produce a pathological self-alienation (Singh,1994). Hence, 'mimicry' becomes a condition of the native's divided subjectivity, self-alienation and self-contradiction. This contradiction is evident in Othello's response to Iago's warnings against the 'the green-eyed monster':

Think'st thou I'd make a lie of jealousy,
To follow still the changes of the moon
With fresh suspicions? No; to be once in doubt
Is once to be resolved: exchange me for a goat,
When I shall turn the business of my soul
To such exsufflicate and blown surmises (III,iii,104)

In this speech, Othello asserts to Iago that he will not be fluctuating with doubts and suspicions following 'the changes of moon'. The speech depicts him as a 'civilized' native who would resort to judgment after gradual accumulation of relevant facts. However, and as Iago takes his leave, the turmoil of jealousy and suspicion bursts inside the Moor as he speculates his vengeful reaction to his bride's infidelity swiftly bestowing his judgment:
She's gone. I am abused; and my relief

Must be to loathe her. O curse of marriage,
That we can call these delicate creatures ours,
And not their appetites (III,iii,109)

These contradictions in the building materials of the 'mimic-man' are stressed again at the end of the
play, Othello perpetuates the dichotomy between the 'civilized' Venetians and the 'barbaric' (Singh, 1994) when he characterizes himself as the 'base Judean' and on stabbing himself 'I took by the throat the circumcised dog'. (V, ii, 196)
Iago's language whose insinuations are never irrelevant to Othello's thinking, implicitly reminding Othello of his skin colour which marks him off as an outsider and wheeling stranger. This feeling of being an outsider enables Iago to successfully proceed with his plot since the latter possesses what can be defined as the discourse of knowledge, being the white Elizabethan. A telling instance is caught in the scene when Iago warns Othello of the fact that the latter is totally ignorant of the customary morality of the Venetian women:

I know our country disposition well;
In Venice they do let heaven see the pranks
They dare not show their husbands; their best conscience
Is not to leave't undone, but keep't unknown.(III,iii,105)

Othello recognises his being an outsider to the sophisticated state of Venice even earlier. In the scene when he defends himself before the Duke of Venice, he discloses:

And little of the great world can I speak,
More than pertain to feats of broil and battle,
And therefore little shall I grace my cause' (I, iii, 26)

Being an outsider is much related to the race Othello belongs to and the implications of his skin colour. For some critics like Samuel Taylor Coleridge, Othello the Moor is quiet unfit as the protagonist of the play since blackness was an equivalence of savagery and the notion of savage heroism is an oxymoron. His argument about race in *Othello* has almost been entangled with arguments about culture in which gradations of colour stand for gradations of barbarity and primitive emotion (Neill, 1989).
A.C. Bradley examines another dimension in the personality of Othello, this time the uncontrolled feeling of jealousy which is again connected with his race. Bradley clarifies that feelings and emotions excite the Moor's imagination, simultaneously, confuse and dull his intellects particularly his feeling of jealousy which is, for Bradley, the main source of danger in this character (Bradley, 1905).
Eldred Jones in *The Elizabethan Image of Africa* (1971) argues that jealousy with its monstrous connotations is firmly connected with the African race. To this race, this self-begotten monster of appetite emerges as an extreme corrupted and 'adulterate' form of sexual excitement. Jones affirms 'for the reason of jealousy you may see them [the Africans] daily one to be the death and destruction of another, and that in such savage and brutish manner that in this case they will show no compassion at all' (Jones, 1971).
In the Elizabethan popular imagination, the association of the African race with the monsters supposed to inhabit their continent made it easy for blackness to be imagined as a symptom of the monstrous (Newman, 1994). The combinations of blackness, jealousy and monstrosity constitute a threat to the European race which dreads the 'infection of blackness'(Calvo,1996). with all its implications of inferiority and disproportion. Therefore, any union between the monstrosity and the civilized race is conceived to be quite literary a kind of adulteration, the pollution or the corruption of the divinely ordained bond of marriage and in the profoundest sense, a violation of the natural order of things (Neill, 1989)
Karen Newman in 'And wash the Ethiop White': Femininity and the Monstrous in *Othello* illustrates that much of the repulsion critics demonstrate towards Othello springs not out of his blackness but from the connection of that blackness to the purity and whiteness of Desdemona which amply seen as unnatural. This

conception is evidently caught in the rhetoric of Brabantio:

To fall in love with what she fear'd to look on?
…Against all rules of nature, and must be driven
To find out practices of cunning hell (I, ii, 27)

This understanding drives critics like Charles Lam to see 'something extremely revolting in the courtship and wedded caresses of Othello and Desdemona' (Singh, 1994) The love of Othello and Desdemona is presented as a radical assault on the whole system of differences from which the Jacobean world was constructed.

In the morality plays of the medieval ages and later of the thirteen century, the devil or the concept of 'evil' is allegorically represented as a black man. During the Elizabethan period, black was seen as a colour which denoted sharp opposition, it entailed a variety of connotations such as dirty, foul or having a malicious purpose, involving death, horrible or wicked.

This prejudice against the black in the Elizabethan and Jacobean culture, the link between blackness and the devil, the myth of black sexuality and the problem of black subjection to authority are embedded in the fear of 'miscegenation' (Newman, 1994). or racial transgression.

