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A SOCIAL-CONTEXT APPROACH TO WRITING FOR INTERNATIONAL PUBLICATION: THE CASE OF ALGERIAN SCIENTISTS

Thesis submitted to the Department of Foreign Languages in Candidacy for the Degree of Doctorat d'Etat in Applied Linguistics

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In memory of my dear friend HALIMA SEMRA

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ABSTRACT

As a result of the hegemony of English over the world scientific production, a restricted system of communication has established itself, threatening visibility, limiting opportunities, and excluding non English speaking scientists from mainstream publication. Complex reasons lie behind this marginalisation: north / south inequity in research capacities, editorial prejudice … but mainly linguistic bias against non English speakers' submissions. Despite this situation, the language barrier in scientific communication is not deemed great importance. The issue of how non-English speaking scientists produce their articles and the difficulties they meet to acquire membership in the international research community have not been fully addressed. To understand clearly how language hinders scientific communication, there is a need to examine the social context where science writing takes place. Using interviews, questionnaires and case studies, the study explores how scientists write, how they negotiate their membership in the publishing world, and how the international audience responds to their submissions. The research concludes: a) that the language variable in the evaluation of manuscripts is as important as the scientific craft. b) That the language of science is determined by scientific conventions which are grounded in the scientific community body of beliefs and practices. c) That the range of strategies that Algerian scientists have developed might be effective at an individual level. These techniques help the researchers fulfil their immediate needs; they enable them to bypass both the linguistic and editorial constraints. But in the long run, these solutions remain ineffective. The manner in which research articles are written lacks expertise and professionalism. And neither amateurish translation nor unprofessional language teachers' assistance can provide an adequate remedy. The ultimate solution lies in the acquisition of an English proficiency both at the linguistic and the discoursal levels. To achieve this, new collaborative and teaching methodologies are suggested. The research has implications for those who do research on writing, those who teach writing and those who write for publication purposes.

Key words: NNS writing- NNS international publishing- foreign language barriers

Résumé

L'hégémonie de l'anglais comme langue véhiculaire de la science s'impose de jour en jour. Les avantages pour la communauté scientifique anglo-saxonne sont considérables. Cependant, les chercheurs non anglophones se voient souvent lésés par un usage forcé de cette langue ; mais s'y refuser revient à s'en exclure de la scéne mondiale. Très souvent, il arrive que des publications soumises à des revues internationales soient rejetées- pour diverses raisons- mais surtout parce que la qualité de l'anglais a été jugée insuffisante. Bien que la relation entre la publication et la variable linguistique soit avérée, celle ci n'a pas suscité un grand intérêt pour la recherche. Les difficultés que les chercheurs rencontrent à rédiger et à publier leurs contributions dans des revues anglophones n'ont jusque là pas fait l'objet d'enquêtes universitaires. Afin de mieux cerner le problème posé par les barrières linguistiques, cette recherche se propose d'étudier l'utilisation de l'anglais dans le processus de publication chez les chercheurs algériens. Plus particulièrement, cette étude se pose les questions suivantes : Quelles sont les stratégies utilisées par les chercheurs Algériens pour rédiger et publier en Anglais leurs contributions scientifiques ? Dans quelle mesure le critère linguistique est-il déterminant dans l'évaluation scientifique ? Quelles sont les conventions linguistiques qui caractérisent l'article scientifique ? Pour y répondre nous avons interrogé des chercheurs et des directeurs de publication. Aussi nous nous sommes intéressés à l'étude des épreuves corrigées des manuscrits. Nos conclusions révèlent que le critère linguistique est aussi important que le critère scientifique ; que les stratégies utilisées par les chercheurs répondent à un besoin immédiat, mais ne peuvent en aucun cas être considérées comme une solution définitive. La solution idoine, requiert un apprentissage adéquat de la langue ainsi qu'une connaissance épistémologique des principes qui régissent la rédaction de l'article scientifique. Pour concrétiser cela nous proposons une révision des méthodologies de l'enseignement, qui ne répondent nullement aux exigences actuelles ; et une redéfinition du rôle de l'enseignant des langues de spécialité.

ملخص

يعتبر العنصر اللغوي في ميدان الاتصالات العلمية محورا أساسيا. فبعد سيطرة اللغة الانجليزية على النشر العلمي العالمي، أصبحت نسبة مشاركة الباحثين غير الناطقين بالانجليزية ضئيلة جدا. و يرجع السبب أحيانا إلى عدم التحكم اللغوي و ضبط القواعد المنهجية العلمية التي تتميز بها كتابة المقال العلمي. ومن هذا المنطلق يناقش هذا البحث موضوع نشر المقال العلمي عند الباحثين الجزائريين و يحاول الإجابة عن التساؤلات التالية: ماهي المميزات اللغوية للمقال ؟ كيف تتم كتابته ؟ كيف يتم نشره؟ و ماهي معايير تقييمه؟يجيب عن هذه الأسئلة كل من الباحثين و مديري النشر. ومن جهة أخرى، حاول هذا البحث تحليل بعض المقالات العلمية و التعرف على المميزات النحوية الخاصة بالمقال العلمي.

LIST OF ABBREVIATIONS

ANDRU: Agence Nationale pour le Développement de la Recherche Universitaire

CARS: Create A Research Space

EAP: English for Academic Purposes

ESL: English as a Second Language

ESP: English for Specific Purposes

EST: English for Science and Technology

ESTIME: Evaluation of Scientific, Technology and Innovation Capabilities in Mediterranean Countries

FIPF : Fédération Internationale des professeurs de français

GDP: Gross Domestic Product

GERD: The Gross Domestic Expenditure on Research and Development

NNS: Non Native Speaker

OECD: Organization for Economic Co-operation and Development

OST : Observatoire des Sciences et des Techniques

P.N.R : Programme National de Recherche

SCI: Science Citation Index

UNESCO: United Nations Educational, Scientific, and Cultural Organization

WAC: Writing Across the Curriculum

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INTRODUCTION

1. Statement of the Problem

Publication is a significant achievement in a scientist's life. More than a personal advantage or a sign of immortality; it is 'public knowledge' recognition. The scientific process could only be said to have occurred when research findings are published, many scientists would argue. Therefore, a scientist's ultimate goal is not only to uncover some truth from Nature, but it is also to share with others what he is doing and what results he has arrived at so far. But research findings could be regarded as effective only when they attain a wider readership. The more a scientist's work can reach others, the better it is. This implies that a scientist ought to address his readers in a code that both he and his audience know well. This also suggests that the language variable in scientific communication is a critical issue for most scientists.

English, as the universal language of science, seems to convey practical benefits: not because it is easier to learn, but mostly because it is the language of the most developed and powerful nations of the world: The USA and GB. English offers English speaking scientists plenty of material to read, makes communication easier among them and allows access to numerous web sites...But the situation is far more different for non-English speaking scientists. Failure or inability to communicate in an international network dominated by English definitely leads to marginalisation and exclusion. Publication, in a non-English speaking context, is no longer aimed at prestige or pride; rather it is a matter of survival, as it is often summed up by the dictum: "Publish in English or Perish". If a non-native speaker scientist does not

wish to be cut off from the world of science; if he wants his efficacy to be preserved, he has no other choice than to publish in English.

This study is an attempt to describe the practice of getting published in a non-English speaking situation. It reports on the problems Algerian scientists encounter in writing in English and describes how they cope with the disadvantages, resulting from a "closed linguistic system of communication" (Baldauf, 1986:221).

2. Significance of the Study

Research in the area of language use and international scientific communication is limited, at least in Algeria. This study is aimed at initiating discussion about a neglected topic. The significance of this topic could be seen at three levels:

- The need for research on language use in International communication.
- The need for research on foreign language barriers in non-English speaking countries.
- The need for research on the use of English for research writing in Algeria.

2.1. The Need for Research on Language Use in International Communication

As the primary aim of scientific research is to promote scholarly exchange among scientists, there is a need for understanding how scientific communities and individual scientists are coping with language problems related to International communication. Baldauf & Jernudd, (1983 b: 246) point out that despite its importance in the area, the language- as a problem in communication- has only occasionally been the focus of research. Studies have mostly been concerned with issues as translation, information transfer, and the characteristics of national

literatures in some discipline. It is only when scientists began to realize how language may bias their work that the need was felt to focus on language use in International communication. The choice of this topic offers a fruitful area for investigation. Scientific publishing is a subject that is international in scope; it uses different languages; it covers a wide range of disciplines and requires a sustained collaboration among scientists speaking different languages.

2.2. The Need for Research on Foreign Language Barriers in Non English Speaking Countries

As scientific research is increasingly produced in English, there is a need for investigating the consequences of this linguistic hegemony on non English speaking scientists. There is a need for examining the degree to which English acts as a barrier in communication, and the extent to which NNS scientists are impeded in their work. The choice of one language in which researchers communicate might be seen as a practical solution that helps them overcome hurdles that hinder international scientific communication. Alternatively, the use of one language at the expense of other languages might be an impediment for many other scientists. Scholars may be hindered in their access to fields of knowledge and scholarly publication. There is a need to assess the consequences of this situation on NNS particularly on third world scientists who lack facilities for learning the language or having access to available translation services.

2.3. The Need for Research on the Use of English for Research Writing in Algeria

Although various reasons could account for the Algerian marginalisation from mainstream publication (such as editorial bias against NNS submissions, insufficient

research funding, less supporting environment…), it is strongly believed that language barriers may act as a serious problem for a great number of scientists. Their inadequate English language skills may hamper their efficiency as scientists and restrict their participation in academia.

For historical and practical reasons, Algerian scientists publish in a language that they master well: French. French, unfortunately, is a language that has already lost its aura as a language of international communication. Arabic hardly appears in the scene; its status is not yet fit to express the scientific thought. Algerian scientists are constrained to publish in a language that they don't know well. Their English language skills are too poor to enable them to cope with the international exigencies. Algerian scientists not only have difficulty in writing in English, but they also have difficulty in coping with the conventional style of the English research paper. Moreover, we can even think that their research findings which are usually formulated in French might not be properly translated in English. Possibility of distortion might derive from discourse structure and cross cultural thought patterns. Yet English proficiency in scientific communication has not been addressed in Algerian research. It is often treated as "background noise", as Baldauf and Jernudd (1983:97) comment. The language issue in scientific communication appears to be taken for granted by both linguists and scientists. The influence of English proficiency on the publication process of Algerian Scientists has rarely been studied. Given the international pressure on Algerian scientists to use English for writing and publishing purposes, and given their low performance in this language; there is a need to study how poor language skills mask their visibility and affect their participation in the world of science. To find ways to improve the situation, there is a need to examine their difficulties and assess the efficiency of their strategies.

3. Rationale for the Study

If the global concern is to reduce the inequalities in language use between English and non English speaking countries and to reconsider the distribution of languages in more enriching and egalitarian terms in the long run; for applied linguists and writing research scholars, the concern is to provide NNS writers with an immediate help so that they can overcome the 'language barriers' which hinder their participation in the wider research community. It is reckoned that NNS' difficulties are not only restricted to the use of a foreign language, but they are also concerned with the daunting task of writing a research paper. The aim, then, is to prepare the NNS membership in the targeted communities by helping them acquire a writing proficiency that takes into account both the language inadequacy and the constrained style of the research paper *genre*. The advocated training will provide them with the rules of the genre and equip them with the strategies that successful writers use.

It is, for example, argued that if a submitted article has not been written "in a way that has become standard in its field; it may get rejected even though the research itself may be significant" (Ventola &Mauranen, 1996: vi). This "standard way" is explained by the failure to adhere to the *discourse community conventions*; be it the "situational appropriateness", which Sionis (1995:100) defines as "the adherence to the written genre of specialist scientific articles in general but also to the particular style of a given journal….", or the rhetorical differences that cross cultural writing displays which Canagarajah (1996:436) explains below:

> Because these mostly bilingual /bicultural scholars are influenced by their indigenous communicative conventions, their writing will display peculiarities that are usually treated by Western scholars as ample evidence of their discursive / academic incompetence.

In response to this, Contrastive rhetoric scholars (O'regent, 1985; Clyne,1987, 1991; Connor & Mayberry,1996; Ventola and Mauranen,1996) started to examine the extent to which native culture and language impact on second language acquisition specifically on those aspects reflected on rhetorical conventions. A great deal of research has concentrated on the intercultural and textuality aspects of academic writing. And studies have investigated the differences in cultural traditions in writing and more specifically the writing difficulties that NNS and scholars experience when they write in English. ESP practitioners began to see a role in assisting NNS write according to the disciplinary conventions. These rules have mostly been illustrated through the rhetorical conventions of the research article *genre*. Swales and Feak's contribution (1994) is an illustration of applied genre studies. Based on research and teaching experience, their course-book was specifically designed for NNS to help them in their academic writing and encourage them to find out what the conventions of their fields actually are.

On the other hand, experts in writing research have begun to investigate how neophytes learn these conventions in a new culture: 'initiation processes' (Berkenkotter et. al., 1991); how they make transitions from the every day culture to the culture of formal science; how they acquire membership in their communities: 'socialization processes'; how they negotiate their writing tasks with their tutors and mentors, and how they make use of the resources available in the community.

Yet this body of research, though extensively researched, confined studies within the academic boundaries. These investigations were mostly concerned with the difficulties experienced by young writers when assigned a disciplinary writing task, or as they make transitions from an academic community to a disciplinary one. We still do not know much about these processes beyond the academic contexts. We

do not know much about the difficulties that adult writers confront as they write for academic professional communication. Although the scientific community is the most widely researched *discourse community*; there has been little concern about how NNS science writers acquire membership in the world research communities, and how they learn the discourse conventions and the verbal practices of their disciplinary culture. We still do not know why the community accepts entry for some members and debars access for some others. We ought to find out what "participatory mechanisms" (Canagarajah, op.cit) are necessary to become a fully accepted member. In this research, we propose to throw light on these neglected issues.

4. Purpose of the Study

The global aim of this research is to develop an understanding of the role of English in a community life of scientists. The study seeks to better understand the relationship between the language variable and getting published in international journals. More specifically, this investigation will try to find out the extent to which language acts as a barrier in scientific communication, and how scientists manage to survive in an English dominated research world, marked by a growing editorial and linguistic bias against non-English speaking and third world scholars. The research addresses those scientists who are already members of the world research community; and attempts to examine the 'participatory mechanisms' which enabled the fortunate lot to make their way or force their entry into the closed research world.

In order to do this, the study investigates the writing process of Algerian scientists for international publication. Specifically, it explores how the paper was written, how it was disseminated, how it was evaluated, and how it was revised. We

note, however, that writing in this research is regarded as a social process, resulting from the interaction of the reader, the writer, and the text in their context. Therefore, a particular attention is given to the various factors that may impinge upon the writing act and that may help or hinder the process. The study tries to find answer to the following questions:

4.1. Research Questions

1. How do Algerian scientists write and publish in Anglophone journals?
2. How important is the language variable in the evaluation of submitted manuscripts?
3. What linguistic changes do editorial revisions bring to accepted papers?

4.2. Research Hypotheses

1. Algerian scientists might have developed some specific communication strategies that have helped them both compensate for their linguistic deficiency and overcome the editorial hurdles
2. Although it is strongly emphasised that getting published is based on scientific values, there is clear indication that language constraints, act as a major impediment in the achievement of the process.
3. The Editorial revision is a screening system which filters the language that is not consistent with the norms of scientific discourse.

4.3. Research Methods

In order to answer the above posed questions, three qualitative research instruments have been used: Interviews, questionnaires, and case studies. Interviews were used to

collect data from biology scientists who have experienced publication in Anglophone journals. Questionnaires were addressed to international journal editors in the field of biology and related disciplines. And the two case studies were examined to allow for an in depth understanding of the scientists' writing samples and the editorial linguistic revisions. In chapter four, we report on our data collection instruments and data analysis procedures.

5. Research Motivation

Our interest in the study of scientific writing developed out of the need to find ways to provide language assistance for post-graduate biology students, whom we had in charge as part of our ESP teaching classes. What these students needed to function appropriately in their academic disciplinary fields was more than a usual English language course; rather, these apprentice science researchers needed a critical training that prepared them for their future professional life.

Their English needs are many: Biologists need English to read foreign scientific information in their fields, but essentially to take part in international communication through participation in conferences, discussion with foreign colleagues and mainly translation of their research work in foreign language publications. It is assumed, then, if reading is an important issue in the community life; it does not constitute a real impediment. Because of their immediate reading needs, scientists manage to have access to the information they want. They make use of all available means (translation, language informants, and dictionary) to overcome the language problems. In other words, they manage to read and cite the relevant literature in their dissertations and theses. Though, there is still some reason to doubt whether these tools are effectively used and whether the article being cited was even read. But

when it comes to writing, this is where the shoe pinches. Compared to citation in English, getting one's work published is the privilege of ‘the very few’. Writing in English and getting published in international journals requires sound language assistance.

While not as effective as one would hope, language teachers’ assistance is the only easily accessed means for scientists to cope with English difficulties. Language teachers are very often called upon for help by scientists. Despite their lack of qualification in the field, Language teachers have on several occasions acted as abstract writers, research paper translators, and language revisers. The task, we admit, is not as easy as it may seem. Beyond the fully justified fear “How am I going to tackle it? I don't know anything about science”, language teachers endanger the risk of distorting the scientific message. They often ignore the rules that govern scientific discourse, and accepting the task makes them shoulder the responsibility of any serious misinterpretation or breakdown in scientific communication. Still, we believe that language teachers can be of some help for science researchers to get their work written in English. When the ESP classes were launched in the seventies and early eighties, very few language teachers, teaching in or preparing materials for the EST classroom, had a scientific or technical background. Likewise, what language teachers need today is not a scientific knowledge in itself, but an awareness about the nature of scientific discourse scientists are expected to use, and a consciousness about the scientific community requirements.

Awareness, in our opinion, could be attained by investigating about scientific writing, by understanding the conventions that govern scientific discourse, by analyzing documents, by conducting surveys… and the language teacher’s

contribution could be achieved by translating the research findings into effective language assistance that fosters improvement in the area.

6. Research Limitations

Though necessarily restricted in scope, the study is intended to be an exploratory investigation aimed at understanding and describing the written product and writing process of Algerian scientists for international research publication. It is based on a research perspective that takes into account: the writer, the reader, the text in their context, and will not necessarily cover the following aspects:

6.1. The Cognitive Processes of Scientists while Composing

Although Algerian scientists were asked to describe what they actually did when they write, they were not asked to voice their thoughts during the writing process. Rather, they were asked to make retrospective accounts on what they did. Unlike other studies on the writing process of scientists, this study will not seek to answer whether the process is linear or recursive, neither does it seek to stream writers as poor or good writers. The research is mainly concerned with describing and discussing the individual strategies which scientists have developed to achieve the publishing end.

6.2. Discourse Based Interviews

The study would have been greatly enhanced if discourse based interviews had been carried out. Our interpretations of the linguistic revisions would remain idiosyncratic unless they were shared with a specialist reviser. But the issue seems difficult to achieve for many reasons. Editors are too busy to devote a great deal of their time

providing explanation. However, cross checking with other revised drafts might reveal common trends and allow the generalization of our findings.

On the other hand, this study addresses biology researchers, who published in English written international journals. These scientists work and undertake research in the University of Constantine. Thus, the ability to generalize beyond these boarders is limited. Moreover, the editors who replied to our questionnaire were randomly selected. The views they expressed remain personal, and could not be regarded as the accepted views of the whole editorial community.

7. Definition of Terms

'Publishing' and 'language barriers' can be used in more general meanings than we are intending in this research. For this reason, we propose to shed light on their restrictive uses in this thesis.

7.1. Publishing

Publishing is commonly defined as the process by which an author's interesting ideas, opinions, observations… are turned into a journal contribution. These could be in the form of research notes, conference proceedings, or review articles… For the scientist, publishing suggests more than we normally believe. It is an integral part of the research cycle. It is the "process whereby a scientist's research findings are transformed into accredited factual knowledge" as Gilbert (1976: 281) defined it. Scientists publish so that their research findings are known by others, so that their discoveries open the door for further investigations. In this study, publishing means entering the world research community both to share and to add to the world's accumulation of knowledge.

Publishing, as experienced by the scientists under study, is safe guarded by journal editors, and peer review referees who are known as the 'gate keepers' of the profession. They control access through the 'blind reviewing system' which protects the integrity of the scientific process. Benson (1994:6) offers the following definition, which defines the purpose, describes the process and delineates the scope.

> Publishing…is a way for members of the academic community to share ideas and, in the case of very perceptive writers, possibly contribute something to the world's store of knowledge. To publish is to engage in a dialogue with unseen and often unknown others; more particularly, it means being willing to discuss matters of interest and importance, drawing on accumulated knowledge of those who have addressed them in the past, speaking to those who are currently interested, and finally, perhaps, leaving a richer legacy for those who will approach these topics later.

Because the publication system is a very complex technical procedure, we provide a schematic description of the process in appendix (A) which explains why the papers take so long to get into print.

7.2. Foreign Language Barriers

The notion of 'foreign language barrier' has been coined to refer to any situation where the language can be an impediment for communication. The lack of a shared code can severely hinder the process whatever the field of activity is: whether business, travel, research or even a doctor/ patient communication. Though applicable to any situation that call for human interaction, the notion mostly refers to the failure in using a foreign language, with its attendant consequences: miscommunication or breakdown in communication.

In the English speaking scientific world, the notion was first used to refer to the inability of English speaking scientists to cope with the growing foreign language

reading needs. As very little foreign language material is ever consulted, librarians are called upon to develop translation skills to help their clients use the non English literature (Anderson, 1983). However, with the increasing use of English as a world language of science, the focus has shifted towards the difficulties faced by NNS to read and write in this language. For many NNS scientists, English is a 'language barrier' because it prevents them from access to knowledge in their fields; and limits their participation in the publishing world. In this study, the notion is used to refer to the problems met by non-English speaking scientists to fulfil their tasks efficiently because of language hurdles.

8. Structure of the Thesis

The thesis has six chapters, in addition to an introductory and a concluding section. Chapter one provides an overview on language use in scientific communication and discusses the consequences of the hegemony of English on third world NNS scientists. The following section looks at Algeria as a case in point. It examines the country's state of international scientific publication. First, it reports on its international productivity share, and then discusses the different publication indicators as visibility, specialisation, and collaboration.

Chapter two provides the theoretical models from which science writing has been approached so far. It examines both the theoretical and research issues related to the textual and the psycholinguistic approaches, showing the strengths and the weaknesses of the two frameworks. The process and product paradigms have shown limitations and have given way to the social view of writing.

Chapter three discusses the theoretical backup for this study. It reviews the two lines of research which stem from the social-context perspective: the discourse

community approach and the social constructionist view. Writing, from this perspective is defined as a social act which must be studied in its natural setting: the scientific community.

Chapter four is concerned with the description of the research design and methodology devised for the present study. The three instruments: the interviews, the questionnaires and the case studies used to collect data are thoroughly discussed in their relevant sections.

Chapter five, entitled the reader/writer interface, discusses the scientists and the editors' perceptions on different publication related issues. On the one hand, we discuss how Algerian scientists write and negotiate the acceptance of their papers; on the other we consider how journal editors respond to their submissions.

Chapter six, entitled textual data analysis, discusses our findings at the micro level. The analysis is concerned with the linguistic revisions which specialist revisers have operated on submitted articles. The chapter analyzes the changes and provides a social and linguistic interpretation to the different lexical and grammatical revisions.

The concluding section discusses the implications for those who write in science, those who teach in science and suggests some fruitful areas of investigation for those who do research on science writing.

CHAPTER ONE

The International Scientific Communication World and Algeria's State of Publication

Introduction

The global aim of this chapter is to provide some quantitative data to represent the state of publication in the world, with a particular reference to Algeria. The first part of this chapter examines the use of languages in international scientific publication, showing the unequal distribution of languages, which resulted from the hegemony of English over the world scientific production. The two faces of the problem are discussed: on the one hand, we discuss the advantages which many English speaking countries are endowed with; on the other we analyze the ensuing consequences on many southern and non English speaking countries. The second part looks at Algeria as an instance in case. We illustrate how the country's present state of scientific productivity, visibility, and international collaboration might have been greatly affected by its being both a non-English speaking and a third world country.

1.1. Languages and International Scientific communication

The expression of scientific thought in one rather than in many languages has always been characteristic of scientific communication in past times. It is reported that the transmission of scientific knowledge has most of the time been articulated in one language be it Greek, Arabic or Latin. But the emergence of some western languages in the 19th and 20th centuries was thought to be a sign of modern times. The development of sciences and the spread of scientific research have inevitably brought about the rise of other languages in scientific communication. But the

coexistence of these languages did not last long. The dominance of English has offered an unexpected scenario: the more science is expanding the more limited the use of languages is. Throughout time, the use of languages in scientific communication has witnessed a changing pattern.

1.1.1. The Development of Language Use in Scientific Communication

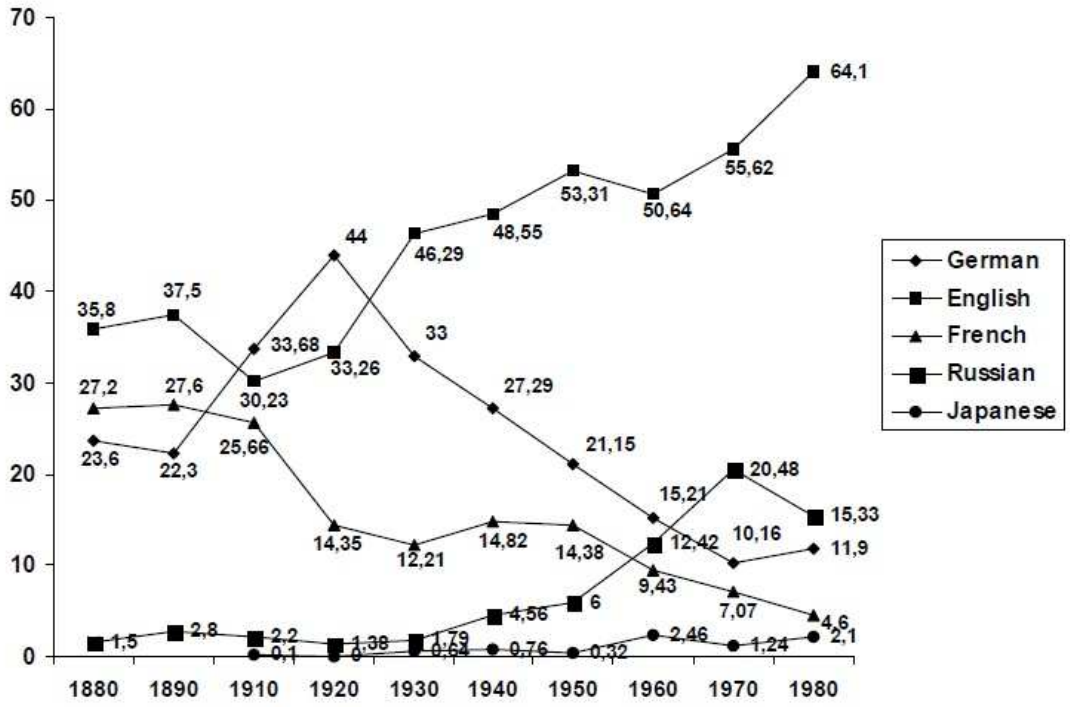
According to Hamel (2007:55), the history of language use in scientific communication is marked by a "paradigm shift" from a "plurilingual" to a "monolingual" model, which has settled down progressively throughout the 20th century. Until the beginning of the 20th century English, French, and German had a balanced linguistic position within the institutional structure of the scientific community. Through their languages, the countries were more or less specializing in some fields of science. German, for example, was an inescapable leading figure in medicine, biology and chemistry; French in law and political sciences; and English in political economy and geology (Ammon, 1998).

During the twentieth century, this stable situation began to lose balance because of the emergence of the USA at the end of World War II, as the world's new economic and political power; and because of the independence of many former British colonies. Consequently, the role and function of English has changed. For Strevens (1987:57), many of these nations, no longer regarded English as "an instrument of subservience" but as "a window on the world of science and technology». Such a development of the language has drifted a wide range of activities, such as air traffic control, business and administration, spoken and written media…, which emerging nations have found themselves carrying out in English.

The most noticeable in these areas is certainly the establishment of English as the language of scientific communication, at the expense of many other languages.

Figure1 below shows the share of American, German, French and Russian in scientific publications throughout the century (1880-1980). As can be seen, English, German and French held an almost similar ranking from 1880 until 1910, with 1910 announcing the start of the French decline. German achieved a significant rise in 1920 outranking English publications for a while. English, however, witnessed a constant increase (64.1%) in 1980, proclaiming the end of a "battle" between the "giants" (Weber, 1986:17) and announcing an era of dominance over the world scientific production.

Figure 1. Proportional Language Use in Scientific Publications in the Course of One Century in American, German, French and Russian Bibliographies



(Source: Based on data collected by Tsunoda, 1983, in Ammon, 2001:344)

By the end of the century, the hegemony of English over the world scientific research has become an indisputable fact: a truism. English is the dominant language or the *lingua franca* of the scientific community. Publication in English has become a condition for a research paper to appear in international journals and to gain visibility in the world of science.

This increasing dominance of English over the world scientific output has led to a new sociolinguistic model in present day scientific communication, which (De Swaan in Hamel; 2007:54) describes as a "galaxy of languages". The conceptual model is represented as a multileveled hierarchy with "asymmetrical relationships". The centre of gravity is English, today's exclusive dominant language, or the "hypercentral language" of the world. On the second level are found the "supercentral languages", or the languages of the former colonial and regional territories such as French, Spanish, Russian, Chinese, Japanese, Arabic, Hindi, German and Portuguese. The third level is occupied by the "central languages", that is, the national languages that have no international aura. Many of these are found in Asian and African countries. But the majority of the world's languages 98% belong to the fourth level the "peripheral languages". These represent the mother tongues of many ethnic and tribal communities which have no official status within their home countries, and obviously, these are never talked about when the debate about languages in science is held.

The model depicts a real social situation; it highlights how national languages are ranked in today's world of international communication. The distribution is unequal, and the hegemony of English over other languages is made more evident than ever.

1.1.2. English as the Lingua Franca in Scientific Communication

Studies on language use and international communication as reported by Garfield for the SCI (1967,1983,1989,1992) have shown that most of the world research in science is written and published in English, that English papers are the most frequently cited, and that English journals have the highest impact factor. *Current Contents* list thousands of titles per week and English has clearly displaced all other languages. In all fields of science, English language papers dominated, representing the lion's share of all indexed papers.

In view of these advantages, it will come as no surprise that most, if not all, of the largest publishers of scientific journals (***Taylor & Francis, Elsevier, Blackwell …***) have adopted English as their in-house publishing language; that most prestigious journals in science (***Science, Nature, The Proceedings of the National Academy of Sciences (PNAS)*** *…)* are written in English, and that most contributors to these journals are native or near native speakers of the language.

At this point, it should also be made clear that while English as an international language of scientific communication is growing by leaps and bounds; other languages show a steady decline. The increase of articles published in English was accompanied by an absolute decrease in other languages. English has beaten all other languages; even the old rival, French, is knocked out. All the scientific community has turned towards English, leaving behind other languages. The following table which illustrates the use of languages in different fields of science provides figures that clearly illustrate how extensive English has become, and how restricted other languages have ended.

Table1. Share of Languages in Several Natural Sciences in 1996

Languages	Biology	Chemistry	Physics	Medicine	Mathematics	Natural Sciences (average)
English	91.6	83.2	94.8	88.6	94.3	90.7
Russian	1.9	3.8	0.2	1.6	3.2	2.1
Japanese	1.1	309	1.7	1.8	0.2	1.7
German	1.1	1.9	0.9	2.2	0.3	1.3
French	1.4.	0.7	0.4.	1.9	2.3	1.2
Chinese	0.8	4.2	1.2	0.1	1.1	_
Spanish	0.6	0.3	0.0	1.2	0.1	_
Italian	0.3	_	0.1	0.6	0.1	_
Portuguese	0.3	_	_	0.1	_	_
Other	0.9	1.1	0.7	0.9	_	3.0

(Source: biological, Chemical, Physical Abstracts, Medline, Math Sci Disc in Hamel, 2007:58).

As announced earlier, table 1 shows that the English prevalence in natural sciences is at most and only a few other languages continue to have an insignificant share in international databases. Biology, physics, mathematics are disciplines which no longer exist outside the English medium. This utmost dominance of English in the scientific field has certainly some advantages for English speaking nations:

– A vast number of scientists have left their mother tongue languages and turned towards English for publication. As a result of this linguistic migration, the number of contributions in English by non Anglophone countries has significantly grown; while other languages have decreasingly lost their attraction as means for written scientific communication. Table 2 shows whereas English papers indexed in the MEDLINE database accounted for 53% in 1966 and 90% in 2000; the number and percentage of non-English papers have continually decreased from 47% published in 1966 to 10% in 2000.

Table 2: Number and Percentage of MEDLINE Articles by Language and Country of Publication

Year	Total MEDLINE Journal articles	English	%	Non-English	%	Anglo journals	%	Non-Anglo journals	%
1966	174,400	93,173	53	81,227	47	76,066	44	98,334	56
1970	213,066	125,496	59	87,570	41	98,663	46	114,403	54
1975	243,118	163,388	67	79,730	33	123,573	51	119,545	49
1980	258,329	185,536	72	72,793	28	137,870	53	120,459	47
1985	307,866	233,853	76	74,013	24	168,703	55	139,163	45
1990	367,568	293,265	80	74,303	20	214,027	58	153,541	42
1995	389,170	340,261	87	48,909	13	255,502	66	133,668	34
2000	468,191	419,108	90	49,083	10	317,705	68	150,486	32

Source: J Med Libr Assoc 93(3) July 2005

- A vast quantity of information is written, printed, and disseminated in English. Because their journals meet the difficulty of lower circulation, smaller readership and fewer manuscript submissions, a great number of non English journal editors have adopted English as their in-house publishing language. Such a process has awarded the native speakers with greater benefits. The English speaking scientist today can access information without having any impediment, such as struggling out with unfamiliar languages.
- A great deal of information is abstracted and stored in English. According to Truchot (2001:320), the most important databases are found in the USA. They are the most widely used. And like the SCI, these are the most influential. Some 90% of the information recorded in these banks comes from contributions written in English. And obviously, these international databases tend to favour not only publications in English but also publications originating from Anglophone countries.

– Moreover, Truchot (ibid) continue to argue that 80% of the international journals are owned by a "handful and powerful" American and British publishing houses, which use only English as the language of publication. Their journals publish just a small part of the world's scientific output, but the contributions they publish are those which are the most highly cited and thus become the most visible.

But if this state of affairs seems to suit well English-speaking countries, it is nonetheless very threatening for many non-English speaking nations. It is likely that this "linguicentrism" (Hamel, 2007: 67) impairs scientific knowledge, threatens other languages and debars NNS from scholarly publication. Researchers from both sides may be prevented from each other's science. On the one hand, scientific research published in national languages is likely to remain unread; on the other, non-English speaking authors might be denied access to the academic world of publication because of 'language barriers' and editorial prejudices.

1.1.3. Effects of the Dominance of English on NNS and Third World Scientists

As science is more and more published in English, the greatest victims are seen in many third world countries. Non-English speaking third world scientists suffer a great disadvantage. Unlike their colleagues in the old world, researchers in developing countries suffer from the lack of the basic research resources such as funding, qualified personnel, laboratory facilities, library holdings, computer aided searches of the literature etc., in addition to the added burden of a further language which might be the straw that broke the camel's back. Moatassime (1992:28), in the quote below, called attention to the serious dangers threatening the old French colonial territories:

> Les Maghrébins risquent de se trouver tôt ou tard, si ce n'est déjà commencé devant un choix cornélien dans leur quête prioritaire de la science et de la technologie, indispensables au développement…Ils pourraient se détourner du français au profit de l'anglais, à l'instar de l'Europe elle-même. D'autant que dans les colloques internationaux - sauf la FIPF, les chercheurs et les universitaires maghrébins se trouvent de plus en plus marginalisés par une utilisation à outrance de l'Anglais, même par leurs collègues français.
>
> (In their quest for science and technology, essential for the development, researchers from the Maghreb countries may find themselves sooner or later, if this has not already begun, in front of a critical choice …They would have to switch from French to English, like Europeans themselves since in international forums - except for the FIPF-, researchers and academics from these countries are increasingly marginalized by an excessive use of English, even by their French colleagues). Our own translation

But the exclusionary threat, discussed above, is already there. It has already taken place. In his numerous studies, Swales (1985a, 1985b, 1987, 1990, 1992) lamented the fact that very few papers from the third world are finding their way into the British and US journals; and pointed out that getting published in prestigious and well known journals is apparently "the preserve of developed countries". In this long indictment; Swales (1987:43) observes, analyzes, and makes the case for the NNS exclusion from scholarly publication:

> Overall, the role of the NNS in this Anglocentric research environment remains rather obscure. The limited available evidence …indicates a relatively low level of NNS contribution to the "visible" English language research literature , and what contributions there are emanate principally from NNSs located…in Anglophone environments and from the more developed nonAnglophone countries of the northern hemisphere. Hence, once again a North-South imbalance in the world- an imbalance reflected in the uncomfortable fact that numbers of able people in isolated and "off-network places are being excluded

> from actively participating in international scholarship and research.

If the main effect of the English dominance over scientific production is clearly the exclusion of third world non-English speakers from the world research, as advocated by Swales above; the reasons for absence of their visibility in the international scene are complex. First, we present ample statistical evidence to highlight the discrepancy in scientific research between the developed north and the less developed south; then we explain the various reasons that could have accounted for this "marginalization".

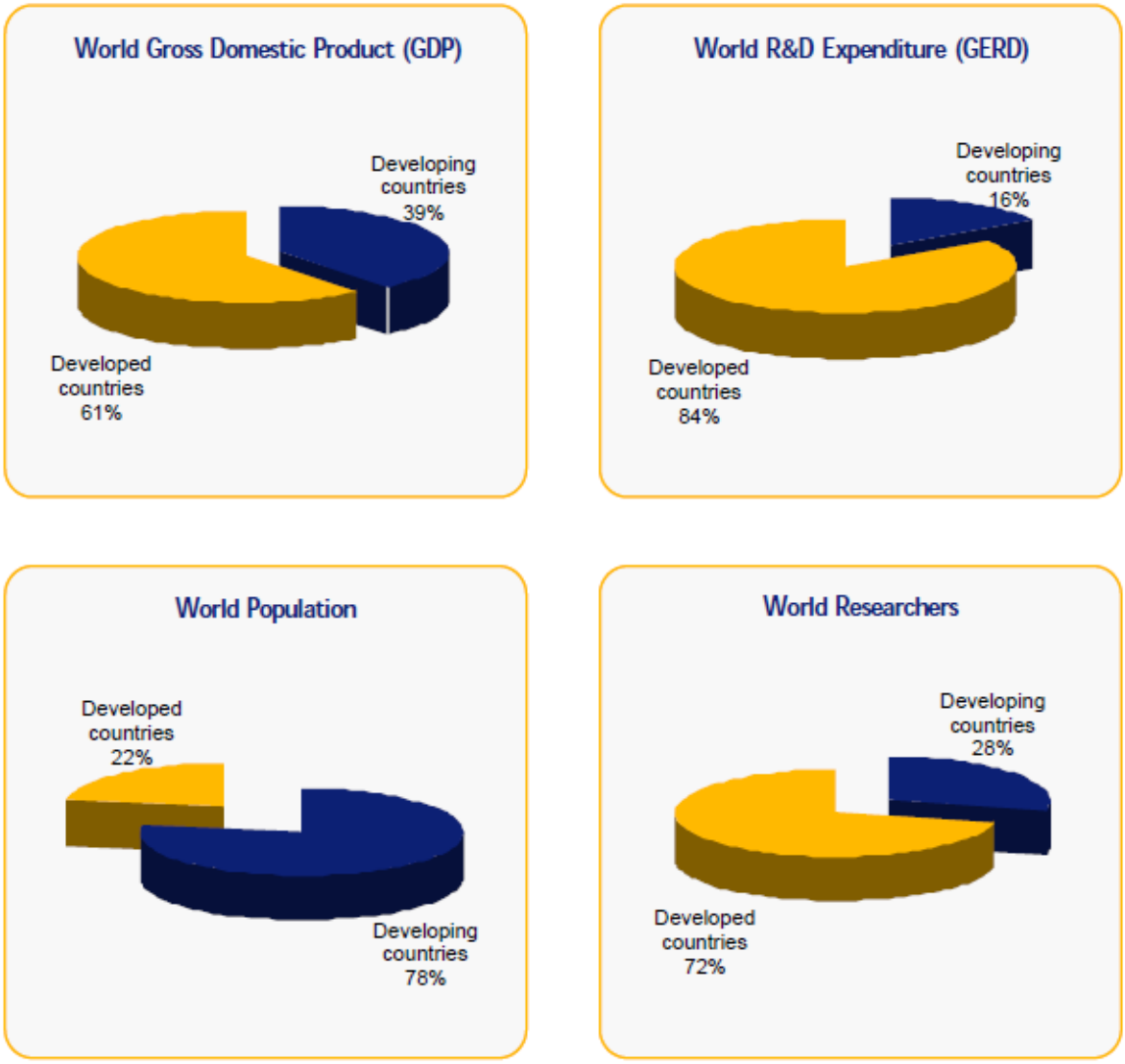
1.1.3.1. North /South Inequity in Research Capacities

The UNESCO estimates (2001: 6) indicate that in 1997, the developed countries with 22% of the world population and 61% of its GDP[1], accounted for 84% of the global investment of scientific research and development, had approximately 72% of the world researchers, produced approximately 88% of all scientific and technical publications registered by the SCI (figure 2). In other words the developing countries, with 78% of the world inhabitants and 39 % of the GDP, only contributed 16% of the global Research and development expenditures (GERD) and had just 28% of the world researchers. The figures below illustrate this unbalanced situation.

[1] **GDP**: The **G**ross **D**omestic **P**roduct is defined as a measure of all flow of goods and services produced in a country in one year.

GERD: The **G**ross **D**omestic **E**xpenditure on **R**esearch and **D**evelopment covers the total amount of money directly spent on Research &development in a given country, in a given year, independently of how this R&D has been financed (definitions adapted from the Penguin Dictionary of Economics, 1983).