The English race held the belief that the black man had the power to subjugate his partner's whiteness, to make both his 'victim' and her offspring resemble him, to make them both black, a literal blackness in the case of a child, a metaphoric in the case of a sexual partner.

Travel narratives of the sixteenth century display the intersection of ancient legends and myths about the black Africa with contemporary experience, observation and prejudice. George Best in *Discourse* (1578) expresses the fears of the mingling of the two races, of the contaminated outcome of such a mixture:

I myself have seen an Ethiopian as Black as a cole brought into England, who taking a fair English woman to wife, begat a sonne in all respect as blacke as the father was, although England were his native country, and an English woman his mother: whereby it seemeth this blackness proceedeth rather of some natural infection of that man, which was so strong, that neither the nature of the Clime, neither the good complexion of the mother concurring coulde anything alter (Hakluyt, 1904).

In his argument, Best illustrates Queen Elizabeth's reaction to the increasing number of Africans in the towns and cities in England. The Queen licensed Casper van Senden to take a good number of those Moors from England and to transport them to Spain and Portugal (Newman, 1994). The Queen's decision to expel the Africans unveils the hidden fear of the 'infection of blackness'(Calvo, 1996) which is considered as the main cause of the lowering of the physical and mental levels of humans through the association between blackness and monstrosity.

These historical incidents highlights the social changes taking place in Elizabethan England of 'masterless men' which challenge the traditional notions of order and degree and came at a time when 'elite identity gradually came to depend not on inherited or god-given absolute attributes, but on characteristics which could be acquired by human efforts' (Whigham,1984). This nationalism and fears of difference shape the dominant attitudes of the period. When Brabantio expresses his astonishment at the notion of his daughter marrying Othello, he warns:

For if such actions may have passage free,
Bond-slaves, and pagans, shall our statesmen be (I, iii, 20)

Michael Neill in 'Bed, Race, Adultery, and the Hideous in Othello' sees the racial transgression committed by Othello as best symbolized by the image of the 'bed'. Iago's operation has been aimed at converting the absent/present bed into a locus of imagined adultery by producing Othello's abduction of Desdemona as an act of racial adulteration and a monstrous deed violating the natural laws (Neill, 1989) "Even now…now…very now, an old black ram is topping your white ewe." (I, i, 9) and "You'll have your daughter covered with a Barbary horse' and 'Your daughter and the Moor are making the beast with two backs." (I.i,10).

What makes *Othello* a shocking and painful play is that it engages the audience in a conspiracy to unveil the scene of forbidden desire. The bed is a site of forbidden mixture, a place of literary as well as social and racial adulteration. Thus, murder with its violent rapture becomes the expected consequence of such a transgression.

The sensational effects of scene of Desdemona lying dead in her bed inflame the audience's feeling of dread and pity. Henry Jackson, after seeing the performance of this play in 1610, comments:

The celebrated Desdemona, slayn in our presence by her husband, although she pleaded her case very effectively throughout, yet moved us more after she was dead, when lying in her bed, she entreated the pity of the spectators by the very countenance (Hankey,1987).

Hence, the bed, being the crime scene, ignites this strange mixture of thrilled agitation, horror and pity and evidently points to the notion that the transgression of racial boundaries is an offence that should be punished by death. Critics like Thomas Rymer illustrates that Desdemona is punished for her desire, she hears Othello and desires him and her desire is punished because it threatens the white male hegemony(Newman, 1994). While, Edward Snow illustrates that the murder in this play startles the audience as it brings into consciousness things that are known to the Elizabethan audience, but 'too hideous to be shown' (Snow, 1980).

Accordingly, in this tragedy, Othello is presented as the 'mimic man' who is 'whitewashed' by the Western culture and yet excluded from its full entitlement. He 'looks for appeasement, for permission in the white man's eyes' (Fanon, 1967) However by committing a racial transgression through marrying the fair Desdemona, he boldly reverses the rules upon which the whole social and economic structures of Europe are based on. This transgression of boundaries is displayed as a violation, an offence that must be punished by death (Neill, 1989).

## References

Bhabha, Homi. "Of Mimicry and Man: The Ambivalence of Colonial Discourse". Vol. 28 (Spring, 1984), pp.125-133.

Bradley, A.C. *Shakeaperan Tragedy: Lectures on Hamlet,Othello, King Learn, Macbeth*. London:Macmillan, 1905.

Calvo, Ana Manzanas . " Conversion Narrative: Othello and Other Black Characters in Shakespeare's and Lope de Vega's Plays". Sederi VII (1996), 251-256.

Fannon, Frantz . *Black Skins, White Masks*. New York: Grove Weidenfeld, 1967.

Foucault, Michel. "Nietzsche, Genealogy, History". In *Language,Counter-Memory,Practice*, translated by Donald F.Bouchard and Sherry Simon. Ithaca: Cornell University Press, 1977.

Greenblatt, Stephen. *Renaissance Self-fashioning From More to Shakespeare* . Chicago: University of Chicago Press,1980.

Hankey, Julie ed. *Othello:Plays in Performace Series.* Bristol: Bristol Classical Press,1987.

Hakluyt, R. *The Principle Navigation,Voyages,Traffiques and Discoveries of the English Nation*, edited by Walter Raleigh. Glascow: J.MacLehose, 1904.

Jones, Eldred D. *The Elizabethan Image of Africa* . Oxford: Folger Books, 1971.

Macaulay, T.B. "Minute on Education" . In c*Sources of Indian Tradition*,Vol. II,edited by William Theodore de Bary. New York: Columbia University Press,1985.

Meredith, Paul (July,1998). *Hybridity in the Third Space:Rethinking Bi-cultural Politics in Aotearoa/New Zealand*. Unpublished essay at Te Oru Rangahau Maori Research and Developing Conference. University of Massey, New Zealand.

Neill, Michael. "Bed, Race, Adultery, and the Hideous in Othello". *Shakespeare Quarterly*, Vol. 40, No. 4 (winter,1989), 383-412.

Newman, Karen "And Wash the Ethiop White: Femininity and the Monstrous in *Othello*". In *Critical Essays in Shakespeare's Othello*, edited by Anthony Gerard Barthelemy. New York: G.K. Hall, 1994, 124-143.

Papastergiadis, Nikos "Tracing Hybridity in Theory" in *Debating Cultural Hybridity: Multi-Cultural Identities and the Politics of Anti-Racism,* edited by P. Werbner and T.Moddod. London: Zed Books,1997.

Shakspeare , William. *Othello*, edited by M.R. Ridley. London: Methuen and Co Ltd, 1971.

Singh, Jyotsna. "Othello's Identity, Postcolonial Theory, And Contemporary African Rewritings of *Othello*". In *Women, "Race" and Writing in the Early Modern Period*, edited by Margo Hendricks and Patricia Parker. Oxon: Rutledge, 1994, 288-367.

Snow, Edward " Sexual Anxiety and the Male Order of Things in Othello" in *English Literary Renaissance*,10 (1980).

Young, Robert. *White Mythologies: Writing History and the West*. London: Rutledge, 1990.

Whigham, Frank. *Ambition and Privilege*. Berkeley: University of California Press, 1984.

الملخص:

يتناول البحث مفهومين إثنين من المفاهيم المتداولة في دراسات مابعد فترة الاستعمار وهما : المحاكاة (mimicry) والهجين (hybridity ) في مسرحية شكسبير المأساوية 'عطيل' ويعالج البحث هذين المفهومين كما تم طرحهما من قبل الناقد المشهور لفترة مابعد الاستعمار وهو  هومي بهابها .

يحاول البحث اظهار كيف يستخدم عطيل وبطريقة متناقضة خطاب فترة النهضة حول دونية العرق الاسود وتفوق العرق الابيض في تاكيده لشخصيته كرجل اسود. ولهذا فهو يظهر كشكل من اشكال (الرجل المحاكي mimic man)  الذي يبين انتمائه من خلال استخدام الوصف الغريب لهذا العرق من قبل الخطاب الاوربي الاستعماري. بالاضافة الى ذلك فأن هذا البحث يبين الاسباب الثقافية والتاريخية التي تكمن خلف  بيان زواج عطيل من دزدمونة على أنه نوع من الامتزاج بين العرقين (miscegenation) الامتزاج المرفوض والذي تكون نتيجته عقوبة الموت .

بالنسبة لاوربا القرن السادس عشر فان هذا البطل الاسود قد قام بقلب القاعدة التي تقوم عليها الهياكل الاقتصادية والاجتماعية وهي قاعدة تفوق الجنس الابيض وخضوع الجنس الاسود لها . ان هذا القلب قاد الى اتحاد هجين بين العرقين هذا الاتحاد مرفوض بتاتا من قبل اوربا القرن السادس عشر.

# IMPROVEMENT THE  PERFORMANCE OF THE SIMPLE LINEAR REGRESSION  MODEL BY USING THE WAVELET SHRINKAGE

Qais Mustafa Abdulqader

Dept.Banks Management, Zakho Technical Institute, Dohuk Polytechnic University, Zakho, Iraq

**ABSTRACT**

   In this research, Two methods have been used to build a simple linear regression model through the application on real data and taking a simple random sample size of (128) observations. The first method depending on raw data, while the second method by using wavelet shrinkage .In the second method the Daubechies wavelet (D4) was used to filter the raw data described in soft thresholding function with five multi-resolution levels of analysis and applying different methods to determine the levels of thresholdingparameters. Results of the analysis showed the efficiency of wavelet shrinkage method in improving the performance of the linear regression model through reducing the value of the  standard error of the estimate on the one hand and increasing the value of the coefficient of determination on the other hand compared with results of the estimated model of the raw data.

## INTRODUCTION

**T**he process of reducing the noise from the raw data before making regression analysis is very important in order to get improvement when modeling and forecasting .The wavelet shrinkage consists of wavelet with threshold represents a strong mathematical approach to eliminate or reduce the noise from the raw data while keeping the maximum amount of energy data that represents the realdata.