Figure 2: World GDP, Population and Research & Development Resources in Developed and Developing Countries 1996/97

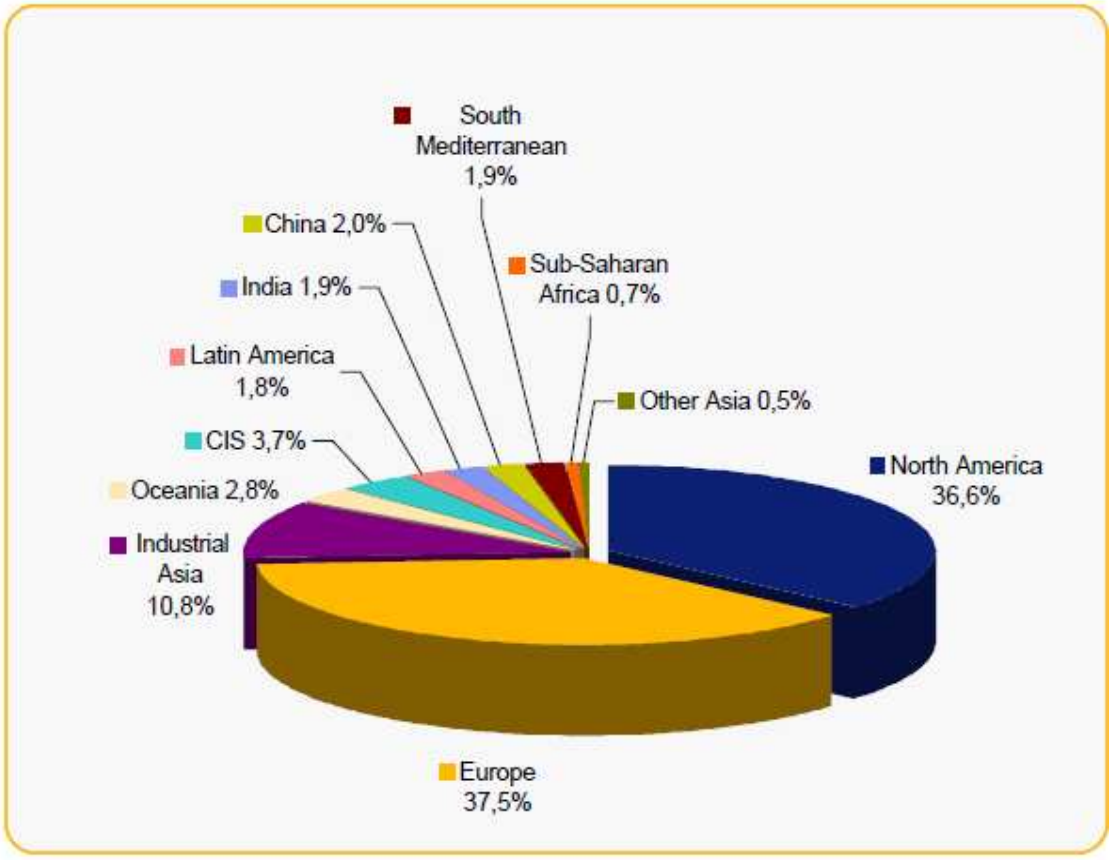


Source: UNESCO estimates August 2000

A closer look at the world scientific production of publications and its distribution by principal regions (figure3) shows that North America and Europe, clearly dominate the scientific output produced annually with respectively 36.6% and 37.5%. Together, these countries account for the three quarters of the production of

the world total of scientific and technical publications in 1997. On the opposite side, there are many developing regions/countries inching up unevenly the remaining quarter.

Figure 3: World Production of Scientific &Technological Publications 1997, By Principal Regions



Source: Observatoire des Sciences et des Techniques (OST) Paris "Science et Technologie - Indicateurs 2000'

All these figures would seem to suggest that the Anglophone supremacy over the world scientific research is both "strong and tightening" (Swales 1990:97). English has already masked the existence of other languages, now it is denying the very subsistence for third world research. It is even anticipated that greater involvement by the southern countries is unlikely to occur in the short run because the cost of access is beyond their means. It is argued that "…since inequalities of wealth persist, the international scientific hierarchy is not about to change" (Rumble, J in Braun et

al., undated internet document)[2].

1.1.3.2. Language Barriers in Scientific Communication

Language barriers in scientific communication could be regarded as one of the most important consequences resulting from an international communication network dominated by English. In many countries, particularly the less developed ones, English is neither a mother tongue language nor an official one, but has merely an outsider status. Today's English unique use in science has not only limited access to information for an important number of NNS scholars, but it has also restricted communication among them.

Unlike their native counterparts who have the greatest body of literature available in their language, NNS scientists lack this advantage. They cannot read in this language and given the size of the scientific literature in English, they can neither rely on abstracts nor on translation services which are costly and even inexistent in their countries. Because of language barriers, NNS scientists are hampered in their access to the world's scientific information and impeded in their knowledge. Such a deficiency impairs their roles both as science readers and as science writers.

Moreover, the use of English in scientific research has also imposed a linguistic scientific discourse model that takes no notice of the difficulties NNS meet in writing in a foreign language. Such a model requires sound language proficiency, but ignores the NNS cultural differences and thought patterns. If they want to get published, NNS have no other alternative than write in English and formulate their research findings according to the English conventional discourse style model. Though, this

[2] Chairman of the international Council for Science's committee on data for science and technology (CODATA) in *a global snapshot of scientific trends* Tibor Braun,Wolfgang Glanzel, Andras Schubert

does not save them from fault-finding comments and very often straightforward editorial rejection.

1.1.3.3. Linguistic Bias against Non English Research

Moreover, the increasing focus on English as the international language of science tends to deny the existence of other languages. While few decades ago English speaking scientists could hardly ignore foreign publications in their relevant fields of knowledge; today, they disregard any scientific findings outside English. According to Levin (1981:219), English speaking authors exhibit "a sort of chauvinism (towards other languages) which tends to limit the breadth of bibliographic experience and impoverish scientific knowledge of pertinent work carried out and published in foreign countries". In their study, Levin and Jordan (1981: 438) report that when NNS publish in their own languages, their findings fail to reach the international audience because English speaking scientists "read only what they can read easily in their native language, tending to bypass what they cannot even if the work might be relevant to their own". Baldauf and Jernudd (1983: 98) , recognizing this bias in their turn, explained that English speaking scholars are generally less prepared to read materials in their fields in other languages than they were a few years ago. They conclude that such a discriminatory use of languages in science may not only prevent scientists from access to other fields of knowledge, but it is likely to undermine the international scope of scientific laws.

1.1.3.4. Editorial Bias against Non-English Submissions

An additional consequence deriving from this situation is the "editorial bias" (Swales, 1985, 1987, 1990) against submissions from non English speaking authors

and southern countries. Very often, condemns Hamel (2007:168), editors decide publishing English speaking authors' work even if their contributions are repetitive and bring no advancement to the field. They, certainly, find it easier to publish papers that are formulated in good English and in a more conventional discourse style. Conversely, "real jewels of inspiring research may never reach the English language readership or appear only years later just because they are written in other languages" (ibid). Such a prejudice is undoubtedly not new, but could be traced to the 'Matthew Effect' that influenced the scientific community reward system. Based on the following principle: "For unto everyone that hath shall be given, and he shall have abundance: but from him that hath not shall be taken away even that which he hath,"(Matthew in Kneller, 1978:205); the system has tended to favour all those already established scientists, paying little or no attention to those researchers who come from unknown places, even if their work might be of some value. This situation is made worse by a linguistic prejudice which some editors and referees have developed against non-native submissions. There is also an obstacle of subjectivity on the part of reviewers, notes Crosnier in Sionis (1995:100) "… English is praised or criticised depending on whether they (science contributors) are in England or France"; implying thus that the value of an article is sometimes determined by who wrote it, independently from the claims it made. We may be faced with a CATCH 22 situation: You can publish only if you are an accepted member of the network. But you cannot be a member of the network unless you have published.

Rather than tightening bonds among members of the scientific community, this growing dominance of English over the world scientific output has widened the gap between nations, opposed the rich to the poor, strengthened the strong and weakened

the weak It has led to the emergence of a network of communication based on unequal opportunities. While English speakers are privileged; speakers of other languages, mainly third world scientists' are disadvantaged: their knowledge is restricted, their participation is weakened, and their visibility is threatened. In the next section, we propose to look at the Algerian situation and examine the extent to which the country is affected by the consequences described earlier.

1.2. Algeria in the Scientific Publication World

As stated earlier, our concern in this section is with Algeria. Our purpose is to examine the consequences of the previously described situation and their impact on the country's production and dissemination of scientific knowledge. These consequences are often made clear through the country's research output and the performance of its scientists. Although other causes could impinge on Algeria's present state of publication (for example research expenditure and funding), we believe that the creation and diffusion of scientific information are greatly influenced by the scientists' integration in and interconnections with international research networks. The relationship among scientists is obviously knitted because of research activities, but it is often strengthened and tightened through language bonds. Thus scientific productivity, visibility and collaboration are indicators, which are not only revealing of the country's involvement in the world of science, but they are also enlightening on the Algerian scientists' ability to communicate and exchange scientific information in the international research networks through the English medium.

Part two of this chapter will therefore focus on these indicators. It tries to report on the country's main characteristics in the area. It not only considers how

much Algeria contributes to the world's stock of knowledge in terms of number of articles produced, but it also examines the country's publication profiles. And because language is our focal point, we shall examine how Algeria's global scientific production is linguistically distributed.

However, though scientific production is a broad term which involves a variety of research genres such as conference proceedings, abstracts, technical reports, reviews, theses etc.; the term in this study is restricted to the research paper, the most representative channel of research communication. Unless otherwise stated, the journal publications reported on here, are retrieved from international journals, which are indexed by the major scientific data bases. Consequently, they use English as their language of publication.

The data used in this section is retrieved from three major sources: First, it relies on the bibliometric study which was produced as part of the ESTIME project (2007). The study offers a quantitative analysis of the scientific research production in seven Mediterranean countries. The indicators presented in the project are calculated from the international OST publications databases. The second resource, which this study draws upon, is the ANDRU document (2008):« La Production scientifique issue de PNR 1998-2003: analyse bibliométrique». The study assesses the research activities lying within the scope of the National Research Programmes within the Algerian universities. And our third bibliometric support is Mezghiche and Lagha's contribution: « La recherche scientifique en Algérie existe-elle ? » (2006). The study addresses international research publication trends for Algeria over a 13-year period (1982-2005). Searches were conducted using the (PASCAL/ INIST) database from which the authors retrieved 5.731 articles. The analysis looked at the publication growth, the distribution by disciplines, and by authors' institutional

affiliation, and the international collaboration. This section will cover these topics: Algeria's scientific production and specialisation, impact and visibility of Algerian science, and international collaboration.

1.2.1. Algeria's Scientific Production

Various analyses of the growth of scientific output show that Algeria's total number of scientific publications in all disciplines has been steadily growing both at the national and international levels (ANDRU, 2008; ESTIME Project, 2007; Mezghiche and Laghaa, 2006). Fundamental sciences have largely contributed to increase the country's world share of publications during the previous decade.

The production of research papers has expanded from 0, 24 ‰ in 1993 to 0, 49‰ in 2004. It has more than doubled throughout the 90's. Table 3 shows that the number of publications has respectively increased from 148 to 214 in 1993 and 1999 to 378 in 2004. These figures suggest that the growth rate of publications is relatively climbing.

Table 3: World Share of Scientific Publications for all Disciplines (1993, 1999, 2004 and Evolution); Comparison with Other Countries.

Algeria						South Africa	Chile	Thailand
World share‰	1993	1999	2004	Evolution 2004/1993 (%)	Evolution 2004/1999 (%)	2004		
Publications in Fractional counts[3]								

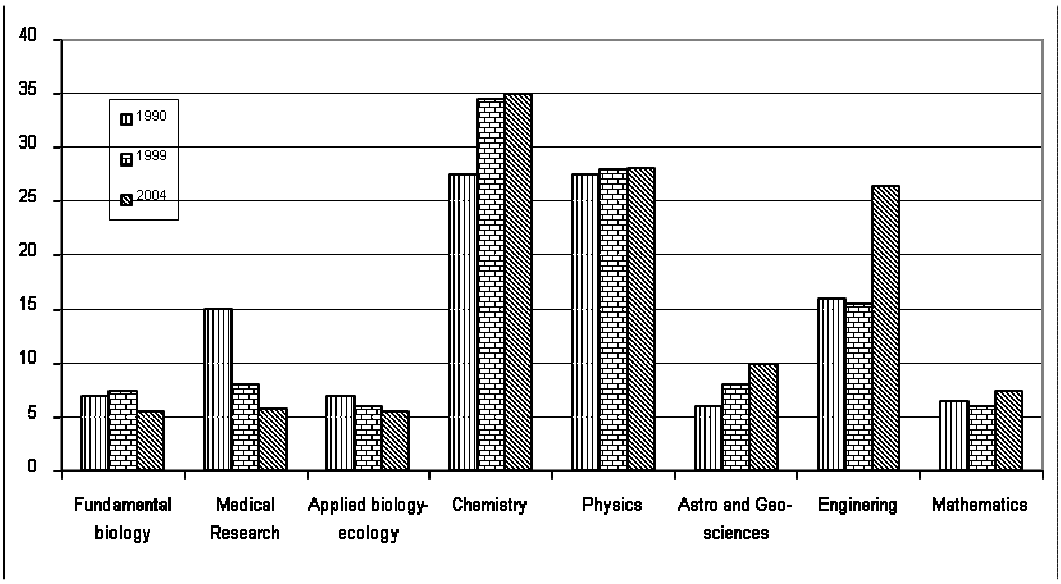
[3] Fractional counts: contribution to world science for each author in co-published contributions. is fractioned in order to have a count of one for each article(or 100%on the whole group of authors)This type of counting , where each article weights as a unit , permits to make counts of publications for a country or discipline, since all totals add up.
Integer counts: participation in world science. Each actor is credited with a unit as long as he is present in a publication.

World share‰	0,24	0,27	0,49	+102	+79	3,49	2,07	1,65
Number of publications	148	214	378	+156	+77	2683	1594	1267
Publications in integer counts								
World share‰	0,38	0,49	0,73	+ 89	+ 48	4,64	3,03	2,43
Number of publications	233	353	559	+140	+58	3570	2338	1870

Source: Thomson Scientific data, OST computing OST 2007

The most significant disciplines which have largely helped the production increase as figure 4 shows are: chemistry 35%, physics 28%, and engineering 27%. Other disciplines (mathematics, biology and geology) have not increased very much. We can even say that they have slightly dropped their production. However, it is, clearly noticeable that medical research has observed a clear decrease from 15% to 06%.

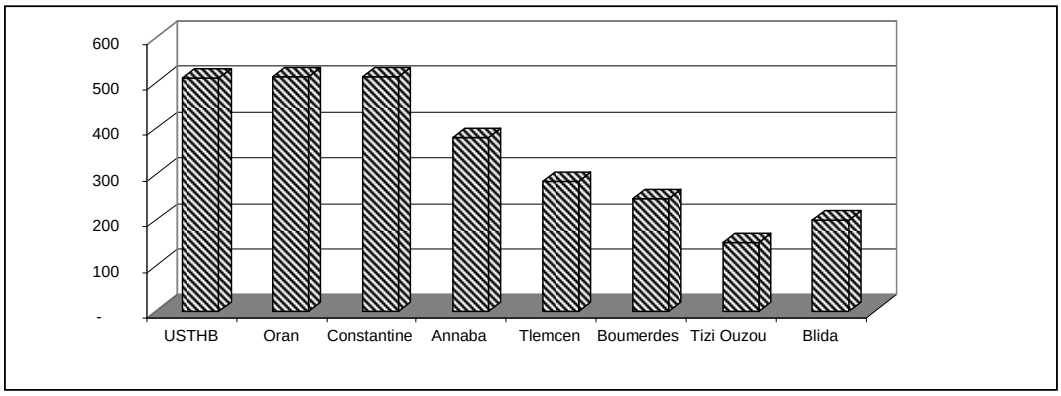
Figure 4: Weight of Disciplines in Scientific Publications for Algeria 1993, 1999, 2004)



Source: Thomson Scientific data, OST computing

In their study, Mezghiche & Laghaa (2006) note that the largest bulk of this production is concentrated in the most important universities (Oran, Algiers and Constantine) which emerge as Algeria's major research institutions, as this shown in figure 5 below.

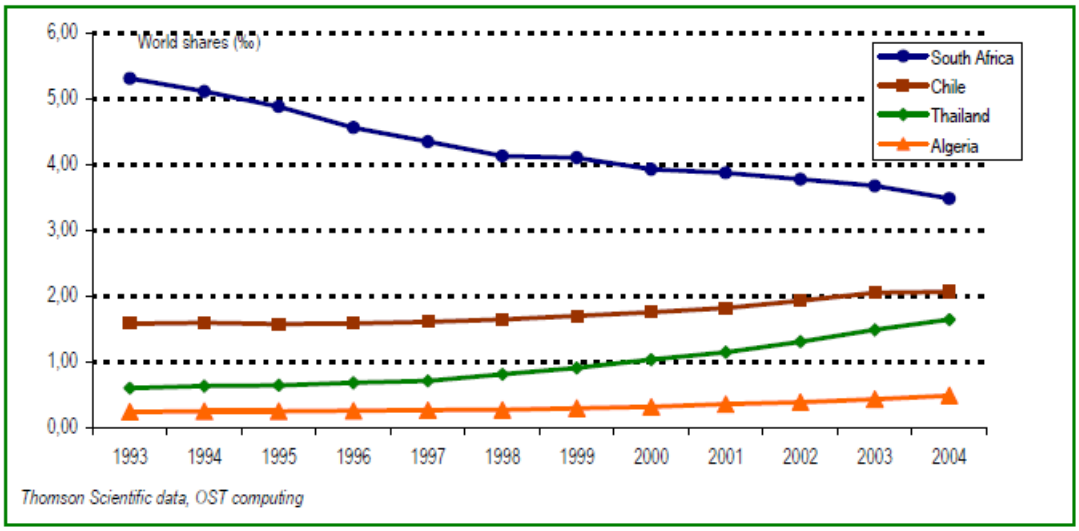
Figure 5: Distribution of Scientific Publications by Authors' Institutional Affiliation



Source: Mezghiche & Laghaa Quotidien d'Oran. 22 02.2006

Nevertheless, despite this growth, Algeria's share of international publication remains significantly low. Compared to other developing countries (Chile, Thailand and South Africa); the world share of Algeria, as indicated by figure 6 is still low and represents less than 1 % of all total publications. But a slight increase is noticeable from 2000 onwards.

Figure 6: Evolution of World Share of Algeria's Scientific Publications From 1993-2004



Algeria's scientific production is insignificant in the world research balance, but an effort is made to increase its contribution share. This is noticeable through its

participation growth rate which has been increasing. This relative growth is essentially the result of the 1998 regulations[4] which supplied scientific research with new institutions and with a new organization scheme. This has led to an outburst of national research projects and an increase in the number of researchers. Researchers, in Algeria's oldest universities and scientists in fundamental sciences disciplines, contributed a great deal to this growth. Clearly, Algiers, Oran and Constantine universities have a relative important number of local researchers who have graduated abroad, have acquired a research tradition, and are involved in well established research networks. These scientists have played an important role in stimulating research activities and recruiting new collaborators. But this human input, we believe, would have been more effective if supplied with more supportive environment and more substantial funding. This is particularly valid for disciplines which have witnessed an important decline in their productivity. To catch up with other countries, medical research and fundamental biology disciplines, more than any other fields, require important resources, new technologies and qualified know-how.

1.2.2. Algeria's Specialisation Fields

The specialization indicator is a measure which shows that a given country is specializing in a particular field. The measure varies below and above the world average. When the index is above 1 (+1), it indicates that a specialisation in the discipline is taking place; but when it is below 1 (-1), it implies that there is no specialisation in a given discipline. The purpose of this indicator is to inform on the activities of research that a country is more involved in and to determine the country's publication profile. The specialisation index is determined by calculating

[4] LOI N°98-11, *Journal officiel de la République Algérienne*, 62: 3-42, 1998

"the ratio of the world share of publications in the discipline to the world share of all disciplines" (OST, 2007:9).

With regard to scientific specialisation, Algeria exhibits a specialization in the fields of mathematics, physics and chemistry and to a lesser extent in engineering and astro and geo sciences (Table 4). The fields of specialization are highlighted in grey cells.