   Wavelet technique have been used in many fields.It has been observed that the raw data can be filtered and improved through using wavelet transforms.Angus A.   , CasadoM. R.  and Fitzsimons D., in 2012[1],compared the results of wavelet analysis technique with simple linear regression model when trying to understand the behavior of prices for recycled some materials with a specific focus on theUKmarket. The results showed the efficiency of wavelet analysis technique to determine what information is lost when using the raw data set. Li Y., in 2013[10],showed that the wavelet based on-line turning point detection has the advantage of being able to detect and correct the outlier on-line with turning point monitoring on a linear parametric model as the data process continuous. Mustafa Q.  and  Al-zubaydi  T.H.,  in 2013[12],compared the estimated linear models of

Box-Jenkins before and after wavelet shrinkage filtering.The results showed that more information could be obtained from a series when using wavelet shrinkage and also showed the ability of lowering the order of the estimated model of filtered data depending on some performance criteria.

   The basic idea of this paper is to show first the procedure of combination between wavelet shrinkage and linear regression analysis and second to show the advantages in improving the performance of the linear regression model through de-noising the raw data set using wavelet shrinkage and getting the new model with reducing the standard error of the estimate and improving the coefficient of determination.

   Two different methods were considered here, as showed in Figure1.In the first method ,the raw data is modeled using ordinary least square regression analysis ,then the value of both standard error of the estimate and the coefficient of determination were computed .In second method the technique of wavelet shrinkage was used through filtering the noisy data for both variables(i.e. dependent and independent variables).The de-noised data are modeled ,as in the first method, then the values mentioned above were computed again .The values were evaluated and compared to those of the first method.
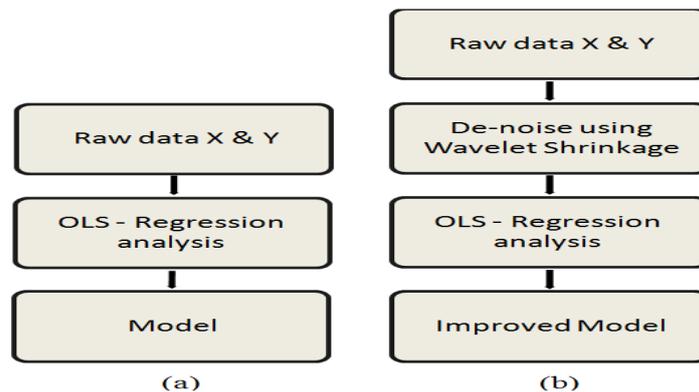
**Figure (1):** Modeling methods which represents:(a) First method and (b)Second method

## A SHORTBACKGROUNDON WAVELETS

In this section we give a brief overview of wavelet and wavelet transforms and we show a little of what they can do.

## WAVELET

A waveletis a waveform of limited duration that has an average value of zero. Unlike sinusoids that theoretically extend from minus to plus infinity,wavelets have a beginning and an end. Figure2. shows a representation of a continuous sinusoid and a so-called "continuous" wavelet .Sinusoids are smooth and predictable and are good at describing constant frequency(stationary) signals. Wavelets are irregular, of limited duration,and often non-symmetrical. They are better at describing anomalies, pulses,and other events that start and stop within the signal[7].



a- Cosine Wave        b- Wavelet

Figure(2):Continuous sinusoid and continuous wavelet

## WAVELET TRANSFORMS

The wavelet transform is a tool that cuts up data or functions or operators into different frequency components, and then studies each component with a resolution matched to its scale[6]. First we consider the Fourier transform ,which decomposes signals in to sum of periodic bases of infinite lengths ($e^{jw(t)} = \cos(wt) + j\sin(wt)$) and can transform the signal from time domain to the frequency domain and vice versa. The convention for the Fourier transform is:

$$X(f) = \int_{-\infty}^{+\infty} x(t)e^{-jw(t)}dt \qquad (1)$$

Where X(f) is the Fourier transform of the signal x(t) .The problem here is that the Fourier transform becomes non active for signal changing over time , because it provides for us the information of frequency content, (i.e., the X(f) Is not a function of time) .For this reason the Fourier Transform extended to Gabor`s adaptation called the Short-Time Fourier transform(STFT).It is defined as:

$$STFT_X^{(W)}(t`,f) = \int_{t}^{\infty} [x(t).w^*(t - t`)].e^{-2\pi ft}dt(2)$$

Where t` is the shift factor , w(t) is the window function , and * is the complex conjugate. The STFT gives us a compromise of sorts between time and frequency information .The accuracy is limited by the size and shape of the window. For example ,using many time intervals would give good time resolution but the very short time of each window would not give us good frequency resolution, especially forlower frequency signals[7].The frequency

component of a signal at a particular time instant cannot exactly be determined. This comes directly from the Heisenberg`s uncertainty principle , which states that one cannot achieve simultaneous time and frequency Resolution[8](we refer the reader[9]for more details).

This shortcoming was overcome by the development of the wavelet transformation. Wavelet transforms allow us variable-size windows. We can use long time intervals for more precise low frequency information and shorter intervals (giving us more precise time information)for the higher frequencies[7].Figure(3)shows thepartitioning of the time-frequency plane by different techniques.We may have noticed that wavelet analysis does not use a time-frequency region, but rather a time-scaleregion[11].
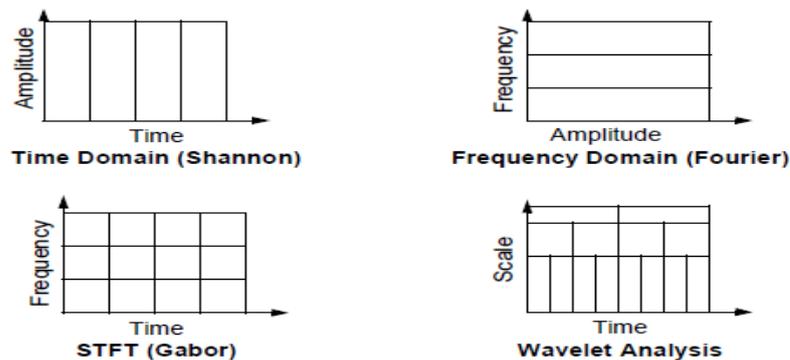