Table 4: Specialisation Index for Algeria in 8 Disciplines (1993, 1999, 2004 And Evolution); Comparison With Other Countries

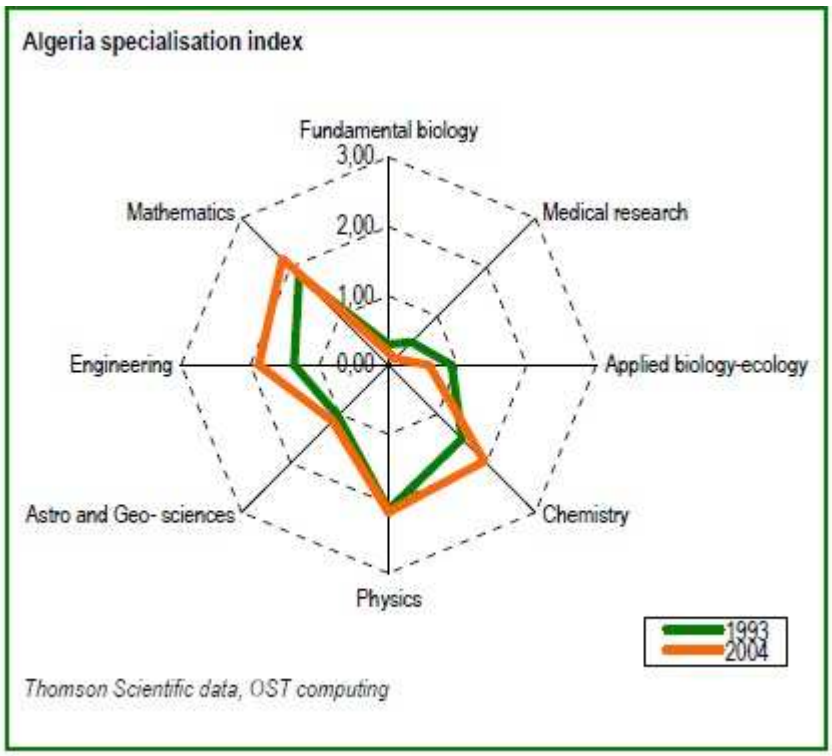
Specialisation index								
Algeria						**South Africa**	**Chile**	**Thailand**
Discipline	**1993**	**1999**	**2004**	**Evolution 2004/1993 (%)**	**Evolution 2004/1999 (%)**	**2004**		
Fundamental biology	0,30	0,26	0,18	- 40	-29	0,65	0,85	0,97
Medical research	0,47	0,22	0,13	-71	-38	0,87	0,78	1,13
Applied biology-ecology	0,91	0,81	0,59	-36	-28	3,04	1,92	1,68
Chemistry	1,51	1,83	1,96	+30	+7	0,70	0,95	1,02
Physics	2,09	2,21	2,12	+1	-4	0,42	0,73	0,33
Astro and Geo sciences	1,03	1,15	1,14	+10	-1	2,07	2,20	1,03
Engineering	1,36	1,91	1,88	+38	-2	0,82	0,82	1,17
Mathematics	1,83	1,48	2,16	18	+46	0,91	1,56	0,37
Total	1,00	1,00	1,00	-	-	1,00	1,00	1,00

Source: Thomson Scientific data, OST computing OST 2007

The figures, in the table above, show that the specialisation degrees are above 1(+1) respectively in 1993, 1999, and 2004; indicating the disciplines in which specialization is occurring. As can be seen, in 2004 the indexes are respectively of 2.16 for mathematics; 2.12 for physics; 1.96 for chemistry; 1.88 for engineering; and 1.14 for astro geo sciences. On the other hand, these are below one (- 1) for biology 0, 18; for ecology 0, 59; and for medical research 0, 13, showing no specialisation in these fields. Compared with Algeria, South Africa, Chile, and Thailand show a

different publication profile. These, however, show a tendency towards the fields of applied biology/ ecology. Thailand, comparatively, is slightly strengthening its specialization in medical research, with a degree of specialisation of 1, 13; while Figure 7 below shows that Algeria is increasing its specialisation in chemistry, engineering and mathematics.

Figure 7: Specialisation Index for Eight Disciplines



What does this publication profile tell us? Why is Algeria specializing in these fields and not in others? The Algerian publication profile is much more concerned with the traditional science and technology field. The model is characteristic of developing countries, where greater emphasis is put on chemistry, physics, mathematics and engineering. At the same time, the country is under-specializing in medical research, fundamental biology, and earth and space sciences. Specialization in these fields is obviously the preserve of developed nations, with the Unites States and Europe as the leading figures. Because access to these fields is extremely

difficult, as explained above, it is improbable for developing nations to enter the research space of these disciplines for the time being. Research in this field is not Algeria's national priority and international support to any specific areas is still awaited for.

1.2.3. Algeria's Scientific Visibility and Impact

Visibility and impact could be regarded as the recognition of a scientist's work by other scientists in the wider research community. These are often measured by the frequency of citations a researcher receives from his peers. Publication in well known journals allows wider exposure to readership. Thus, the visibility and impact measures are closely related to the quality of the journals in which the research papers are published. Research papers are said to have a greater impact when published in top ranked journals. These journals are indexed by the major databases; they are obviously written in English and are considered by editors to have the highest impact. Put simply, these journals are the most frequently read and cited. To describe the visibility of Algerian science, it is necessary to answer the following questions:

- How frequent are Algerian scientists cited by their colleagues worldwide?
- Which Algerian fields of science are the most visible?
- What impact does Algerian science have on the world science?
- Which journals do Algerian scientists publish in?

Citation Analysis and the impact index are the indicators that help us find answers to our queries.

1.2.3.1. Citation Analysis

Citation analysis determines how popular and how significant a published article is. In other words it quantifies the importance of a scientist's work within the research community. The more a country's publication is cited the more visible it is. The calculation of the world share of citations of a given country, according to the OST (2007:11), is achieved by calculating "the ratio of the number of citations received over 2 years by researchers of a country to the total number of citations received for the same 2 years by all the worldwide publications of the database." Table 5 below shows that in 2004, Algeria's world citation share in all disciplines was 0, 11‰, meaning that the country is not visible. Nevertheless, except for medical research and astro geo sciences, fundamental science disciplines, the citation share has progressed between 1993 and 2004 from 0, 06‰ to 0, 11‰.

Table 5: World Share of Citations

Algeria: World share of 2 year window citations					
Discipline	**1993**	**1999**	**2004**	**Evolution 2004/1993 (%)**	**Evolution 2004/1999 (%)**
Fundamental biology	0,02	0,03	0,04	+80	+64
Medical research	0,03	0,02	0,01	-52	-31
Applied biology-ecology	0,06	0,03	0,07	+20	+109
Chemistry	0,11	0,14	0,31	+176	+121
Physics	0,13	0,22	0,31	+129	+41
Astro and Geo sciences	0,08	0,15	0,13	+54	-16
Engineering	0,15	0,28	0,35	+131	+26
Mathematics	0,16	0,17	0,36	+119	+114
Total	0,06	0,07	0,11	+77	+50

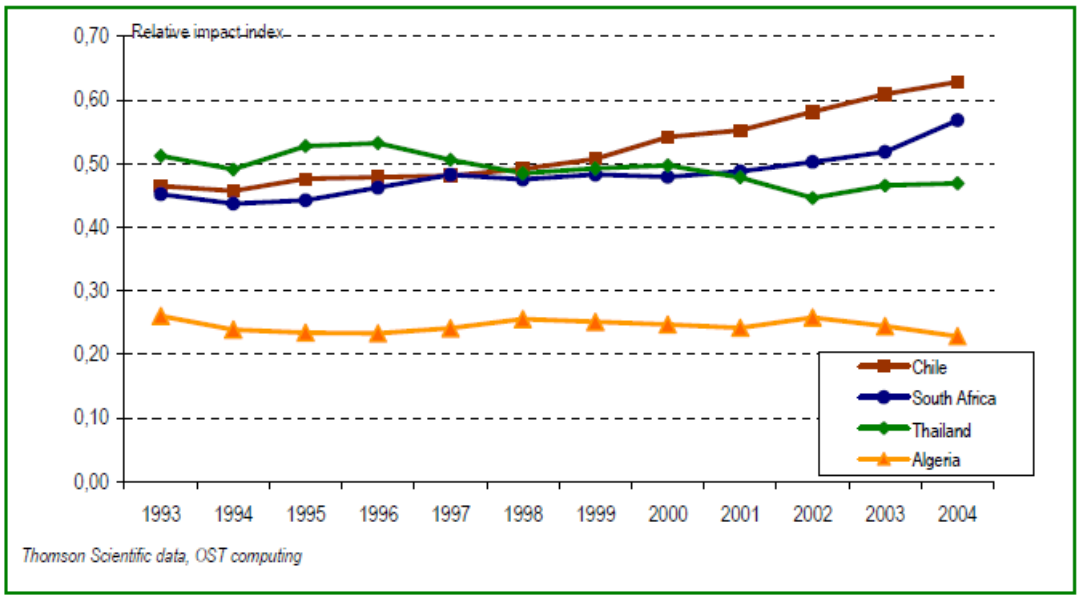
Source: Thomson Scientific data, OST computing *OST 2007*

The most visible fields of science are obviously the fundamental sciences. Mathematics 0, 36‰; engineering 0, 35‰, physics 0, 31‰ and chemistry 0, 31‰ are the four disciplines which have contributed to increase Algeria's world share of citations, and are consequently the disciplines in which Algerian works are cited. Other disciplines, as can be seen, have no significance in the area. Algerian science is not frequently cited; the figures are not revealing of any impact, as we shall illustrate in the following section.

1.2.3.2. Impact Factor

Resulting from citation, the impact factor is also used to measure the value of published work or its wider influence. Based on citation counts, it places journals in a quality ranking order. It is calculated by how often a journal's papers have been cited in a particular year. In other words, the more a journal publishes frequently cited articles, the higher impact it is. For example, ***Nature*** and ***science*** are the most highly ranked journal of the field with (with impact factors of 27.96 and 23.33,). The calculation is quite complicated, but put simply; it is the ratio of the world share of citations received (by a journal) over two years by the number of publications (OST, 2007:12). When the value is above 1, it indicates that the country received more citations than the world average; but when less than 1, it implies that the country's publications are less visible.

Figure 8: Evolution of Relative Impact Index in Scientific Publications from 1993-2004; and Comparison with Other Countries



Algeria's impact index, as indicated by figure 8 is low; the journals in which Algerian scientists publish do not have a great impact. Compared to other countries (Chile, South Africa, and Thailand), Algeria's impact is less visible. It is situated between 0.20 and 0.30, showing a slight decrease from 2002 onwards.

Table 6 shows that the value is inferior to one for all publications, meaning that the impact index for Algeria is not significant. The grey cells are highlighted to point at the fields where the number of publications is lower than 20. On the whole, the impact index evolution in the eight disciplines is not positive. It even decreased from 0, 26 in 1993 to 0, 23 in 2004. Physics and chemistry are the only disciplines which maintained their stability over the studied period.

Table 6: Relative Impact Index for Algeria in 8 Disciplines (1993, 1999, 2004 And Evolution)

Algeria: Relative impact index					
Discipline	**1993**	**1999**	**2004**	**Evolution 2004/1993 (%)**	**Evolution 2004/1999 (%)**
Fundamental biology	0,32	0,36	0,47	ns	ns
Medical research	0,24	0,28	0,20	ns	ns
Applied biology-ecology	0,27	0,17	0,25	ns	ns
Chemistry	0,31	0,25	0,33	+5	+28
Physics	0,26	0,34	0,29	+11	-12
Astro and Geo sciences	0,32	0,48	0,22	ns	ns
Engineering	0,46	0,45	0,38	ns	-16
Mathematics	0,37	0,38	0,34	ns	ns
Total	0,26	0,25	0,23	-12	-9

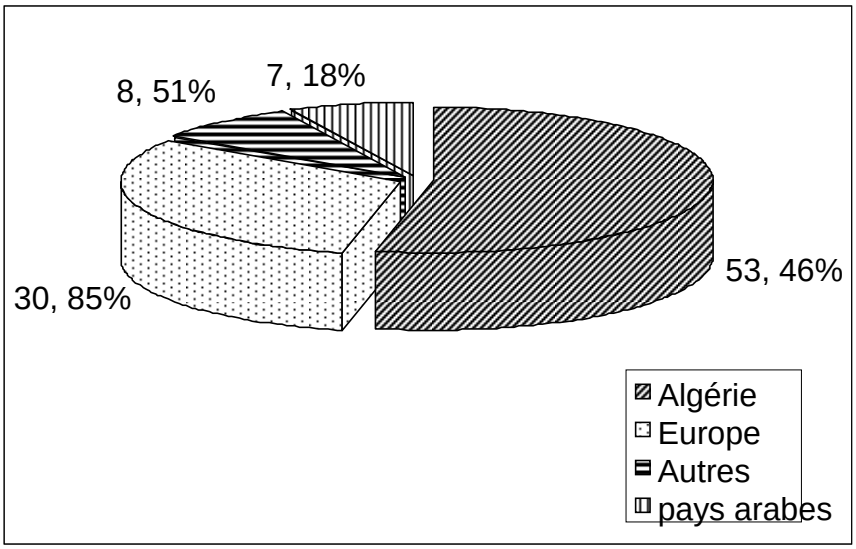
Source: Thomson Scientific data, OST computing

It is believed that this low or rather lack of impact of Algerian publications on the international scientific community might be explained by the prejudice against third world science. As we explained previously, southern scientists are not cited by their northern counterparts even if the research is significant. Moreover, third world scientists are not allowed access to top quality journals which have a high impact index. As we have repeatedly mentioned, these high ranked journals fall within the grip of developed countries and are out of reach of third world scientists. These top journals are highly selective and observe very high rejection rates. Scientists from developing countries could only publish in second category journals.

According to the ANDRU statistics, and as Figure 9 below shows, Algerian scientists publish primarily in local journals. More than half 53, 46% of their

research findings are published in Algeria; 46, 54 % are printed in international journals (233 journals), noting that 07, 18% of these are available in the Arab world in journals which use English as their medium of communication.

Figure 9: Distribution of Algerian Publications by Principal Regions



Source : ANDRU - La production scientifique issue des PNR 1998-2003 : Analyse bibliométrique, 2008.

As stated in the previous section, Algerian scientists cite extensively their foreign colleagues from various countries, but their own work is hardly cited. To gain visibility, they publish in international journals, but when faced with difficulty they publish in local journals that are often free of editorial bias and linguistic constraints. Also these do not take long publication times. The choice of one country rather than another depends on many factors, but essentially it is determined by the scientists' field of specialization, journal focus, collaboration and interaction with worldwide research networks. It may also happen that this choice is dictated by linguistic considerations.

1.2.4. Algeria's International Collaboration

International collaboration is the cooperation that ties scientists from different parts of the world, working in the same specialised fields. The findings of their individual research are often brought together and result in a co-publication. Co-publication is not only revealing of the international scope of scientific problems, but it is also illustrative of the geographical and institutional linkages that scientists tie with other research networks. A lack of internationalization in scientific research is likely to mean that local scientists are isolated and cut off from the rest of the world, and that they have no chance of communicating and sharing ideas with other researchers. This also suggests that national research findings are restricted in scope. To measure Algeria's international collaboration and understand its co-publication trends, we shall look at the share of its international co-publication, the countries with which it collaborates, and the disciplines in which Algeria develops partnership.

1.2.4.1. Share of International Co-Publications

Like citation, co-authorship is a good indicator that fruitful collaboration is taking place, and that scientists are participating in international research networks. It is even reported that the growth in the number of working groups and of scientists doing research in the same area often results in higher productivity. This is generally the case for the US and some European countries where international collaboration is a growing component of research activity. Table 7 below indicates that Algeria international collaboration between1993 and 2004 is gloomy. The indicator for this process is the decline in the number of papers co-authored by scientists from different countries. Algeria's share has dropped from 62.7 % in 1993 to 57.9% in

2004. This decrease has mainly occurred in the fields of mathematics, physics and chemistry, the backbone of Algeria's publication. On the contrary, disciplines as fundamental biology, medical research, and applied biology-ecology exhibit the highest shares with respectively 79, 6%, 68, 0% and 70, 5%.

Table 7: Share of International Co-Publications in the Publications (1993, 2001, 2004 And Evolution); Comparison With Other Countries

Share (%) of international co-publications								
Algeria						**South Africa**	**Chile**	**Thailand**
Discipline	**1993**	**1999**	**2004**	**Evolution 2004/1993 (%)**	**Evolution 2004/1999 (%)**	**2004**		
Fundamental biology	71,7	92,6	79,6	+11	-14	51,6	51,4	63,3
Medical research	47,2	57,3	68,0	+44	+19	41,4	35,9	52,7
Applied biology-ecology	58,0	64,6	70,5	+22	+9	38,2	44,2	66,7
Chemistry	71,0	69,9	63,7	-10	-9	40,7	47,5	55,5
Physics	65,6	63,0	50,1	-24	-20	58,2	55,0	60,3
Astro and Geo sciences	62,8	71,3	58,6	-7	-18	49,6	75,6	59,9
Engineering	57,3	55,2	49,8	-13	-10	33,1	48,0	52,7
Mathematics	65,9	54,1	52,5	-20	-3	50,7	65,4	42,3
Total	62,7	63,6	57,9	-8	-9	43,5	53,5	56,9

Source: Thomson Scientific data, OST computing

This unfortunate situation could be explained by Algeria's political turbulence in the nineties which has had a very bad effect on its relationship with foreign countries. The collaboration between Algeria and some countries with which it used to have strong scientific ties has, to a great extent, been affected. Researchers doing fieldwork have dropped out their projects, and several Algerian scientists have cut down their visits abroad. The researchers' main efforts were turned towards covering the university teaching needs particularly after the spread of university centres throughout Algerian cities.

1.2.4.2. Co Publication per Country

Co-publication per country is an indicator on the co-authors' geographical location. Collaboration might be developed with northern scientists as well as with southern peers. Collaboration with developed countries offers many advantages to third world scientists, mainly in terms of research facilities, knowledge update and funding. But collaboration with southern countries is not yet widely promoted. Which kind of geographical co-publication is Algeria developing? Which partner countries are collaborating with Algerian scientists and in which disciplines is this scientific collaboration much more fruitful? Table 8 below provides answer to these questions.

Table 8: Share of Algeria's International Co-Publications for the Top 10 Scientific Partner Countries (2001, 2004)

The top 10 scientific partners of Algeria (all disciplines)				
2001			2004	
Rank	**Country**	**%**	**Country**	**%**
1	France	77,3	France	76,0
2	Germany	6,2	Germany	6,4
3	Italy	6,2	USA	4,8
4	Belgium	4,4	Italy	4,2
5	UK	4,0	UK	4,1
6	Canada	2,6	Belgium	3,7
7	Morocco	2,6	Spain	3,6
8	Spain	2,5	Greece	2,3
9	USA	2,4	Morocco	2,0
10	Switzerland	1,9	Tunisia	1,9
Number of international co-publications		265		324

Source: Thomson Scientific data, OST computing

As indicated above, Algeria collaborates mainly with European scientists. It is only recently that Maghreb countries (Tunisia and Morocco) have made their appearance on the Algerian co-publication map. France is by far the first scientific

partner. Its share in the international co-publications is above 75%. Though still low, the number of co- publications has increased from 265 in 2001 to 324 in 2004. According to Zahlan (2000:5), scientists, lacking adequate national support, often seek to increase their level of international collaboration. He argued that this is especially the case in the North African countries where the rate of collaboration with OECD (Organization for Economic co-operation and Development) scientists during 1990-1995 reached levels approaching 70 and 80%. Conversely, Scientists in Algeria, Morocco and Tunisia exhibit a very low level of regional collaboration. Out of a total of 1,264 papers published in 1995; some 804 (or 65%) were in collaboration with scientists outside their own countries. Very surprisingly, of the 804 papers, there were only 11 involved scientists from two Maghreb countries. Of these 11 publications, only one did not involve OECD scientists and was conducted fully by North African scientists.

1.2.4.3. Co-Publication per Discipline

If we now turn to collaboration in the different fields of science, we can see that France is by far the first scientific partner of Algeria for all the disciplines (Tables 9 and 10). Fundamental biology is the discipline in which Algeria's co-publications share is the highest 87.8% and mathematics the lowest 41.3%.This situation could be explained by the fact that mathematics is a discipline in which Algerian scientists might have gained some experience and specialisation and are likely to develop new types of collaboration and create new links with worldwide research networks. But biology is a discipline in which Algeria is under specialized and scientists still need this type of cooperation.

Table 9: Share of Algeria's International Co Publications with its Top 5 Scientific Partner Countries (2004) for 4 Disciplines (Fundamental Biology, Medical Research, Applied Biology and Chemistry)

Algeria : the top five scientific partners in 2004								
Fundamental biology			Medical research		Applied biology ecology		Chemistry	
Rank	Country	%	Country	%	Country	%	Country	%
1	France	**87,8**	France	**77,9**	France	59,7	France	82,2
2	Tunisia	8,1	Egypt	ns	Spain	10,4	Germany	9,0
3	Spain	ns	Spain	ns	Italy	9,0	Spain	3,8
4	Morocco	ns	Tunisia	ns	Belgium	ns	UK	2,3
5	Belgium	ns	UK	ns	UK	ns	Italy	2,3
Number of international co-publications		25		23		22		133

Source: Thomson Scientific data, OST computing OST 2007

Table 10: Share of Algeria's International Co Publications with its Top 5 Scientific Partner Countries (2004) for 4 Disciplines (Physics Astro and Geo Sciences Engineering and Mathematics)

Algeria : the top five scientific partners in 2004								
Physics			Astro and Geo sciences		Engineering		Mathematics	
Rank	Country	%	Country	%	Country	%	Country	%
1	France	78,5	France	80,4	France	68,5	France	41,3
2	Belgium	7,2	Italy	7,8	UK	7,0	Greece	23,8
3	Germany	7,2	Belgium	5,9	USA	6,6	USA	17,5
4	USA	5,2	USA	5,9	Germany	5,7	Poland	ns
5	UK	4,6	UK	ns	Italy	3,5	Saudi Arabia	ns
Number of international co-publications		79		34		76		21

Source: Thomson Scientific data, OST computing OST 2007

The 90's have not been a suitable period for international collaboration for the reasons we explained above. We can notice that during that period Algeria was totally cut off from the research world. France has remained the sole partner in all

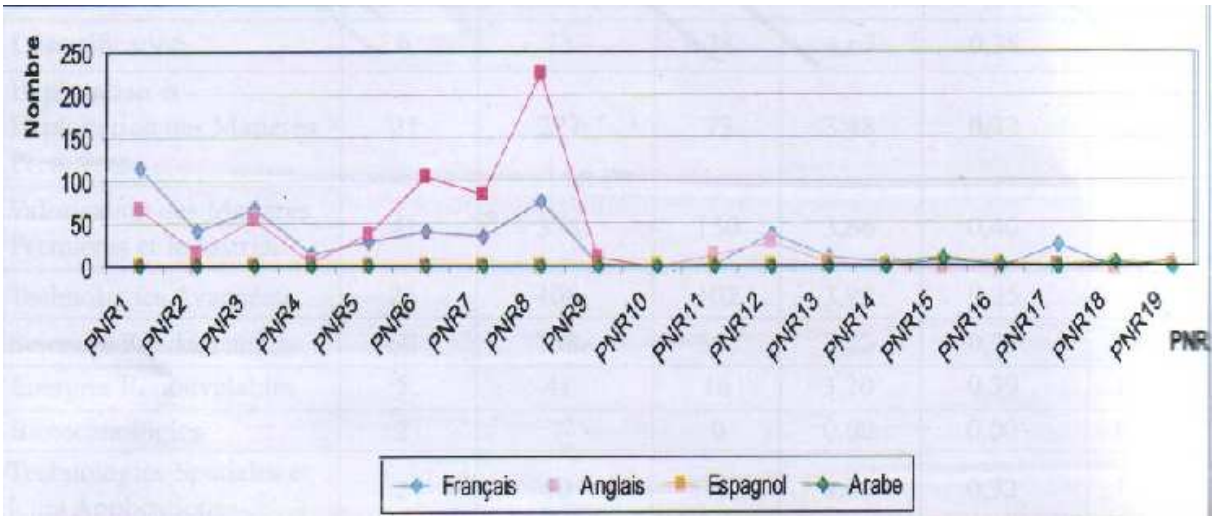
disciplines. This is generally explained by the political and economic reasons; but we believe that linguistic ones do have an important role to play.

1.2.5. Algeria's Languages of Publication

The languages in which Algerian scientists write and publish their articles in are an important indicator. Besides showing how the global scientific production is linguistically distributed, they are revealing of the scientists' individual choices and their capacities to use foreign languages. They are also indicating on why some languages are more preferred than others in certain disciplines. But in the present context, the prevalence of one language over other languages might be determined by the scientists' endeavour to reach a wider audience.

Figure 10 below shows how the most prevailing languages in Algeria's scientific production are disseminated over the publications produced by the national research projects. These projects cover a wide range of disciplines (19). The total production counts 1410 articles published in both domestic and foreign journals; noting that more than a half 53, 46 % is published domestically; 46, 54 % is printed abroad and 07, 18 % in the Arab world ,as already stated above.

Figure 10: Distribution of Languages in Scientific Publications



Source: ANDRU- La production scientifique issue des PNR 1998-2003: Analyse bibliométrique, 2008.

According to the ANDRU study (2008:48), English is the main language of publication. It represents almost half of the total publications with 681 articles, French ranks second with 528 articles, Arabic comes next with19 articles, and Spanish ranks last with only one article. The two major languages account respectively for 48% and 37% of all total production.

Because of the editorial bias discussed earlier, which tends to favour English language publications, more Algerian scientists now are publishing their results in English written journals. This can be observed in the fundamental sciences (PNR 8) which has reached the highest peak (227 articles in English against 76 in French), and where local scientists are the most visible.

On the other hand, Rostaing, H; Leveille, V. & Yacine, B. (2001) found that French is more dominant in subject fields dealing with Nature, Environmental Sciences and the Medical sciences. The choice of the language of publications of Algerian scientists, they explain, has a lot to do with the researchers 'ability to master the French language and with the well established scientific bonds that have tied the two countries before and after the 70's.

Conclusion

The statistical data presented here seem to suggest that Algeria's share for the global research publication output is trivial. The marginalization of Algeria from the world of science is clearly established. Despite the scientists' endeavour to increase their productivity, more efforts are needed for the country to create a research space in the international scene. The country is still at the foot of the ladder, and the charge for

access to the research world is extremely high. Various reasons behind this under representation are to blame. One of these might be the lack of political commitment in the area. Algeria's investment in research and development is insignificant, some 0, 3% of the country's GDP, and its scientific output mirrors its expenditure in the area. Another reason could be attributed to the shortage of human resources. With some 400 researchers per million inhabitants, Algeria produced less than 1% of the world total publications. Compared to developed countries where the average level of human resources is a little more than 3,000 researchers for every million inhabitants, Algeria's human potential is rather insufficient. There is also the suggestion that this deficiency results from the massive 'brain-drain' of qualified personnel that left the country before but essentially in the 90's. Algeria's hard times and political turbulence during the past decade have greatly affected its stability. All these reasons are certainly decisive, but one cannot reject the idea that language barriers, linguistic bias and editorial prejudice have contributed a great deal to strengthen its isolation and weaken the Algerian representation in the world of science (France remains the only one essential foreign partner). If anything is to be done to intensify the scientists' international participation, we believe, this should primarily begin by awarding more interest to the language issue as an essential prerequisite for the development of scientific research. Chapter two is a review of literature on how the language of science, with a particular reference to science writing in English, has been dealt with in the area of applied linguistics.

CHAPTER TWO

Approaches to the Study of Science Writing

Introduction

Throughout the last quarter of the previous century, writing approaches have witnessed 'bewildering' changes: from product to process… then social contextual and social constructionist models. Almost every decade has been marked by the emergence, the dominance, and the decline of a particular approach; noting that never had any of these totally faded away.

Writing approaches, with their respective focus on text, writer, reader and context, have often mirrored an influential view, theory or ideology[5] that marked a particular field or period of time. Also, these different perspectives, with varying degrees, have triggered a considerable body of literature that implemented ESL classroom instruction and given rise to an increasing interest in writing research. "Second language composition textbooks abound…approaches to teaching L2 writing exist in plenty…" echoed Krapels (1990:37).

The intellectual profusion in this research area has been so dense that almost no one can ever claim making an exhaustive account on what is there. Nevertheless, such contributions, as Raimes' (1991), Johns' (1990), Grabe and Kaplan's (1996), remain a sound board that helps us surf in this maze of non-ending controversial issues; where fluency outstrips accuracy, where process thinking defies product

[5] Allied with social contructivism is a political ideology which is left wing or Marxist in nature and which provides a major part of the pedagogical framework for the theory (Berlin,1988)

modelling and where the powerful community absorbs the very existence of the individuality. It is against this background of dual entities that the chronicles of writing approaches develop.

The purpose of this chapter is twofold: First it is meant to review diachronically the major trends in the theory and research on writing, providing each time tentative answers to the impetus that prompted the different changes. Second, it is intended to illustrate how the different theoretical perspectives influenced the study of scientific discourse. Concern has shifted from scientific texts to science writers then to scientific communities. In bringing together both theory and research issues, we not only aim at laying the theoretical foundations for our study, but we also seek to contextualize our research in a wider applied research framework.

For definitional concerns, and unless otherwise stated, the term 'approach' has been used consistently to refer to the guiding theoretical assumptions upon which the notion of writing is based. The 'textual' or 'product' approaches have been used interchangeably to stand for the same concept. Similarly, the labelling of 'psychological' or 'process' approach refers to the same notion.

2.1. The Textual Approaches and the Study of Scientific Texts

Interest in the linguistic study of scientific texts was prompted by the requirement to cover the academic needs of a great number of NNS students, who swarmed to English and American universities during the seventies' and eighties' decades, seeking to graduate in their specialized disciplinary fields. ESP classes emerged from these contexts and developed throughout the world, gaining a disciplinary autonomy as far as content is concerned, but their methodology has remained a debatable issue for a long time. The breeding milieu for ESP instruction has been the general English

classes from which approaches, methodologies…. have been borrowed. The textual trend, which was the dominant approach in the writing field, contributed a great deal to enhance the study of scientific texts and textual approaches have also been the guiding assumption to many ESP textbook and course designers What does this approach entail? In what ways it has been a useful resource for the study of scientific texts is what we shall report on in the next section.

2.1.1. Writing as -a- Product: The Principles, the Aims, and the Procedures

The 'product' approach is an umbrella term that embraces both the textual and the rhetorical models launched in the sixties by the proponents of this trend to develop the writing skill. In both situations, focus is put on the formal properties of texts or the 'products'. In one instance, greater concern is given to grammatical or syntactic accuracy; in the other, rhetorical organization is the prevalent aspect of writing. Thus, the purpose of writing in these instructional contexts, as labelled by Raimes (1987:36), was respectively for "reinforcing", for "training" in grammatical patterns, and for "imitating" rhetorical models.

2.1.1.1. Writing for Reinforcement

The most influential source for this model can be traced back to the "audio-lingual method", which was the prevailing mode of language instruction. The method is based on the assumption that language is primarily speech, implying that "writing served a subservient role: to reinforce oral patterns of the language" (Raimes 1991:408.). In the writing class, the learner was taught language forms through a variety of sentence drills, embodied in completion, conversion, and transformation

exercises. In some instances the learner was required to supply a linguistic element in a syntactic framework (prepositions, articles etc.); in others, he was asked to change the form without altering the meaning or vice versa (from passive to active or from present to past). But the writing task was only meant to support the oral task and the accurate usage of grammar.

Despite their wide range of forms, these structural drills, all point to the same pedagogical aim: provide learners with an extensive mechanical practice that fosters their correct sentence construction. The proficiency was judged by the learner's ability to manipulate language units accurately and correctly.

Raimes (1987:38) warns against the danger of too much concentration on this type of writing. She argues that when the learners become fluent and more skilled in English, their focus on accuracy will inhibit their production of ideas. And Widdowson (1978:115) provides the most extensive and critical survey of these exercise types, pointing out the limits for this instructional pattern. He laments that the learners operate on sentences in isolation; that they are more concerned with how the system of the language works rather than with its communicative purposes; that they are enhancing the learner's language "usage" rather than his language "use". He summarizes his view by stating that learners are given opportunity to "develop their composing skill without regard to the part that this skill plays in writing ability" (ibid). On some other occasion, he even questions the effectiveness and significance of such courses, as reads in this joint thought: "In fact, there is little evidence that such remedial courses are any more effective than the courses which they are intended to rectify" (Allen and Widdowson, 1978:58).

2.1.1.2. Writing for training

Unlike the previous model, which was meant to reinforce isolated grammatical patterns that learners acquired orally; writing for training was intended to give learners practice on longer passages of connected discourse. The students were taught to operate on extended pieces of discourse and to make meaningful relationship between them. But, since the focus was the product and the concern accuracy, the learners continued to manipulate linguistic forms within the boundaries of the text. The most typical of these models is the *controlled composition* task, for which Silva (1990:13) offers this comprehensive picture.

> In the controlled composition… learning to write in a second language is seen as an exercise in habit formation. The writer is simply a manipulator of previously learned language structures. The reader is the ESL teacher in the role of the editor or proof-reader, not especially interested in quality of ideas or expression but primarily concerned with formal linguistic features. The text becomes a collection of sentence patterns and vocabulary items - a linguistic artefact, a vehicle for language practice. The writing context is the ESL classroom.

Unlike free composition, whereby the writer is the genitor of the text; controlled- composition is an activity, which does not allow creativity. It constrains the learner to write within set boundaries, imposed by a given framework. The syntactic patterns to be used are supposed to have already been acquired and the lexical items are already known. Because the activity is meant to make the learner avoid errors caused by mother tongue interference, personal ideas and free expression are downplayed giving way to textual accuracy and sentence correctness.

The controlled composition exercises, might have offered useful language training to learners; but they have, in no way, helped them practise real writing and produce authentic texts. Students managed to write in an “acceptable prose”, but their writing remained unnatural, repetitive, and ineffective argued the opponents of

this method. For Widdowson (1978:116), as long as the learners' concern is accuracy; they "need pay no attention whatever to what the sentences mean or the manner in which they relate to each other". And for Zamel (1982:195), since the focus is still on the product, the usage, the structure, the correct form, the learners would never be made aware of "the enormous complexity of writing".

2.1.1.3. Writing for Imitation

Writing for imitation aims at providing learners with a given framework which helps them write correspondingly. The purpose is to encourage the learners to reproduce syntactic forms, as well as rhetorical patterns of selected models. The focus is on the logical construction and the arrangement of information in paragraphs; passages and even across languages. Attention is given to the various options for developing discourse.

Since Kaplan's 1966 breakthrough in *language learning*[1], greater concern was given to contrastive rhetoric and the rhetorical organization of texts. According to the author, each culture has its own way of thinking and how a person thinks largely determines how s/he writes (this relationship between language and culture is derived from the Whorfian hypothesis of language and thought). His argument is that ideas don't fit together in the same way from language to language; and his thesis is that, in order to write well in English, non-native learners should be first made familiar with how English speakers arrange their ideas. Once the English pattern is understood, it can be easily imitated. Unlike Semitic, Oriental, Romance and Russian languages, the English thought pattern is linear. In this way, English paragraphs open with a

[1] famous article on the rhetorical patterns of thoughts in intercultural education *language learning* 16, N° 1 and 2: 15

topic sentence, followed by some clearly related and orderly sequenced supporting material.

In the writing class, the learners fulfil the writing task by following guidelines about content and organisation. They are made familiar with the rhetorical forms perceived as typically English, weaning them from rhetorical patterns of their first language. For example in Bander's textbook (1971), the most prototypical material based on the model approach, students are exposed to the pattern of expository development which is said to be characteristic of the English prose. This linear writing consists of a topic statement, known as generalization and supported by examples and other methods of organizing information as comparison & contrast, definition, classification etc.

One of the disadvantages this method presents is depriving learners from the autonomy to express themselves freely. In fact, they are reproducing tailor-made material that their teachers believe most appropriate to them. Besides, very often their writing is assessed on how close they conform to the given guidelines; rather on how personal the work is.

The product approach has unquestionably enhanced the learner's formal accuracy and contrastive rhetoric developed his organisational abilities. Both are essential tools to effective writing. Nevertheless, too much focus on accuracy may dampen the development of fluency, as the proponents of the process approach would argue.

2.1.2. Textual Studies of Scientific Discourse

The product approach could be regarded as one of the most important sources which provided the study of scientific discourse with a large body of literature. Textual

features have constituted a great concern among researchers who analyzed various aspects, moving from the smallest units as pronouns, articles, verb forms, cohesion, coherence etc… to the broadest ones as research papers, reprint requests, lab reports. For many scholars, the product approach has been a source of guidance and inspiration for science writing research and teaching.

At the instructional level, the procedures we discussed in the opening of this chapter were regarded as well applicable to the teaching of scientific English classes, except that the content of texts was substituted by topics reflecting a scientific content. The practice was so commonplace that Kennedy and Bolitho (1984: 8) noted that in some of the earlier approaches to ESP, "scientific English can be taught through a general English syllabus with an overlay of scientific vocabulary." Thus transformation, substitution, and conversion models that we discussed in the earlier section have continued to implement scientific written material and disciplinary classes for quite a long time.

However, at the theoretical level, the characterization of scientific discourse has been marked by controversial issues. Much of the debate was centred on to the nature of scientific language. Does scientific language constitute a "universal mode of communicating"? (Widdowson, 1979:52), or does it represent a "language variety" which possesses characteristics of its own?

Many twentieth century linguists speak of scientific language as "a supernatural language". Sapir (1921:239) writes that "the proper medium of scientific expression is…a generalized language that may be defined as a symbolic algebra of which all known languages are translations." In line with this view, Widdowson (op.cit) echoes the same concern; He argues that "scientific *discourse* is a universal mode of

communicating, or universal rhetoric, which is realized by scientific *text* in different languages by the process of *textualization*". He assumes that:

- Disciplinary knowledge constitutes a "secondary cultural system which is independent from the primary cultural one". For example, although Japanese and a Frenchman have different primary cultures (different language, belief, and way of life…), as scientists, they share a common secondary culture.
- The conventions which govern scientific discourse are independent from any linguistic system. He maintains that the rhetorical principles (as cause and effect, comparison, formulation of hypotheses…) inherent to scientific knowledge can be found in a wide range of linguistic expressions.
- Scientific discourse is also realized in a variety of ways: Symbols, formula, diagrams…). "These Non verbal modes of communicating" he explains, "bear witness to this universality and the independence of science from primary culture systems as reflected in different languages".

On the other hand, research in various areas revealed that scientific language is the product of primary cultures. As Corbett (1992:39) put it:

> …scientific language is determined by the idiosyncratic practices of the various communities of scientists in the world. If one considers translation of articles from one language to another, one can notice that there is more to the task than the simple recasting of a universal "symbolic algebra.

Textual studies in various fields of science, as we shall report, provide empirical evidence that makes scientific writing distinctive from one scientific community to another. The problem lies not only in the textual features but also in the subtle different practices of distinct scientific communities. Thus, Scientific English is a 'language variety' which possesses characteristics of its own. The differences lie in the first instance in the lexicon, the grammar, the style, and the

discourse that is organized in an idiosyncratic way. Register Analysis, EST rhetoric, and contrastive rhetoric are the three main areas of study which account on such distinctiveness.

2.1.2.1. Register Analysis

In its early days, the study of scientific discourse has generally been concerned with the description of the formal properties of texts, known as "Register Analysis". These descriptions have dealt with the quantitative linguistic analysis of lexical and syntactic features that written text types display. For example, the verb choice, the passive voice, the complex noun phrases. The aim was pedagogical. Once identified, the most recurrent language forms were selected to constitute a syllabus or to make generalizations about a particular language variety. The underlying assumption is that language varies as the situation in which it is used varies. In other words, the formal characteristics of a text define its function. The following quote makes the notion clear:

> Registers… differ primarily in form…the crucial criteria of any register are to be found in its grammar and lexis ...It is by their formal properties that registers are defined. If two samples of language from what, on non-linguistic grounds, could be considered different situation-types show no differences in grammar and lexis, they are assigned to one or the same register… (Halliday et al: 1964:87)

A good deal of EST material produced in the 70's and early 80's is traceable to this concept, and many ESP anthologies such as Robinson (1981), Swales (1985b), McDonough (1984) offer a thorough account on these contributions. Because reviewing this entire work is beyond the scope of this thesis, we find it necessary to refer to what we believe the most representative of this trend: The earliest, the most relevant to our study and probably the most popular at that time.

The earliest of such investigations, worth mentioning, is certainly Barber's (1962) article: *Some Measurable Characteristics of Modern Scientific Prose*. As suggested by its title, the study uses a frequency count method to bring out the linguistic features that distinguish scientific from general or literary English. Barber investigated both the lexis and the syntax prevailing in the variety. His analysis suggests that the language of science has some specific features (lexis, sentence length, grammar etc.), For example, his study was the first to point out the absence of the continuous tense in scientific English. Despite the fact that his research was based on statistical counts, that his investigation used a reduced corpus, and that his findings were exploratory; his contribution provided useful comparative data, showing differences between specialized and general English. The study initiated a research tradition based on frequency analysis. Thanks to computer work, frequency count studies are revivified today and constitute major data base for many programs. Critics have pointed out that Barber's study is of interest not so much for the information it provides or the light it sheds on a scientific English style, as for its attempts at a statistical approach and its illustration of what should and should not be done in such an investigation.

The second EST material, we discuss, is undoubtedly the most popular. Ewer and Latorre's (1969) *A Course in Basic Scientific English* was published at a time when not a great deal of ESP/EST work was done and when much of the debate in the field centred on the nature of Language/s for Special Purposes. Working on a large corpus, covering different areas of science and using a frequency count procedure too, the authors have been able to challenge the debate raised earlier: ESP as a distinctive field from ELT. Their findings suggest that there is a basic language of scientific English (hence the title of the book), which exhibits a noticeable

variation from the typical school course. The differences are obviously found in both lexis and grammar. It was, for example, found that the “ing” form replaces the relative clauses and the infinitive form was preferred to longer phrases etc. Having established their assumption on safe grounds, the authors have materialized their findings into a teaching course for ESP students in Chile.

The third textbook, we ought to give tribute to, is Swales’ (1984) *Writing Scientific English.* The course book is partly representative of this trend (he adopted a grammatical /functional approach), but, for Swales, (1978:49), Writing Scientific English “is more of a grammar book than most EST courses before or since”. The contribution is worth reviewing to for two reasons. First, Swales’ work was specially designed for Arab students (Libyans), taking courses in a variety of scientific fields (Engineering, agriculture and science). By moving away ESP from the Western to the Middle East, Swales has given rise to a growing body of ESP research in the Arab world. Second, the book was primarily designed to improve the writing skill of science students and, therefore, is a good illustration of how the textual approach was implemented in writing courses. The textbook provides students with an intensive practice of the structure and the features of scientific English, essentially relying on the principles generated by Transformational grammar and syntactic theory.

Register analyses of scientific discourse have received an increasing attention. Both its grammar and lexicon have intensively and extensively been researched. Scientific discourse, as a language variety, exhibits certain linguistic and stylistic features that are unquestionably distinctive. The textual approach has contributed a great deal to its formal description; but no one can deny that it has proved to be too restrictive.

2.1.2.2. The Rhetorical Approach to EST

Taking a broader perspective than Register Analysis, discourse studies that inform this approach have been concerned with the functional uses of language in scientific communication. These studies are helpful in two ways: On the theoretical level, they help inform how different languages organize their written information. On the applied level, they help "develop the capacity of the science and technology learner to recognize how sentences are used in the act of communication and to understand the rhetorical functioning of language in use" (Mage 1981:93). Since the late sixties, many researchers, mainly from "The Washington School", have been concerned with the notion of rhetoric in EST. It has even become fashionable in ESP to study English varieties from the rhetorical point of view. The most significant research in the area and to which many ESP practitioners owe due credit is that of Lackstrom, Selinker and Trimble (1973:2). The authors pioneered in introducing the notion to the EST field. Rhetoric has been defined as follows:

> We define scientific and technical rhetoric as the process a writer writing scientific and technical English employs to produce a desired text. This process is basically the act of organizing scientific and technical information for specific purposes and for specific types of readers.

In response to the debate that marked the field on the nature of Scientific English; the authors argue that scientific prose bears certain rhetorical features that distinguish it from general English. The findings of their many studies show that:

– The notion of paragraph in EST differs from that of general English. The paragraph- as a series of sentences, forming a single unit of thought and marked by indentation- is misleading particularly for EST learners. Paragraphs in EST extend the boundaries of a physical paragraph.