**Figure(3):**Partitioning of the time-frequency plane by different techniques

The wavelet transform is defined as follows:

$$\Psi_*^\psi(x, s) = \int x(t).\psi_{\tau,s}^*(t)d(t) \qquad (3)$$

where:

$$\psi_{\tau,s}^* = \frac{1}{\sqrt{s}}\psi\left(\frac{t-\tau}{s}\right) \qquad (4)$$

Where s is the scale variable and $\tau$ is the translation variable. When substituting this description in equation(3)gives the definition of the continuous wavelet transform CWT:

$$CWT_x^\psi(\tau, s) = \frac{1}{\sqrt{s}}\int x(t).\psi\left(\frac{t-\tau}{s}\right)d(t) \qquad (5)$$

As seen in the above equation ,the transformed signal is a function of two variables, $\tau$ and s, the translation and scale parameters respectively. The translation $\tau$ isproportional to time information and the scale s, is proportional to the inverse of thefrequency information.To find the constituent wavelets of the signal , the coefficientsshould be multiplied by the relevant version of the mother wavelet[12].

Discrete wavelet transform DWT analyzes the signal at different frequency bandswith different resolutions by decomposing the signal into a coarse approximationand detail information. DWT employs two sets of functions , called scaling functions and wavelet functions , which are associated withlow pass h[n] and high passg[n] filters .The original signal is passed through the both half band filters. After filtering half of the sample can be eliminated according to the Nyquist`s rule (i.e.;half of the samples are redundant). The signal can therefore be sub-sampled by 2,simply by discarding every other sample. This process can be repeatedfor furtherdecomposition. Figure(4)represents the wavelet decomposition tree of DWT coefficients for threelevels decomposition , where s is the original sequence , cA and cD are approximation and details(i.e.; low pass and high pass analysis filters)[11].
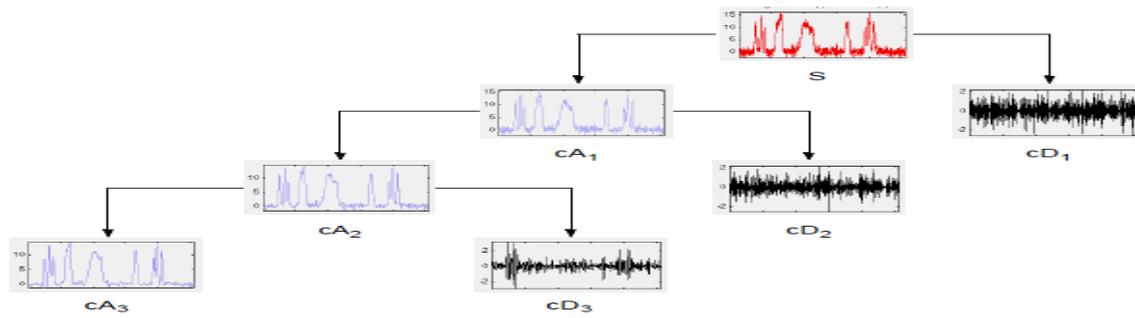
**Figure (4):** Wavelet decomposition tree of the DWT coefficients for three levels

Note that the original signal can be synthesized by the low and high frequencies sequences by assembly sequence for each assembly parts resulting from the previous parts (approximation parts and detailed) started from the last stage of analysis.

## METHODOLGY OF WAVELET SHRINKAGE OF RAW DATA

The wavelet shrinkage or wavelet thresholding is a signal de-noising technique based on the idea of thresholding the wavelet coefficients[14].The underlying model for the noisy signal is basically of the following form[11]:

$$s(n) = f(n) + \sigma e(n) \quad n = 0,1,2,\dots,N-1 \quad (6)$$

where time n is equally spaced. In the simplest model we suppose that e(n) is a Gaussian white noise N(0,1) and the noise level s is supposed to be equal to 1. The de-noising objective is to suppress the noise part of the signal s and to recover f. From a statistical viewpoint, the model is a regression model over time and the method can be viewed as a nonparametric estimation of the function fusing orthogonal basis.