– The “the conceptual paragraph” in EST proceeds in a linear way. It opens with a generalization called the core which is supported by one or more rhetorical patterns that develop it.
– The meaning and use of tenses, of articles and syntactic constructions in EST are determined by rhetorical considerations than by the rules of general usage.

The Rhetorical approach to EST caused considerable excitement in the field. The distinguished findings brought by the contributors of the American school were a real upheaval in the ESP field.

2.1.2.3. Contrastive Rhetoric in Scientific Discourse

As we explained in the earlier section, concern for the rhetorical structure of texts has extended the English language boundaries. The rhetorical organization of French, German, Finnish, and even Arabic… scientific texts has been compared to the English ones. These studies have, on the whole, been motivated by answering the question on whether there are absolute norms for the organization of scientific discourse, or whether this exhibits different rhetorical patterns across languages. The answer seems to lie between two extremes, as we explained in the opening of this section.

Widdowson (1979:51) argues that the language of science is independent of any linguistic system.

> … the concepts and procedures of scientific inquiry constitute a secondary cultural system independent of primary cultural systems associated with different societies.

He explains that an individual’s primary thought patterns do not influence his disciplinary culture. For him, a Chinese and a British may have different primary cultures; but as scientists, they share a common, secondary culture which allows

them to do things in the same way. In this way, their science writing in their secondary culture would not exhibit any differences, for the conventions that that govern science writing are universal. He goes on to argue:

> … The discourse conventions which are used to communicate this common culture are independent of the particular means which are used to realize them…scientific discourse is a universal mode of communicating , or universal rhetoric which is realized by scientific text in different languages by the process of textualization (ibid)

To be justified, this assumption calls for empirically based studies, which to our knowledge are scarce. However, intercultural research, emerging from different languages, runs counter this belief. Contrastive rhetoric studies show that discourse patterns are culturally determined, and texts produced by writers from different cultures are rhetorically different from English ones. In his studies, Clyne (1987 and 1991) examined a variety of German academic text types, produced by German-speaking scholars. His findings show that the broad rhetorical organization of texts and some of the ways of presenting arguments by English and German speaking scholars are different.

O'Regent (1985:107) disputes the "universality" of scientific discourse, but he finds it safe to say that the concepts which make up different disciplines may well be the same in a great number of languages. Nevertheless, he argues that "the various types of scientific discourse used in professional circles show clear differences in cultural attitudes to science and research". Using a comparative approach, the author examined the construction of 60 medical research papers written in both English and French. The author examined the rhetorical organization as well as the discursive and illocutionary strategies used by the writers. His results point to the fact that scientific discourse is not constructed in the same way in the two languages. He argues that

the main difference resides in the attitude that the two types of writers have towards the elements that make up the article. Whereas for French writers, it is the scientific data that must be given prominence; For English writers, it is the 'line of argument' that we give prime importance to.

Despite their wide range, these studies are not mutually exclusive. On the contrary, they represent the early trend which has given prominence to textual analyses. They represent different points on the same scale. Mostly, the shortcomings of one model have led to the shaping of the other; or more appropriately, the shaping of each of these models has been derived from or has been influenced by previous work. In a word, the textual studies of scientific discourse have developed from a micro to a macro level, providing a complete picture of the features that distinguish linguistic varieties.

However, if these models have helped describe the lexical, the syntactic, and the rhetorical features that some language variety possesses, they have proved to be unable to reflect on the communicative purposes conveyed by these texts types. These models were not capable of highlighting "why a particular text -genre is written the way it is" pointed out by Bhatia, (1994: ix). Because their scope did not extend the formal description, these studies have lacked the socio-cultural dimension, and they have failed to provide explanation on how social factors interfere in discourse construction and interpretation. In a word, textual studies were unable to tell what communicative purposes written texts have, how conventions and audience expectations determine the form of discourse. Science writing research needs new models that take into account the social grounding and the conventionalized aspect of discourse. What is sought then is a discourse model that compensates for the deficiencies brought by previous descriptions, that provides social explanation to the

linguistic elements. The ingredients of such a model began to emerge with *Genre analysis* as proposed by Swales (1990).

2.2. The Psycholinguistic Approaches and the Study of the Scientists' Writing Processes

Textual studies have been able to inform us that scientific texts display some specific linguistic and rhetorical features. These features typify the English variety, making scientific English differ from general English as well as from other linguistic varieties, as legal or business writings. In writing scientific English, scientists make use of a repertoire that they derive from a specific register, having its own lexis and grammar. But the psycholinguistic approaches main concern goes beyond the characteristics that written texts exhibit. Concern has shifted towards science writers, and interest was to find out whether the scientists' writing processes exhibit some idiosyncratic strategies. Moreover, research in the area sought to find out whether the native speaker scientists' writing processes differ from the NNS ones. In the second part of this chapter, we shall examine how the focus moved from the scientific text onto the scientists' writing processes, from the linguistic features to the writing strategies and processes; from English science writers to the NNS writers. However, for the sake of clarity, we shall begin with general considerations that paved the way to the cognitive study of science writing.

2.2.1. Writing As- A-Process: Definition and Major Lines of Research

> To teach writing, the writing teachers should teach the writing process; and to teach the writing process, they should know how to write. (Zamel, 1982: 195)

Guided by this assumption, dissatisfied with the traditional approaches- which could no longer meet the instructional requirements of the great number of students- and influenced by the major advances occurring in the area of cognitive psychology; 'the eighties' movement' has given rise to new voices that shifted the focus of writing from the text onto the writer. Writing instruction was no longer approached monolithically. The model-based pattern that urged writers to write on certain rhetorical patterns of expository writing, to develop a selected set of topics, to follow a given format, and to use a particular range of structures was no longer thought to be efficient. Instead, teachers were urged to give learners freedom and allow them self-expression. Learners were expected to enhance their writing fluency which has been obscured by too much emphasis on accuracy. In fact, in paying too much attention to the written product, issues of great concern as 'purpose', 'audience', 'voice' and 'process' have totally been neglected by both researchers and practitioners. Doesn't the very notion of writing entail understanding primarily why, how and for whom the writer writes?

With the advent of cognitive psychology, new lights were shed on the mental processes by which the human mind works, and by the same token new psycholinguistic interests began to emerge. This has led researchers in both reading and writing fields to regard these language skills as appropriate areas for cognitive inquiry. "What is it that the successful reader does to understand written language? " (Mackay *et al* 1979: vii), and what do writers actually do when faced with the daunting task of composing? Are the two recurrent questions, which reading and writing psychologically orientated investigators, have tried to find answers to.

The process approach, therefore, focuses not so much on the text or the written product but on the 'process' and the strategies employed when 'the writer' goes to

produce texts. Researchers seek to investigate the writing act itself, i.e. how writers write. It is what Markel (1988:509) defines as: "the study of the way ***real*** writers ***really*** write ***real*** writing". According to Grabe and Kaplan (1996:87), the approach has developed the writing skill in many ways. It has encouraged:

- self discovery and authorial 'voice';
- writing on topics with relevance to the writer's interest;
- a goal directed activity, which requires planning out before writing;
- prewriting and re-writing tasks and multiple drafts with feedback on different drafts;
- a variety of feedback sources from real audiences (peers, small groups, teacher etc.);
- free writing and journal writing as alternative means for generating writing and overcoming the writer's block;
- Content information and personal expression rather than the accurate usage of grammar.
- the idea that writing is recursive rather than linear as process-tasks are repeated as often as necessary;
- Students' awareness of the writing process and the notions of audience, voice, purpose.

To understand how this approach has evolved, how it has gained its strength, how it has become so popular, we propose to review the major lines of research that contributed to give it the present shape.

2.2.1.1. The Expressivist Approach

The expressivist movement developed as early as the 60's, as a protest against the existing social order. America was living in a great series of revolutions and reforming the writing class was part of the whole process. The goal was to liberate learners from the academic trammels imposed by the product oriented writing instruction and also to react against the traditional values of correctness and accurateness required by the rigorous scholarly tasks.

Guided by their radical insights, the leading figures of this first wave of writing reformers (Murray, D. (1980); and P. Elbow (1973) and others) urged writers to liberate their voices from authoritative learning[6]. They encouraged learners to "express themselves freely and uncritically so that they can get down as many words as possible" (Elbow in Johns, 1990:25).

More than an innovative writing pedagogy, the goal was an artistic one. The 'authentic voice' movement urges the writer, to depict his 'inner' self just as the artist does with the outer world. "Writing is an art, a creative act in which the process-the discovery of the true self is as important as the product" wrote Berlin (1988:484). The aspirations and the expectations of these scholars are described by Grabe and Kaplan (1996:88) in the quote below:

> The goal, a romantic one…was to produce writing that was fresh and spontaneous and had integrity. Writers should say what they really thought; they should be creative and take chances. Writers should let their natural voices speak out.

The classroom methodology, as shown above, reflects the philosophy of the movement. It is "non-directive" (Johns, 1990:25), promotes fluency and encourages self-discovery. Murray (1980:4-5) explains that it is by writing and rewriting that

[6] *Writing Without Teachers*, (1973); *Writing with Power: techniques for mastering the writing process* (1981). These are two titles of Elbow's writings, revealing the radical character of the movement

one explores his thoughts and gets closer to the "discovery of meaning". It is by a continuing "rehearsal" that a writer discovers what he wants to say, that he approximates the intended meaning. Learners are urged to develop reflective journals and free essay writing that generate personal accounts and liberate the writer's block. From this perspective, 'writing' is viewed as "a process of exploring one's thought and learning from the act of writing itself what these thoughts are" explained Zamel (1982:197).

Despite its innovative aspects, the approach was criticized on theoretical and methodological grounds. The approach lacks theoretical grounding and needs a methodology. The focus is individualistic and the goal unrealistic. Its limits could be summed up as follows:

- For North, (in Grabe and Kaplan 1996:89) "The authentic voice leaders were guided by pragmatic insights into the nature of good writing and writing instruction". He regrets that "their advice amounts to recounting what worked for them as good writers and what should consequently work for others in the classroom".
- Bizzell (1982: 192), on the other hand, deplores that the approach treated all the differences between learners simply as a matter of innate and individual abilities. The students' thought processes and their various social circumstances were ignored.

Nevertheless, it should be acknowledged that the expressivist approach brought real changes to the writing class. The new ideas, this movement brought, helped open the door to more substantial approaches.

2.2.1.2. The Cognitive Approach

More than the expressivist line of research; the ‘cognitivist’ movement, or what we generally refer to as the “problem-solving group” (Johns, 1990:25), has had greater influence on the writing process research. Emig's contribution (1971) was considered not only as a pioneering work in the field, but as a major breakthrough in the area. *The Composing Processes of Twelfth Graders* is said to have marked the shift of orientation from writing as product to writing as process. Three advances are to be mentioned:

- The study has opened up an era of scientific inquiry, based on case study approach and think aloud methodology; breaking up with the standard experimental design.,
- It has challenged the view that sees writing as a linear process that starts in one place and finishes in another. Rather, writing is a series of recursive and circular steps, whereby revision plays an important role.
- It has disputed the traditional, static plan-outline-write procedure to speak of a dynamic and idea-developing process: “meaning discovery”. It is by writing and rewriting that one achieves what he wants to say, and that one generates and creates ideas.

Following the same line of research, both Perl (1980) and Sommers (1980) have contributed to expand these findings. They investigated the writing strategies developed by skilled and unskilled writers, focussing respectively on the acts of writing and revising. They reported that writers exhibit different strategies: while the proficient writers' concern is global, paying due attention to meaning and information structure; inexperienced writers’ focus is rather mechanical; spending more time chasing vocabulary and grammar mistakes. These “premature rigid attempts to

correct and edit their work truncate the flow of composing" (Perl 1980:22), and destroy the so much demanded process of discovery.

Although the approach was generally approved of, and research in the area had been growing so rapidly. The method had not escaped to criticism. Like the expressivist model, the cognitive approach lacks a theoretical back up, and many attempts were launched in order to fill in this gap. Writing researchers turned their attention to the Piagetian theory to derive models from the cognitive development field. One illustrative example is Flower and Hayes' model (1981).

2.2.1.3. The social cognitive Model

Flower and Hayes' (1981) model is an attempt to conceptualize the cognitive writing process. The model derives its theoretical foundations from previous research, accounting for the various data, and the conflicting views. The model rests on these hypotheses:

- Writing is a process which consists of several recursive and interactive steps: planning, writing, reviewing, revising and editing
- Writing is a purposeful activity which consists of turning plans and thoughts into words
- Writing is a process which differs from skilled to unskilled writers.

The suggested research methodology for this approach is based on protocol analysis, which is derived from its parent field: cognitive psychology. Thinking-aloud protocols consist of collecting and examining samples, transcripts and videotapes of writers talking aloud while writing. Unlike a retrospective account, protocols offer a record of content and focus of thought as the writers concentrate on the task they are performing. The protocol record is more detailed than any account a

writer could recall retrospectively. Besides, it captures conflicts, contradictions generated during the thought process but hardly ever mentioned once over.

The model is a schematic description of the composing process. It is made up of the different components, factors and stages that interact to generate the written text. In particular, the authors describe the stages involved in the process: planning, translating and reviewing and explain how these different phases are controlled. Finally, the model displays the elements that impact on the composing process; these might be stored in the environment in which writing takes place.

It is worth pointing out that although this model was basically cognitive, with *thinking* and *process* as key elements it did not discard the social factors (environment) as influencing elements in the writing process (hence the concept of social-cognition). The argument, for Flower (1994) is that a comprehensive theory of writing needs to recognize the various social factors which influence writing. It is asserted that any theory of writing that disregards any major component -cognition or social context- will be inevitably inadequate.

Flower and Hayes' model was generally regarded as a useful contribution. It has, nevertheless, generated some criticism which could be summarized as follows:

- Cognitive abilities and processing strategies vary from one writer to the other. In this respect, we cannot speak of a single processing way but of numerous processing ways.
- The model is too vague. No reference is made to how the text is constructed and what linguistic constraints are imposed on its production

– Protocol analysis has limitations as a valid research methodology for the study of writing. This research instrument can reveal certain things but cannot be considered as a primary source of evidence for a theory.

Despite the above mentioned criticism, the model is still regarded as an important contribution in the area of writing research. It has helped the theoretical and methodological debate on writing to move long steps forward. Undeniably, the psycholinguistic approaches, as a whole, have been useful in many ways. They have encouraged free writing and self discovery; they have emphasized purposeful activity, invented prewriting and rewriting tasks, and developed the learner's awareness of the writing process. It has been an innovative pedagogy, indeed. But it has also generated critics from traditional and social camps. Horowitz (1986:446) raises four pedagogical concerns:

– The multiple drafts pattern might not help prepare the students for essay examination.
– The peer evaluation does not help student get a real evaluation of their abilities.
– The image of good writers offered to poor writers is certainly questionable as far as learning efficiency is concerned.
– The approach is suited only to some writers in some academic tasks.

What seems to arise from these critics is that the process approach, by focusing too much on the psycholinguistic aspect it has failed to account for the other important factors that impinge on the writing act.

2.2.2. The Writing Process of Non-Native Speakers

The writing process approach has generated theories, developed a well established body of research, legitimized a research methodology …In a word; it has cleared out the ground for further investigations and to a certain extent settled down controversial issues. It is common now to treat writing as a process. It is also an almost absolute truth to deal with writing as a series of recursive steps than a linear process. Research on non-native speakers' writing processes has gained a lot from this. As a result, studies in the area are plentiful. Even though, the findings of some studies do not always corroborate with others. Generally speaking, results concur and investigations have brought new knowledge and raised important questions.

In a critical study on second language writing process research, Krapels (1990) investigated the extent to which this approach could be efficient for NNS. After reviewing the existing literature, the author set out to assess the common trends that support these studies. According to Krapels (ibid), these studies have overwhelmingly relied on case study approach, reproducing research designs developed for native writers and using similar research instruments (audiotapes, videotapes). These studies have relied on the same restricted number of subjects (the number that a case study approach can allow). The subjects have often been observed while they were performing a variety of academic writing tasks and composing on various topics. The research findings of these studies, though sometimes contradictory, raise important issues. In the light of the drawn conclusions, we tried to find answers to these three questions:

- Does the writing process of non-native writers differ from that of native ones?
- Do the non- native writers exhibit other strategies than the ones developed by their native counterparts?
- Is there any correlation between native and foreign language writing?

2.2.2.1. The Writing Process

Surprisingly, the answer to the first question seems to lie between two extremes. Until the mid eighties, the difference between the native and the non-native writing did not seem to be at issue. On the contrary, there seemed to be a large consensus on the question. All evidence points to the fact that the non-native writing process does not exhibit differences from the native composing. For example, Jacobs (in Krapels, 1990:43) found that there were no significant differences between the native and non native writers. In other words, the writing processes of L2 writers were similar to those of L1 writers.

Zamel (1982:199), describing "the composing process of proficient ESL writers" has also mentioned that there were no major differences between her eight non-native writers subjects writing processes and native writers' described in previous literature. However, she pointed out a rare instance among her subjects. The most "proficient" writer admitted writing first in her own native language and then translating into English. For other subjects, translation was only used when the writers were stuck and did not want to lose the thread of their thought.

Even though these assertions might be regarded today, as hasty generalisations, or as taken for granted appreciation; these assumptions have, nonetheless, marked second language writing researchers' belief until thoroughly researched studies were undertaken in the area.

Whereas, these and other studies pointed to the similarities between the two types of writers, Raimes' (1985, 1987) further investigations revealed differences, in behaviour, in strategies and in the process as a whole. NNS writing differs from

native composing: These differences could be attributed to cultural and linguistic backgrounds.

2.2.2.2. The Writing Strategies

Most reviewed studies point to the fact that non-native writers (mostly unskilled ones) developed a common strategy to compensate for their linguistic deficiency. When faced with a language difficulty, they resorted to borrowings from their L1. However, such a strategy is not specific to non native English writers. Studies in the area of second language acquisition research show that both speakers and writers all across cultures and languages do make use of this technique, known as "communication strategy". This has been defined as "an attempt of the learner to express his meaning in spontaneous speech with an inadequate grasp of the target language system" (Corder, 1983:15). Learners in second language writing, were reported to have resort to this strategy which falls within two types: Language switching and negative transfer

- Language switching occur when the learner uses a native word or expression into a foreign language, to compensate for a difficult or an unknown foreign language form.
- Negative transfer: Unlike "language switching" in which the learner borrows an item from his native language to use in another language, in negative transfer, he uses a native language meaning for an already existing word in the target language. Such a shift results in inappropriate and incorrect utterances and sentences.

According to Lay (1982), her subjects incorporated the first language into their second language writing, and the switch is made apparent when writing is on culture

bound topics. Similarly, other researchers observed that the lack of vocabulary resulted in first language use: Martin (in Krapels, 1990:46) indicated that her subjects had recourse to Spanish and exhibited two writing strategies: a language mix and translation. However, whereas Lay (1982) praised the use of L1 in L2 composing. The produced essays were of better quality particularly in terms of generating ideas, planning and organizing; other researchers, as Krapels (1990) raised the problems resulting from the use of this strategy.

2.2.2.3. The Impact of L1 on L2 Writing

Research in the area indicated that differences in cultural, educational and linguistic background do have effects on the L2 writing processes. Studies in the area concluded that:

- Non native writers, tend to use their first language in some way or another. While skilled writers use L1 to help generate ideas; unskilled writers rely heavily on it: to borrow vocabulary, to check style, to structure ideas etc.
- The writing and revising strategies remain consistent across languages. the same strategies are used by writers regardless of linguistic background is. These strategies are mostly consisting of borrowing of native words and translation.
- Certain topics lend themselves more to the use of L1. Culture bound topics are the most appropriate for such a transfer

– L1 writing behaviour is transferred to L2writing. The composing process in the native language is reproduced when writing in a foreign one. That is, poor writing in a second language is due to poor writing ability in the native language; and successful writing is attributed to proficient writing in L1.

The question of writing in a foreign language is a question of transfer of skills rather than of linguistic knowledge. The difficulty results from composing ability rather than from language proficiency. This conclusion arrived at by research on foreign and second language writing, is somehow reminiscent of another controversy raised by Alderson (1984) where the reading skill was at issue. He questioned whether the reading skill was a reading problem or a language problem.

2.2.3. The Writing Process of Science Writers

The writing process of scientists is an area that seems to have been fully investigated as regards the number of titles bearing the words “writing” and “process”. In fact, the fallacy stems from the word “writing” itself. What is meant by the concept in one instance often changes in another. Very often, a '*How scientists write'* title suggests more a textlinguistic approach than a cognitive one.

If we now turn to the ‘writing process of scientists’ *per se* or process description, as really implied by the theoretical framework described above, not many studies emerge as compared to the amount of research carried out in other settings. The cognitive study of scientists and particularly the methodology advocated by the approach - think aloud protocol - is very difficult to achieve. Normal processes are said to be intruded upon, and many scientists, willing to try, end by “bowing out” (Rymer, 1988:218). Second, the Complexity of the task is

attractive neither to the researcher nor to the writer. It is almost impossible for a scientist to compose a whole journal paper while thinking aloud. As a result, the few studies undertaken have relied on other qualitative research instruments, as interviews and questionnaires. And the scant number of studies carried out has mainly reported on 'stored habits' rather than on what is actually happening in the scientists' mind. Three areas of investigation characterized these studies:

- The strategies developed by scientists to write their research papers.
- The nature of the writing process:
- The differences between professional and academic science writing**.**

In turn, we examine each of these aspects.

2.2.3.1. The writing strategies

Using interviews and writing samples, St John (1987) investigated how professional Spanish scientists produced their articles in English. The author studied the problems they encounter, and the individual strategies they exhibit while composing. Her results show that scientists have developed varied strategies depending on whether they are writing in one or the other language. When writing in Spanish, the scientists have recourse to translation, but when composing in English, they have developed different ways:

- write directly in their own English
- write from a Spanish outline
- build a "jigsaw" from using other articles

The author reported that scientists have mostly dropped out the translation strategy, as it was proved unsatisfactory. It involved too much time, and very often, it did not express the meaning they wish to convey. Because professional translators could not

be found easily, the scientists have chosen the strategy that gave them greater control over their work: write in English, using a Spanish outline. The process, she described, was rather recursive than linear, as the scientists went back and forth over their writing more than once, noting that the assistance of a language reviser was always a necessary stage in the process**.**

Unlike Spanish writers, reported on previously, Algerian science writers seem to have recourse to translation as a major strategy. Harouni (2005) brought up the issue in her study of Algerian medical writing. Though exploratory in the area, the study has shed light on important aspects relevant to language transfer in the translation of specialized discourse. In particular, she considered the negative transfer from French to English in abstract writing and its impact on cross cultural communication. Using a textual approach, she distinguished, classified and analyzed the type of errors that occur at the lexico-grammatical level. Her analysis revealed a wide range of strategies that abstract translators (the identity remains unknown) have developed. These vary from semantic avoidance and message reduction "undertranslation" to resource expansion "overtranslation". The results suggest that writers had recourse to morphological, syntactic and lexical transfer, which often resulted in inappropriate and incorrect English standards.

Language inadequacy, as described above, often leads to rejection when papers are submitted for publishing in international journals, argued Sionis (1995). The rejection of two articles written in English by French Scientists motivated the author to investigate the strategies developed by the two article writers when composing their papers. The author reports that the articles were rejected because of the unusual "argumentative process" that each scientist had developed. The line of reasoning was considered rather "ambiguous" by the journal reviewers who rejected the articles on

the grounds that the papers “lack of consistency” and there is a “discontinuity in the argumentative process”. Using an experimental method, the author tried to reconstruct the line of reasoning by asking two groups of French researchers to retrace orally all the stages involved in the process. The analysis shows that the NNS writers had resorted to two macro types of “communication strategies”. The first group tended to avoid language argumentation, substituting it by an excessive use of mathematical language. Their attempt to make their argument self explanatory through non verbal information made the argumentative section read as a series of isolated statements, lacking coherence between the various elements. The second group was having a preference to the use of “resource expansion” strategies as paraphrasing, switching and other devices which often resulted in linguistic errors and negative transfer from the native language.

2.2.3.2. The Writing Process

Defying most difficulties prompted by introspective methodology, Rymer (1988) has been able to answer the question of what scientists actually do while composing. Using protocol analysis, interviews and questionnaires, Rymer has thoroughly investigated the native scientists’ writing process. He has scrutinised the very detail in the process: the stages, the nature, the practices…

The study suggests that the scientists' composing is not atypical from other professionals; the scientists display a wide range of strategies, ranging from careful planning and outlining to right away writing. Their drafting habits range from “spew and revise” to “perfect first drafter”. Some of them just don’t look back until they have reached the end of the paper; whereas some others heavily rely on revising as a functional strategy. They just repeat planning ordering, reviewing… and even use previous papers as planning devices. Whereas some scientists take few days to write,

others stretch out their writing over weeks, months…In reality, the scientists use a range of linear and recursive processes which could be considered in no way as typical of a particular category.

2.2.3.3. Professional and Disciplinary Science Writing

The issue of professional writing was also taken up by Parkshurt (1990). The author examined the difference between proficient and student writers. Using a triangulated methodology (questionnaires, interviews and writing samples), she investigated the stages involved in the process. As hypothesised by the proponents of the approach, the study shows that the two categories of writers exhibit major differences in topic definition, in brainstorming, as well as in feed back and revision throughout the stages of the process. While the student's writing is basically individual; professional writing is collaborative in nature. In research writing there is always a primary source, the author, who is often assisted by other secondary sources, such as -co-authors, other scientists working in the same area…- who give feedback and provide revision throughout the process. The major implication this study pointed at is that while the process approach proved to be beneficial for beginners; it is however, inadequate for advanced learners who need a more efficient approach that caters better for their needs.

Cognitive studies of the writing process of scientists have not drifted as many studies as the textual ones. The nature of the research, the research techniques have made the task difficult. What these studies suggest, above all, is that the writing process of native writers differs from that of non natives. These latter rely heavily on strategies, which sometimes are hindrance than a solution to their problem.

Conclusion

Textual models have implemented the writing classes throughout the sixties' and seventies'. The eighties' have given way to expressive and cognitive models. These have not only freed self-expression, but they have gone as far as exploring the inner workings of the writer's mind. Linear writing does not exist, at least, in the real world. Writing is a recursive and complex process. It is a system of interacting components that work together to generate meaning. The writing learner is not a recipient that we stuff with language rules; rather, he is a meaning creator. Writing topics are not artificial; they are not imposed. On the contrary, these are real and they spring out of the writer intrinsic world. Science writers do not exist in an empty space; the way they write is not out of the ordinary. Their writing can be both linear and recursive. But their use of strategies depends on their familiarity with the language. NNS rely on strategies; but native speakers operate on individual choices. Insights gained from scientists' composing processes tell us that professional writing is collaborative and supportive from beginning to end; academic apprentice writing remains the product of an individual brain devoid of all the social factors that generate the writing act. In a few words, this is the whole story of product versus process controversy. Does all that suffice to settle down the writing turbulence? Certainly not, the dynamics of writing still goes on. In chapter three, we shall review the new developments that have occurred in the writing field: the social contextual models.

CHAPTER THREE

The Social-Context Approaches and the Study of Scientific Communities

Introduction

Without totally rejecting the notion of writing as-a-process; researchers from the social perspective, point out the limited usefulness of the cognitive models; and to a certain extent, lament their inadequacies to meet the students' academic and disciplinary demands. It is indicated that writing instruction at tertiary levels does not prepare well for writing in disciplinary classes nor does it do in the workplace; hence the need for a more meaningful approach.

Researchers, taking the social turn, (Faigley and Hansen, 1985; Herrington, 1985 …) began to investigate communities and to discuss the importance of enabling students to understand discourse communities' bodies of knowledge, conventions and practices. They began to study the writing process within the context in which it occurs, and to understand the relationship that ties the writer to the discourse community. Research from this perspective began to provide descriptions on how the discourse communities function, how they influence the written products and how they condition the writers' behaviour, attitudes and strategies. Studies have, on the whole, been concerned with understanding how writers learn to write in their disciplinary cultures, why certain forms of writing are more preferred than others, why certain texts are written the way they are, how the audience expectations affect writing, how human interaction influences writing, and how cultural values, shared norms, and beliefs shape writing.

Writing from this perspective is based on two premises: first, its study is context- bound. "Studying the writer without taking the many dimensions of context

into account is a little like studying animal life by visiting zoo cages", remark Beach and Bridwell (1984:6). And second, each context or discourse community has its own norms that govern its members' behaviour and practices, as this is clearly explained in Freed and Broadhead's (1987:157) quote below

> Each discourse community is a different culture and each has different rules. And, though each will use the English language and write the English language, the writing (and the attitudes about and behaviours during the writing) may very well be different

In this chapter, we discuss the theoretical foundations of this approach, and elaborate on these key issues. We then examine the two major lines of research and review the main studies in the area. In the first part, we shall report on how the social context study of writing has been dealt with in different disciplinary discourse communities. The second part will be mainly concerned with the social constructionist study of research writing in the scientific community.

3.1. Key Constructs

'Writing' and 'context' constitute the key constructs for this approach. We propose to offer extended definitions for these notions, and discuss them in relation to the concept of 'discourse community', the locus where writers and readers interact by means of texts.

3.1.1. The Notion of Writing as-A- Social Act

Researchers from the social perspective dispute the notion of writing as a 'product' of an individual that we study by introspective methods. They also reject the notion of writing as a 'process' divorced from its social and cultural roots. Rather, they view writing as "a social activity" (Reither, 1985:62), or "a social act" (Bruffee, 1986:784)

which is shaped by the social and rhetorical context in which it occurs. At the rhetorical level, writing is influenced by the writer's sense of audience, purpose and subject matter. Beyond the text, knowledge, values, and the practices that writers share in a given culture influence writing. Cooper (1986:366), one of the most outspoken precursors of the social view, argues that "writing is a social activity dependent on social structures…".The same concern is echoed by Coe (in Johns, 1990:27), who views the written product as a "social act" that can take place only within and for a specific audience. The essential argument, developed by Reither (1985:621) below, is that writing and context are inextricably bound.

> Writing and what writers do during writing cannot be separated from the social rhetorical situation in which writing gets done, from the conditions that enable writers to do what they do and from the motives writers have for doing what they do.

Thus, the social perspective sees writing as a product of social systems, as an outgrowth of community. Writers and written texts are constituents of a social network whereby each plays some role. Writers, as well as readers are members of a social structure who interact with each other in the system, by means of texts and according to shared cultural knowledge and norms. For Cooper: (1986:367-368), the whole writing enterprise can be compared to an "ecological system" which creates a network of connections that tie writers to their context, reminiscent of the relationship that ties organisms to their natural environment.

> …All the characteristics of any individual writer or piece of writing both determine and are determined by the characteristics of all other writers and writing in the systems.

Santos (1992: 4), argues that the very difference that opposes the writing theories resides in the worldview concerning the "relationship between self and

society". While the "cognitivists" value the notion of "individuality", proponents of the social perspective treasure that of "community". Whereas the former perceive the individual as independent from society, the latter argue that "a person exists only as a member of a group i.e. a "community" or "society". A quote such as the one below could be regarded as typical of the antagonism opposing the proponents and opponents of the two approaches: "What we normally regard as individual, internal, and mental is (actually) social in origin" (Bruffee, 1986:774-775).

From the statements made above, it may be inferred that the social movement not only praises the notion of 'community', but there is also the suggestion that 'community' is the source of all human creativity: "Reality, knowledge, thought, facts, texts, selves and so on are constructs generated by communities of like-minded peers" wrote Bruffee (ibid). Writing, as it appears in the social constructionist view, is a social construct, a product of ideology and social circumstances. Not only is writing context-based, but it is also socially constructed, as Bazerman and Paradis (1991:3) put it in their own words.

> More than socially embedded, writing is socially constructive. Writing structures our relations with others and organizes our perceptions of the world. By studying texts within their context, we study as well the dynamics of context building. In particular, by understanding texts within the professions, we understand how professions constitute themselves and carry out their work through texts.

3.1.2. The Notion of Context

The notions of writing and context are tightly related. Writing does not exist outside the social context. Written texts are produced and read in the social context. The proponents of the social view repeatedly observe that "writing does not exist in a vacuum" (Odell and Goswami1984:234), and that the study of writing cannot be

stripped away from its natural setting. However, contradictory approaches to the notion of context have blurred the meaning and role of context in the writing process. There seems to be little agreement about what context refers to and how the relationship between the two should be approached. Studies investigating this interaction have failed to adopt a common stance, resulting very often in conflicting rather than shared views. Whereas for some, context is an enabler; for others it is an impediment. For Brandt (1986: 145-146), the concept nestles within the Hallidayan theory of language use and can be equated with "the environment of language use", noting that such an environment primarily "consists of human interaction, from which things derive their meaning". The concept for Chin (1994:447) remains an unsettled notion which dangles between the "social situations where writing takes place" and the "mental representations" that texts may fulfil. As a result of these blurred definitions, studies on writing from the social context perspective vary from the resources available to the writer to the rhetorical awareness that constrains the written texts.

Chin (op.cit) distinguishes between the different uses of the notion by identifying two types of context: "contexts for writing" and "contexts of use". She argues that when the construct describes the context for writing, it has mainly been concerned with describing the human resources and their social interactions that obviously impact on the writing act. Studies representative of this trend, have investigated**:**

– The physical location where writing occurs with a specific reference to who is involved in the writing task, what the writing activities are, how the writing task is undertaken, how the roles are learned, and how the norms are acquired.

– The participants and their roles: How the participants function as local resources for the writers is certainly the area which has attracted the greatest concern. The reader /writer interface, in academic setting, is undoubtedly the most widely researched area.

However, when the concept refers to “contexts of use”, it is commonly equated with “rhetorical awareness”. It is what we generally refer to as expectations and conventions of *discourse communities*, as illustrated in genre studies. Though complementary, “contexts of use” differ from “contexts for writing” because their influential factors reside outside the physical world. These are rather “mental representations” which reflect the writers’ cultural beliefs, disciplinary knowledge etc.

Context, in writing research, has been characterized in many ways; but the notion has been used interchangeably to refer to both situations: On the one hand, it refers to the factors that reside outside the writer (resources available to a writer such as people, previous texts etc.). On the other, it refers to those factors that reside inside the writer (the social, cultural and personal beliefs, the conventions, the practices). Be they internal or external both factors influence the writer’s rhetorical and linguistic decisions.

3.1.3. The Notion of Discourse Community

The concept of “*discourse community*” is the result of multiple sources of influence. It is regarded as an outgrowth of the social view of language which has given prominence to the study of language within the social context. It is also considered as the product of the post-structuralist literary criticism movement which has removed speakers and writers from the centre stage to give consideration to the

social, historical and personal considerations. But essentially, the notion is the outcome of the influence of the work generated by Kuhn on *structure of scientific revolution* (as we shall explain in the section 3.3.). For writing research, it is a new line of inquiry besides the textual and cognitive approaches. The *discourse community* perspective (see section.3.2.) developed out of the social-context perspective as an alternative theoretical framework to the current theories about the writing process. In what ways does a discourse community differ from a speech community? What defining criteria distinguish it from other social groups? are the two questions we shall provide answer to in the following sections.

3.1.3.1. Discourse Community and Speech Community

Though Swales (1990: 19) provided various arguments to contend the equation of a *discourse community* to a *speech community*, it is nonetheless very difficult to avoid mentioning their symmetry when communicative uses of the language are concerned. Johnson's (1992:133) parallel when discussing the object of the *ethnography of communication* is quite revealing:

> Work in this field (ethnography of communication) centres on what a speaker needs to know to communicate appropriately in a speech community and on how such knowledge is learned and used. By extension, it might inform us about what a writer needs to know to communicate appropriately and effectively in a discourse community.

Indeed, one cannot deny the fact that a "*discourse community*" and a "*speech community"* are two social groups which differ in terms of their practices and communicative purposes of language use, and Swales' (ibid) distinctions are relevant to the point: a *speech community* is "a homogeneous sociolinguistic assemblage of people who share place and background" but a *discourse community* is "a heterogeneous socio-rhetorical assemblage who share occupational or

recreational goals and interests". Members in a speech community inherit membership; whereas a discourse community recruits its members by persuasion. However, it is also generally accepted that the two concepts have many to share despite their different purposes and their a-priori focus on different language modes: spoken and written. Their most important common ground is clearly the assumption that language is a social phenomenon generated by the context of situation; be this context cultural or disciplinary; that language use, or discourse is constrained by norms, be they socio-cultural, or disciplinary; that membership entails the sharing of a certain set of values and beliefs besides the sharing of 'certain language-using practices' (Bizzell, 1982:203.). Moreover, the most striking similarity seems to be expressed in Faigley's (1985: 238) definition whose view about 'discourse competence' is recalling of the concept of 'communicative competence' as defined in the *ethnography of communication.*

> The key notion is that within a language community, people acquire specialised kinds of discourse competence that enable them to participate in specialised groups. Members know what is worth communicating , how it can be communicated , what other members of the community are likely to know and believe to be true about certain subjects, how other members can be persuaded and so on.

A discourse community is therefore neither a substitute nor a 'subset' of a speech community. Both concepts have different defining criteria. Whereas the former is defined by the shared discourse its members use; the latter is more concerned with shared rules, shared patterns of use etc. Their similarity lies in the fact that both aim at identifying ways by which communicative competence is achieved whether in the spoken or the written mode. The concept of *speech community* is a model of analysis of language use in social groups which has been consistent as much on the theoretical level as on the practical one. Its equation to the

concept of *discourse community* is therefore more pragmatic and paradigmatic rather than contentious and controversial.

3.1.3.2. Conceptualisation of Discourse Community

Unlike speech community which has a long history, the notion of discourse community is relatively new. As we explained earlier, it is only in the late eighties' that it has been introduced in the writing field to accommodate the study of writing within its social systems. Though appealing to the social-contextual approach, the notion raises a number of issues. The first is of definitional concern: What is a discourse community? What defining features distinguish it from other social groups? The second is of organizational concern: How is membership acquired? Does membership require learning, training, or assimilation of worldview?

Rafoth (1988:141) pointed out the "descriptive" and "explanatory" limitations of the concept, relating those weaknesses to the difficulties identified in defining a speech community. He observed that neither the shared language nor the size of the community and not even the preferred forms of discourse could act as reasonable criteria for setting boundaries between communities. Communities are so diverse to the extent that it becomes problematic to determine their unifying bond. Swales (1990: 25-6) offered a criterial type of definition which allows to identify a group of people as a discourse community. Though still open to criticism, it is considered as a useful working tool. According to the author,

- A discourse community has a set of common public goals
- A discourse community has mechanisms of intercommunication among members. These include formal and informal forums such as meetings and conversations as well as communication channels ranging from newsletters to

more sophisticated means.

- A discourse community uses participatory mechanisms to exchange information. These mechanisms are intended to provide information and feedback.
- A discourse community possesses specific genres which vary according to the communicative situation. They help members achieve their goals.
- A discourse community uses a specific lexis: This is a particular type of jargon which disciplinary communities develop.
- A discourse community has a threshold level of members. These are both experts and novices. Endowed with the community expertise, experts help newcomers to socialise by transmitting their know -how.

In other words, Swales sees discourse communities are social networks that emerge in order to achieve certain common goals be they professional or recreational. Members in those systems share certain forms of discourse (genres) and develop certain practices that enable them to fulfil their set goals. Members acquire their membership through socialisation, but mainly through training and qualification. However, Swales argues that participating in a discourse community entails neither the assimilation of its world view, nor sharing its ideology; he rather believes that “commonality of goals” (Swales, ibid) remains the unifying link of discourse community members.

On the other hand, Bizzell, (1982) assumes that membership entails a particular ideological position. She rather sees the discourse community as a social institution whereby ideology affects the group's behaviour and relationships with others. In the definition below, she states her foci and her sources of influence:

> In the absence of consensus, let me offer a tentative definition: a 'discourse community' is a group of people who share certain language-using practices. These practices can be seen as conventionalized in two ways. Stylistic conventions regulate social interactions both within the group and in its dealings with outsiders: to this extent 'discourse community' borrows from the sociolinguistic concept of 'speech community'. Also, canonical knowledge regulates the world-views of group members, how they interpret experience; to this extent 'discourse community' borrows from the literary -critical concept of 'interpretive community'. (Bizzell in Swales 1990:29*)*

From Bizzell's point of view, it may be observed that membership in discourse communities is marked by two principles: The shared discursive norms, which regulate social interaction, and the "canonical knowledge". To illustrate this point, she called for the notion of "interpretive community" as developed by Fish (1980). Fish views the "community" as a "the locus of power" which both permits and constrains interpretation of texts. Readers interpret texts from the perspective of the community: the "canon"; and writers create reality according to the shaped ideology. Therefore, for Bizzell, a discourse community is an ideological institution which shapes its members way of thinking. It is endowed with some form of "power" and, as Foucault (in Bizzell, 1982: 197) sees it, this power is not exercised by individuals; rather it is implicit in the construction of its discourse.

Despite the conflicting views that divide writing researchers as regards a precise characterization of the concept, it is necessary to conclude that the concept lends itself to both an ideological and pragmatic interpretation. Writing researchers, though divided on what defines and what determines membership in a discourse community, are unanimous to identify discourse communities as social groups that are unified by discourse. Faigley (1985:236) maintains that members in discourse communities are primarily connected by "written texts", and Berkenkotter, Huckin

and Ackerman (1991) continue to argue that the very existence of discourse communities can be inferred from the discourse that their members use.

The social-context approach is not yet a well formed consistent theory of the writing process. Issues as ‘context’, or ‘discourse community’, which constitute the corner stones upon which the approach rests, still continue to raise contradictory issues. However, there is reason to believe that the study of writing from this perspective remains an appealing area of investigation that triggered a number of research developments, arising from various fields (ethnography, sociolinguistics…). The most relevant to our study are the theoretically and sociologically oriented perspectives: the discourse community approach and the social constructionist view.

3.2. The Discourse Community Approach

As stated in the opening of this section, interest in understanding discipline-oriented writing was prompted by the difficulties experienced by adult writers when entering new ‘discourse communities’. Studies in various disciplinary contexts have shown that writers in general and non native speakers in particular often have difficulties in meeting the discourse community expectations. The reasons, often attributed to this deficiency, is that previous writing classes have failed to prepare students for the kind of writing they would perform as part of their advanced academic and disciplinary learning. For the discourse community perspective, two areas of research need investigation: ‘disciplinary enculturation’ and ‘Genre conventions’. The former attempts to examine the processes of initiation and socialization that students entering discourse communities experience. The latter tries to “demystify” the cognitive structure of text genres. As a result, a wide range of analyses of written disciplinary discourse, and ethnographic descriptions of writing contexts ensued. We

note that most of these studies were developed as part of the requirements of the writing across the curriculum movement (WAC) in the States and the English for Academic purposes (EAP) programs spread throughout the world.