The procedure of wavelet shrinkage to recover the real data from noise can be summarized as three main steps[4,5],in the first step the discrete wavelet transform(DWT) is computed from the data,in the second step the significantly large coefficients in the (DWT) are kept , others are shrinked , in the third step we apply the inverse (DWT) to the shrunken set of coefficients so as to reconstruct the set of data which are now practically free from noise.The three steps can be summarize in Figure(5).For each level ,we will have a threshold[2],the Fixed Form Threshold and MinimaxThreshold technique are considered here. The Fixed Form threshold (i.e.; Universal threshold) technique is given by the following formula[13,2]:

$$\delta^{(FT)} = \hat{\sigma}_{(MAD)}\sqrt{2\log(N)} \quad (7)$$

Where (N) is the number of wavelet coefficients in specified level ,$\hat{\sigma}_{(MAD)}$ is theestimate of the noise standard deviation and can be obtained by applying a medianabsolute deviation (MAD) estimator to the N/2 wavelet coefficients at the firstlevel of decomposition , incorporating a scale factor equal to (0.6745) .The Minimax Threshold technique proposed by Donoho(1995) so as to improve the Fixed form threshold and the idea is to seek an estimator $\hat{f}$ that attains the minimax risk, which means[8]:

$$\hat{R}(F) = \inf_{\hat{f}} \sup_{f \in \hat{R}(F)} R(\hat{f}, f) \quad (8)$$

Where:

$$R(\hat{f}, f) = \frac{1}{N}\sum_{i=1}^{N} E[\hat{f} - f]^2 \quad (9)$$

Where f=f(xi) and $\hat{f} = \hat{f}(xi)$, denote the vectors of true and estimated sample values. theminimax estimator is the option that realizes the minimum of the maximum mean square error obtained for the worst function in a given set[11].

**Figure(5):** Wavelet shrinkage chart

After estimating the threshold of a specific level , wavelet coefficients of that level are either hard or soft threshold. Hard thresholdingcan be described as the usual process of setting to zero the elements whose absolute values are lower than the threshold. Soft thresholding is an extension of hard thresholding, first setting to zero the elements whose absolute values are lower than the threshold, then shrinking the nonzero coefficients towards zero(see Figure (6)). As can be seen in the Figure 6., the hard procedure creates discontinuities,while the soft procedure does not[11]. It was shownin[3] that soft thresholding has smaller variance than hard thresholding , therefore in this paper we only consider soft thresholding for improving the regression model of the data set.
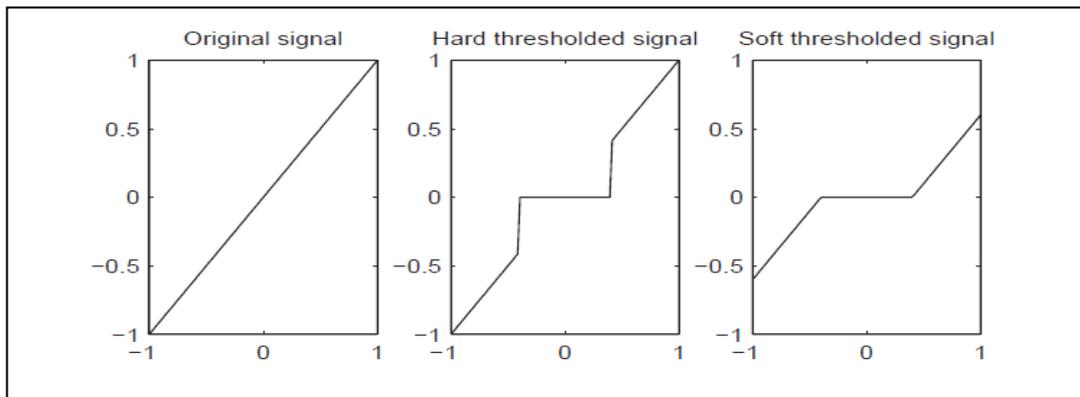


**Figure (6):** Hard and soft thresholding of the signal s

## APPLICATION

In order to assess the two different methods mentioned in Figure(1) ,we consider a real data set . The dependent variable (Y) represents the final degree of the student while the independent variable (X) represents the whole year activity. The data set with sample size (128) observations were taken from ZakhoTechnical Institute in the year study 2011-2012. Now we will use the two different methods as follows:

Method(1):The raw data set was modeled as a simple linear regression (after checking the assumptions of OLS regression analysis) , and the linear regression equation including the constant was:

$$\widehat{Y} = 5.6450 + 0.8457 * X \qquad (10)$$

And without including constant was :

$$\widehat{Y} = 1.029 * X \qquad (11)$$

Method(2): The wavelet shrinkage technique was used to eliminate or reduce the noise from the data set using Daubechies of order four (i.e.; D4) compactly supported wavelet with five multi-resolution levels of analysis. It should be noted that after many experimental trials with many wavelets families , it was found that (D4) is better than others in terms of de-noising the data set. For the selected wavelet the data was first analyzed for five multi-resolution levels and de-noised using two kinds of thresholding , Fixed Form threshold and Minimax threshold with soft thresholding function. After de-noising , the new data sets were modeled using OLS linear regression analysis . The regression equation for Fixed Form thresholding including the constant was:

$$\widehat{Y} = 3.923 + 0.903 * X \qquad (12)$$

And without including the constant was:

$$\hat{Y} = 1.032 * X \quad (13)$$

$$\hat{Y} = 1.031 * X \quad (15)$$

Also the regression analysis for Minimaxthresholding including the constant was:

The values of the coefficient of determination and standard error of the estimate for the two methods were computed and summarized in table(1).Figure(7)shows the scatter diagram of the raw data set and de-noised data using the Fixed Form Threshold and Minimax Threshold.

$$\hat{Y} = 4.321 + 0.8897 * X \quad (14)$$

And without including the constant was:

**Table (1):** The values of standard error of the estimate and the coefficient of determination for the two methods

| Method | Including the constant | Without including the constant |
|---|---|---|
| (1)The regression analysis for the raw data: | | |
| $R^2$ | 0.5390 | 0.9840 |
| SSE | 3.8672 | 3.9587 |
| (2) (A)The Fixed Form Threshold: | | |
| $R^2$ | 0.5493 | **0.9940** |
| SSE | **2.4827** | **2.5043** |
| (2) (B)The Minimaxthreshold: | | |
| $R^2$ | **0.5587** | 0.9910 |
| SSE | 2.9913 | 3.0277 |

(a) Raw data

(b) De-noised data using Fixed Form Threshold

(c) De-noised data using Minimax Threshold
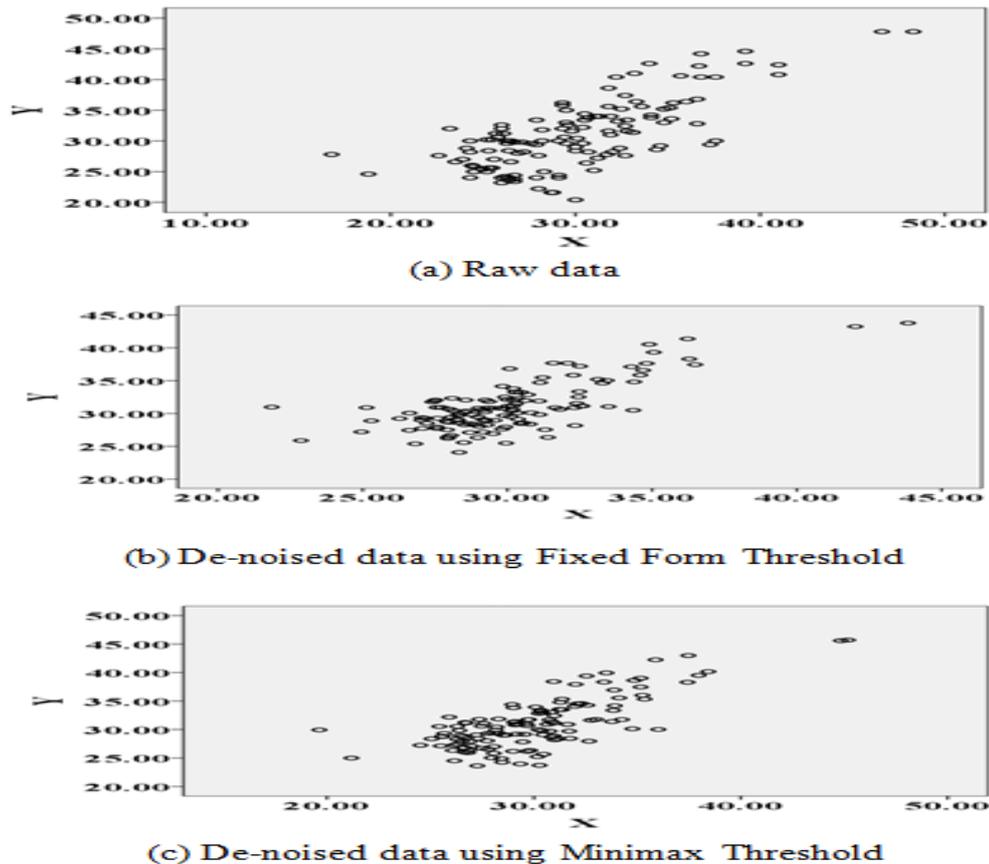
Figure(7): Raw data and De-noised data using Fixed Form and MinimaxThresholding

Now through looking at the regression equations and their values in table(1),it is clear that wavelet shrinkage reduces the standard error of the estimate. When including the constant in to the model, the reduction is in highest level when the data was Fixed Form threshold , also the wavelet shrinkage increases the value of the coefficient of determination. The increase is in highest level when the data was Minimaxthresholding.On the other hand, when removing the constant from the model the wavelet shrinkage still reduces the standard error of the estimate and increases the value of the coefficient of determination.The reduction and increase is in highest level when the data was Fixed Form Threshold.

**CONCLUSIONS**

In this paper , we combined two methods , the OLS- linear regression and wavelet shrinkage  to data set , and we were able to improve the modeling performance of the linear regression model. Indeed , we succeeded in :
• Reducing the value of  standard error of the estimate (SEE)

• Increasing the value of coefficient of determination ($R^2$)which represents the interpretation.

**REFERENCES**

[1] Angus A. ,Casado M. R. and Fitzsimons D.(2012). Exploring the usefulness of a simple linear regression model for understanding price movements of selected recycled materials in the U.K. ,*Conservation and recycling,* 60,1-15 .

[2] Atto A. M. ,Pastor D. & Mercier G.(2011). Wavelet Shrinkage:Unification of Basic Thresholding Functions and Thresholds,*Signal, image and video processing,*5,11-28

[3] Bruce A.G.  andGao H.Y.(1996). Understanding waveshrik :Variance and Bias estimation , *Journal of Biometrical* , printed in great Britain,83,4,727-745.

[4] Burrus C.S. ,Gopinath R.A. and  Gao H. (1998). Introduction to wavelets and wavelet transform , Prentice whole , Upper Saddle River , USA, N.J.

25

[5] Cascio I..L. (2007). Wavelet analysis and de-noising :New tools for economists , queen Marry Press , University of London.

[6] Daubechies I. (1999). Ten Lectures on Wavelets, (6th ed.), Regional conference series in applied mathematics , SIAM USA .

[7] Fugal .D. L.(2009). Conceptual wavelets in digital signal processing, Space and Signal technical publishing ,LLC, San Diego , USA.

[8] GencayR. ,Selcuk F. &Whitcher B.(2002). An introduction to wavelets and other filtering methods in finance and economics, USA, Academic press.

[9] Hubbard B. B. (1996). The world according to wavelets: the story of a mathematical technique in the making, USA, A.K. Peters press L.T.D.

[10] Li. Y.(2013). Wavelet based outlier correction for power controlled turning point detection in surveillance system,*school of econometrics and management*, AARHUS University , Denmark,30,317-321.

[11] Misiti M. ,Misiti Y., Oppenheim G., &Poggi J., M.(1996). Wavelet toolbox user`s guide, Version 1,USA, The Math Works, Inc.

[12] Mustafa Q. and AlzubaydiT.H. (2013). Comparing the Box-Jenkins models before and after the wavelet filtering in terms of reducing the the orders with application, *Journal of Concrete and Applicable Mathematics*,USA ,Eudoxpress ,LCC,2,190-198.

[13] Raimondo M.(2002).wavelet shrinkage via peaks over threshold , *The school of mathematics and Statistics* , Universiry of Sydney Australia , 10,1-4.

[14] Zoltan G.S. ,&SandorP.(2006). Wavelet shrinkage techniques in ECG signal de-noising, *Scientific bulletin of the PetruMaior* , University of TarguMures,2, 67-73.

چاککرنا کاریٰ مودێلا نشیڤبوونیٰ یا راستەهیٚلی یا ساناهی ب کارئینان کیٚمکرنا پێلا بچیك

پوٚخته :

ل ناۋ فیٚ ڤەکولینیٰ دا دوو رێك هاتنه ب کارئینان ژ بو ئاڤاکرنا مودێلا نشیڤبوونیٰ (لیٚژبوونیٰ) ئەوا راستەهیٚلی یا ساناهی ب رێکا جیٚبەجیٚکرن لسەر داتایێن راستی و وەرگرتنا نموونەیەکا هەرەمەکی(عشوائی) یا ساناهی ب قەباره (۱۲۸) دانه.ل رێکا ئیٚکیٰ لسەر بنەمایێن داتایێن خاۋ(خام)، بەلیٰ ل رێکا دوویٰ ب کارئینانا کیٚمکرنا پێلا بچیك(التقلیص المویجی). د رێکا دوویٰ دا پێلا بچیك ژ جوریٰ (Daubechies) ئەوا ل پلا چاریٰ هاته ب کارئینان ژ بوٚ فیلتەرکرنا داتایێن خاۋ ئەویٰن هاتینه دەست نیشانکرن ب نەخشا دەرازینکا نەرم ل گەل پێنج ئاستێن شلوڤەکرنیٰ یا دیزاینا جوراو جور .، و جیٚبەجیٚکرنا رێکێن جیاواز ژ بوٚ دەست نیشانکرنا ئاستێن پەراميتەرێن (معلمات) دەرازینکیٰ.

ئەنجامێن شلوڤەکرنیٰ دیارکر ژیٚهاتیا رێکا کیٚمکرنا پێلا بچیك ژ بوٚ چاککرنا کاریٰ مودێلا نشیڤبوونیٰ(لیٚژبوونیٰ)یاراستەهیٚلی ب رێکا کیٚمکرنا بەهاییٰ خەلەتیا پیٚڤەری (الخطأ المعیاری) یا خەملاندنیٰ ژ لایەکیٰ ۋه و زیٚدەکرنا بەهاییٰ هاوکولکیٰ دەست نیشانکرنیٰ (معامل التحدید) ژ لایەکی دی ۋه ، بەراووردی ل گەل ئەنجامێن مودێلا خەملاندی یا داتایێن خاۋ.

تحسین أداء أنموذج الإنحدار الخطي البسیط باستخدام التقلیص المویجي

الخلاصة:

في هذا البحث تم استخدام طریقتین لبناء أنموذج الإنحدار الخطي البسیط من خلال التطبیق على بیانات حقیقیة وأخذ عینة عشوائیة بسیطة بحجم (۱۲۸) مشاهدة . في الطریقة الأولى بالإعتماد على البیانات الخام في حین أن الطریقة الثانیة کانت من خلال إستخدام التقلیص المویجي . في الطریقة الثانیة تم إستخدام المویجة (Daubechies)من الرتبة (٤) لترشیح البیانات الخام الموصوفة بدالة العتبة الناعمة مع خمسة مستویات من التحلیل متعدد التصامیم وتطبیق طرق مختلفة لتحدید مستویات العتبة للمعلمات . أظهرت نتائج التحلیل کفاءة طریقة التقلیص المویجي في تحسین أداء أنموذج الإنحدار الخطي وذلك من خلال تخفیض قیمة الخطأ المعیاري للتقدیر من جهة و زیادة قیمة معامل التحدید من جهة أخرى مقارنةً مع النتائج للنموذج المقدر من البیانات الخام.