3.2.1. Socialization Processes into Discourse Communities

Membership in discourse communities is acquired through socialization. This process enables new members to learn the disciplinary culture, that is, the language, the roles, the behaviour, the practices, the norms…. Socialisation is achieved through 'enculturation', a process by which expert members pass on knowledge to neophytes through formal and informal training. This aspect of novice's training was depicted as "disciplinary enculturation" to refer to the apprenticeship training which students undergo as they make transitions from one community to another. (Jolliffe in Casanave, 1985:87).

A survey of literature shows that most of these studies took place in disciplinary settings, examined NNS writing documents and addressed an academic audience. The enculturation and socialization processes have mainly been concerned with investigating those aspects as learning to write in disciplinary cultures in the light of the discourse community expectations.

Berkenkotter, Huckin and Ackerman (1991**),** investigated the initiation of a NNS graduate PhD student into a research community (the Rhetoric Program at Carnegie Mellon). They examined the introductions he wrote to research papers as an evidence of the student's learning of the institutional norms as defined by the research community. Specifically, the researchers were concerned by finding out the extent to which a student, who does not share the rhetorical and linguistic conventions of a community, would be hindered by writing in an unfamiliar genre.

Like other studies in the field, the researchers used a case study approach, including participant-observation, interviews as well as linguistic analysis of the written products. Their findings suggest that transition from one academic culture to another involves a difficult passage and requires the development of some kind of communicative competence which is "indigenous to the culture". Such a competence involves "mastering the ways of speaking, reading and writing" (Berkenkotter et al, 1991: 211) which is proper to the disciplinary community. Also the authors raise the question on the type of training that best prepares a graduate student to enter a community. Finally, the authors stressed the importance of learning the values, beliefs and practices of that disciplinary culture.

Using a case study approach too, Dudley Evans (1992) investigated the supervisor's comments on drafts of a PhD thesis, assuming that such comments would be suggestive of the doctoral student's writing processes as well as revealing of the expectations and conventions of the research community that will read the final version of the thesis. His study was essentially based on genre analysis which he adapted to dissertation and thesis writing. His results, though restricted in scope, suggest that the changes made by the supervisor and which occur mainly at the linguistic and stylistic levels are quite revealing about the conventions of the discourse community which the supervisor belongs to and which the student is making his apprenticeship in.

Casanave (1995:87), on the other hand, questioned the validity of "the one way enculturation model" (the process by which senior generation of scientists passes on knowledge to senior apprentices). She argues for an approach that considers the other factors that impinge upon writing. Using an ethnographic methodology, she investigated how first year doctoral students in a sociology program acquired the

values and beliefs of their disciplinary culture and how they manage to fit into the community. Acting as a participant observer, Casanave audio taped all class sessions, interviewed students and faculty participants and collected written documents. Her study shows that students constructed contexts for writing predominantly from sources that touch their lives directly, people in their immediate environment, and the system of training they receive. She therefore called for a notion of contexts for composing that takes into account the “local”, the “historical” and the “interactive" factors that interfere in writing. Rejecting the notion of enculturation that relies exclusively on the acquisition of norms and conventions dictated by the discourse community, she proposes an approach that looks at the socialization process through a complex web of interactions.

Such an interaction has been materialized by Belcher (1994) who investigated the student/advisor relationship, as the students wrote their dissertations. The purpose was to find out the role that coaching plays to help the student enter their targeted discourse communities. The author examined three case studies of non native graduate students in different fields, trying to acquire membership in their disciplinary research communities. Using naturalistic inquiry, the researcher relied on a variety of data collection procedures including her own interactions with the students in the writing classes and interviews with both students and their advisors. The findings point to the importance of such a relationship as a determining factor in the professional success of some students and their successful initiation in the research community. It was found that the most successful type of relationship is the one that allows for collaboration and students’ involvement in the community. However, the students’ failure was attributed to the mismatch that exists between the community expectations and students’' representations of such expectations.

The community expectations are an issue that has been taken up by several researchers. Prior (1991, 1995) examined the contexts for writing in a graduate seminar. He looked at advanced levels of disciplinary enculturation. Specifically, how professors communicated their expectations through writing assignments, how students represented those expectations, how the assignments were negotiated, how the students fulfilled their tasks and finally how the professors evaluated and responded to the students' written texts. Using multiple sources of data (class observation and class documents; interviews with both professors and students, questionnaires; students' final texts with comments and grades on them and text-based interviews), the author conducted an extensive fieldwork in a university setting. His findings suggest that writing assignments are complex and socially situated, that disciplinary “enculturation” is marked by conflicts, that non native speakers face greater difficulties than native speakers, and finally that classrooms form different societies marked by their varied cultural and linguistic background than with shared values and knowledge.

Because disciplinary socialization is recognized as a complex process, Casanave and Hubbard (1992) investigated the kind of problems first year doctoral students meet when entering a research community as part of their doctoral candidacy. In particular they considered the writing requirements these students had to respond to, and how their writing was evaluated. In other words, the authors were interested in understanding the type of tasks, students were expected to fulfil as part of their doctoral initiation. Using a survey research methodology, the investigators examined the writing tasks and requirements, relying essentially on the eighty five returned questionnaires from the social and science fields in Stanford University. Their findings raise several pedagogical issues and propose the type of assistance

students in research settings need in order to meet the disciplinary expectations. They, for example, highlight the need for specific discipline writing instruction as well as emphasise the need for support writing classes for non native speakers.

Paltridge (1997) has approached the problem of socialization from a pragmatic side, an instructional side, as casanave et al (op.cit) suggested above. The author presents a program that prepares students for thesis and dissertation writing. The program aims at developing the students' awareness of the community expectations as well as providing them with the strategies that help them develop an appropriate proposal with relevant structure, purpose and content. Such a preparation is intended by its author to be a preparation for the students to carry out research in scientific communities they wish to join in the long run.

Shaw (1991) considered the dissertation composing processes of non native writers. His research was aimed at understanding science students' composing processes. To obtain qualitative data, the author relied on structured interviews. His findings propose some type of resources embodied in a number of composing techniques and strategies that dissertation writers need to acquire. His study emphasizes the importance of genre knowledge and the awareness of the audience expectations. The immediate aim of this research was to help non-native students overcome their difficulty with genre structure, but the ultimate goal is definitely to prepare the student researcher to carry out research in the community they would wish to join in the future.

Building up their research on the various issues, which these studies raised, Connor and Mayberry (1996) explored how a Finnish graduate student initiation into a PhD program in agricultural economics. The authors investigated how he constructed a term paper, getting support from his professors and fellow students. In

particular the study addressed the following issues: how the writing task was negotiated with the professor, how the student made use of the social resources to assist him with the writing task and how his student native language interfered with his writing. Using a case study approach, the researcher examined both the writing process and product. The results suggest that the student negotiated the writing task with his professor in an acceptable manner, got support from his native speakers fellow students, who were primarily used as language revisers. And finally, it was found that the student native language affected his writing. The study suggests that learning to write in a genre is a dynamic process which includes discussions with colleagues, within and outside the university. It also suggests that it is important to teach students strategies to use respondents as well as social resources.

Unlike textual and cognitive studies of the writing process, the social studies are multifarious. This survey of literature on writing from a social context perspective indicates that none of these studies has had the same focus; rather, these have investigated the process from its different facets. Despite their diversity, these studies point to the following major conclusions:

- The Socialization processes of NNS in the research writing community are a complex issue. The cause is often attributed to the discourse they are expected to use in Anglophone higher learning institutions. As a result, of their inability, NNS found themselves ‘marginalized’.
- The need for an “academic discoursal consciousness raising”, as Belcher and Braine call it (1995: XV). Neophytes, seeking membership in discourse communities, need to be made aware of the conventions of their disciplinary cultures.

– The acquisition of disciplinary writing competence, involves more than the knowledge of the rhetorical conventions. There are other factors that influence the writing act. There is a need to give due attention to other resources that exist outside the writing class.

While this research survey has greatly enhanced our understanding of the socialization processes into discourse communities, it remains limited in certain ways. Research has relied on sampling that mostly concerned instances of doctoral students in research settings. We believe discrepancies may exist between academic and professional research communities. The expectations of these latter may be more demanding. On the methodological level, these studies used a case study approach allowing little comparative work. Research in these contexts has given more attention to the social processes; linguistic analysis has not been given as much attention as it deserves.

3.2.2. Genre Analysis: An Exemplar of Discourse Community Conventions

In the previous section (3.2.1.), we reported on how writers learn to write in their respective discourse communities. The various studies pointed out that the acquisition of the communication competence is made successful when students are able to read, write and think as discourse community members. All stressed the importance of learning the norms, the values, the beliefs… of disciplinary cultures. They all indicated that the 'enculturation process' is achieved when writers acquire the discourse conventions that govern their text genres. In this section, we discuss how genre analysis studies have been able to uncover these discourse conventions and to show how the discourse community expectations are codified in these discursive norms.

Genre analyses, we are concerned with in this study, are derived from the tradition initiated by Swales (1990), and followed by many researchers in the field of ESP / EAP. These studies fall within two categories: research genres in academic settings such as research article abstracts, research article introduction and discussion sections, dissertation and theses introduction chapters, lectures, seminars etc. On the other hand, genre studies have also considered professional settings, investigating job applications, sales promotion letters, legislative and medical documents…

Analyses in this tradition have typically focussed on the rhetorical patterning of texts. The structure of text types is often described as being made up of a series of *moves*. Each of which may contain one or more steps. This cognitive structuring of texts reflects the deeply seated conventions which expert discourse community members have codified to transmit a particular communicative purpose.

Swales (1981), in his earlier studies of article introductions, has come up with a description that takes into account the content and structure of articles. He investigated a large corpus from hard and social sciences and found that research articles followed a regular and consistent four move rhetorical pattern. He schematically outlined it as follows:

Move one: **Establishing the field**

a. showing centrality of the topic or
b. stating current knowledge of the topic or
c. ascribing key characteristics

Move two: **summarizing previous research**

Move three: **Preparing for present research**

a. indicating a gap
b. question raising or

c. extending a finding

Move four**: Introducing present research by**

a. stating the purpose

b. describing briefly present research

Following this research model, a number of researchers have adapted the four-move pattern to their analyses in other subject areas (for example, legal, medical, economic…English documents). Swales' approach was also extended to other genres (laboratory reports, reprint requests etc.) as well as to other sections other than the research article introduction. Hopkins and Dudley Evans (1988) offer an eight-move scheme to model the discussion section of research articles (we report on this in section 3.3.4.3.). The genre analysis perspective has extended the English boundaries to encompass comparative research studies on genre across languages and cultures.

Although the ESP perspective on genre analysis has largely focussed on macro-level textual descriptions, several studies have also examined the linguistic aspects related to different genres. We note for example, the reporting verbs, the discourse functions, the passive constructions, and the use of tenses in research articles in various disciplinary fields. But unlike the previous textual studies, which were mainly concerned with the identification of statistically significant lexical and grammatical features (reported on in section 2.1.2.); genre analyses try to explain the rationale that lies behind these features. Research in the area was motivated by finding out the correlation that exists between form and function. It is assumed that the form of a text follows the communicative purpose it fulfils. Bathia (1994) argues that these textual features are of a great interest to the study of genre; they explain

why the texts are written the way they are. He even suggests that a lexico-grammatical analysis is an essential stage in analyzing genre.

Undeniably; both macro and micro descriptions of genre are essential elements in defining genre. But Swales (1990: 58) maintains that the construction of a genre is primarily influenced by the communicative purpose, as we can read in his definition below:

> A genre comprises a communicative class of events, the members of which share some set of communicative purposes. These purposes are recognized by the expert members of the parent discourse communities, and thereby constitute the rationale for the genre. This rationale shapes the schematic structure of the discourse and influences and constrains choice of content and style.

From this definition it follows that if the communicative purpose changes, the structure of the discourse is likely to change, resulting in a different genre. Swales' assumption finds support in his comparative analysis of the research article abstract and introductory section. *Prima facie*, the abstract and the introduction of the research paper appear to be very similar. Both occur in a research context, address the same readership, and use the same written mode. But the two seemingly similar genres are different in their communicative purposes. While the abstract is a factual summary of a longer report, which is meant to give an exact and concise account of the full article; the introduction introduces other forms of lengthy discourse. It is intended to give a persuasive description of the proposed research. Given their different communicative purposes, the two genres exhibit different structuring patterns and constitute two distinct genres.

Applied genre studies have flourished throughout the past decades. Discourse norms, at least for the Research Article genre, are revealed through a wide range of investigations falling between the text oriented and context oriented approaches. It is

now time to extend our understanding beyond the disciplinary genre knowledge and discuss the research article genre in the writing of academic professionals as it appeared in the social constructionist accounts.

3.3. The Social Constructionist View of Science Writing

The social constructionist view is the ultimate area of research on specialized writing. It is mainly concerned with investigating how science writing is performed in research settings. Unlike the textual and the cognitive approaches seen earlier, this perspective offers better insights for the social study of scientific texts.

- It demystifies the pretended objective reporting of scientific facts by uncovering the hidden face of the determining agents that lie behind the production of any piece of science writing.
- It legitimizes the importance of the study of writing within its social context. Because the scientific community is the matrix of scientific texts, it allows the study 'in vivo' of the whole writing process.
- It brings together the views of both linguists and sociologists which have long been separated. Linguists began to look for the social and disciplinary factors that influence writing, and sociologists started to consider the language through which scientific research is formulated.

The central issue raised by the social constructionist view is the nature of scientific writing. Should scientific writing be regarded as an objective, rational, neutral reporting of the experimental process, as it exactly occurs in the scientific laboratory; or are there any other influencing factors that determine the production of science texts? This question finds answer in Kuhn's *structure of scientific revolutions*, from which this perspective takes roots.

3.3.1. The Social Context of Science: The Scientific Community

The conventional way of defining science as it appeared in Andersen's words (1985:154) is:

> … It is the present day sum of articulated knowledge, independent of any actual scientists. To outsiders at least, it is seen as relatively objective, coherent and true, because it is what it means for knowledge to be scientific.

This common view of looking at science suggests that there is a dialectical relationship between scientific facts and the practice of science. Science is said to be objective, precise, systematic, and accurately reflecting the laws of the universe; scientists are regarded as "only messengers relaying the truth from nature" (Gilbert, 1976:285). In other words, truth is determined by nature, scientific facts speak for themselves and scientists are allowed no intervention upon them.

In his decisive work, Kuhn (1970) offers another view to the problem. He speaks of science as the work of "communities of scientists" and the sociology of such scientific communities as the key to an understanding of science itself. He speaks of the making of science as a highly social process, whereby individual scientists' work is dependent on the community's body of beliefs, values and theories. His assumption is that scientists function with predetermined beliefs that guide their research and argues that scientists, doing research in a particular area, form a self-contained system whereby research questions are determined and investigated according to a certain pre-conceived conceptual, theoretical and methodological pattern. This pattern emerges from a particular research tradition, and is inspired and carried out under the patronage of a leading scientist. According to this view, the scientists' role is not to generate new theories, test and refute existing ones; but the aim is to perpetuate particular research traditions, which Kuhn

referred to as the “community paradigms”. The argument, then, is that science is determined by “paradigms” around which communities are organised. He defined paradigms as:

> ...universally recognised scientific achievements that for a time provide model problems and solutions to a community of practitioners. (Kuhn, 1970 p.x)
>
> They are the source of the methods, problem- field and standards of solution accepted by a mature scientific community at a given time (Kuhn, ibid, p.102)

Thus, paradigms, from this point of view, act as a frame of reference for scientists. They guide research. They define criteria for evaluation. They ban membership. And they sensitise insiders and exclude outsiders. Neophytes learn them, acquire them through enculturation processes. In sum, paradigms are what scientists need to know to become members of a particular school, the ‘invisible college’, or the group of scientists working within the research tradition. The invisible college, not only develops its own research program, its research style but it also develops its own life style, which tightens the social bonds within the group.

One of the conclusions this description of the social context in which the production of scientific knowledge takes place, leads to is that science making as is insulated from social influence, from the community in which it arises. Both what scientists consider being research problems and the ways they deal with to solve these problems are determined by their own research program set out by the invisible college rather than by the principles that govern the physical universe. Thus, if science making is the product of social influence, as demonstrated by the Kuhnian theory, could we still hold the argument that science writing is a purely rational, impersonal and objective reporting which accurately reflects experimental processes occurring in the laboratory?

3.3.2. The Social Construction of Science Writing

Sociologists of science challenge the notion of scientific writing as objective reporting. They refute the belief that science writing stands quite apart from the scientists' beliefs and values. In their respective studies, (Bazerman, 1988; Myers, 1990; and Swales, 1990) make the case for the social construction of scientific writing. Their studies show that science reporting, just like research doing, is determined by the researcher's commitment to be consistent with the accepted paradigm.

Bazerman's studies show that a great part of the scientist's reporting job consists of persuading the research community that he has been consistent with the established assumptions. This rhetorical exercise consists of demonstrating that the standardised and widely endorsed procedures have been employed, that appropriate material has been used, and that the relevant theory, or paradigm has been applied. In other words, science writing is, to a great extent, dependent on the scientist's degree of commitment to the research paradigm. Such a commitment could be seen at various levels: conceptual, theoretical, instrumental and methodological.

Moreover, to gain acceptance of their research, scientists are constrained to tie up their present research to previous work and fit their claims within the defined research perspective. They draw on accumulated knowledge by citing the relevant literature. In doing so, the scientist engages in some form of 'knitting processes' that relates his research to other scientists' in the network

For the social constructionist view, such a commitment deprives scientific writing from its objective nature. The so-called "objective reporting" turns to be the making of communities; or as Grabe and Kaplan put it (1996:163) "objective

reporting is only what the dominant group says it is". If objective science reporting does not exist, can we speak of objective evaluation?

Bazerman (1983:160-1) answers the question by arguing that the acceptance of claims made in scientific papers is dependent on factors other than the proof offered in the paper itself. Below, he defines the system of values against which scientific claims are assessed.

> "... the writer must know the problems of the field, the ideals and the ethos of the field, the accepted justificatory arguments, the institutional structure in which the knowledge is to be communicated , and the criteria of adequacy by which the work will be judged"

Objective science making as commonly held is a questioned belief. Research doing, writing and evaluation are constrained by a range of social decisions, imposed by the community of scientists. These not only influence the process, shape the written knowledge, but they also determine the fate of scientific claims. If a scientist shows ignorance of the accepted views he runs the risk of being not published at all. A paper that does not conform to the referees' expectations is likely to be rejected. We can see the consequences for the 'deviant researcher' depicted by Gilbert (1976:298) below:

> There is a continuing pressure on a researcher to use a model which is compatible with those used by other network members. The penalty for not doing so is that it is likely that others will find it uninteresting, useless, or wrong. Consequently, it is probable that the 'deviant' researcher will receive neither substantial recognition from fellow network members nor many resources to help him continue his work.

Myers (1985a, 1985b, 1990), on the other hand, looked at the processes of evaluation and revision from the social constructionist perspective. His argument is that the writing and publishing of scientific texts could be regarded as "a negotiation of knowledge claims".

3.3.3. Scientific Texts as a Negotiation of Knowledge Claims

Through the lens of the "discoursal" school in the sociology of science, Myers was particularly interested in the referees' rejection of research papers. His study has been able to show that the review and revision procedure is "a process of negotiation of the value the community will assign to the text's knowledge claim" (Myers, 1985b:146). He argues that the complicated practice of the referee system aims at "positioning the level of claim within the community structure" (Myers, 1985a: 593). For Myers, the negotiation doesn't directly address the claim, but it focuses on the linguistic and stylistic features of the text, showing once again the social constructive and value-laden nature of science writing.

> I argue that the writing process is social from the beginning and that there is a tension inherent in the publication of any scientific article that makes negotiation between the writer and the potential audience essential (Myers; ibid: 596)

In his research, Myers followed two expert, well established biology scientists trying to win acceptance of their controversial work by the most prestigious journals in the field. One of them questioned an existing paradigm. The other, entered a related field of study. To get published, these two scientists met unusual resistance from their peers who required repeated alterations. The two professors had to deal with the arduous work of language revision many times, of course, not to improve any language inadequacy, but to negotiate and modify the level of their claims. Such subtle linguistic changes which were continuously introduced by the referees' on the scientists drafts were finally meant to downgrade the researchers' level of claim.

Myers' research included a detailed linguistic analysis of the scientist's drafts and the referees' suggested revisions. The referees commented on both form and style of the manuscript and many variables were affected to suit their claims. There

had been disagreements about length, about structure…, but the authors finally managed to get their papers into print but in a form different from what the authors intended: their theory downplayed and their challenges hushed.

One of the important conclusions Myers arrived at is that "scientific knowledge is created in a process of negotiation that focuses on texts not on facts" (1985b.147). His conclusions show the importance of sociological interpretation to the understanding of science writing. He notes that the social constructionist perspective makes possible a top-down analysis. An analysis, that begins first by understanding the social forces which lie behind the writing act.

Based on the same assumption, Swales (1990) has examined the rhetorical patterning of the research articles introduction. Using linguistic data, he has shown the social grounding of the research article genre.

3.3.4. The Social Construction of the Research Article Genre

The textual studies have revealed certain features that characterize the research article. Register analyses have documented us on the average sentence length, frequency of occurrence of tenses, prevailing word categories and sentence structures etc. These are reported to have evolved throughout time to give the research article the present shape.

However, the rhetorical features have, on the whole, remained unchanged. The research paper has still the standard rhetorical format, the IMRAD (the Introduction, the Methods, the Results and Discussion) scheme: The most significant advances in the study of the research article rhetorical structure are certainly the shift of focus from the traditional textual pattern to a socially grounded one. Genre Analysis, as initiated by Swales (and reported on in section 3.2.2.), have informed us that each of

these sections constitutes a communicative event that has a particular communicative purpose. Each represents a genre of its own and requires a conventional rhetorical format. In turn we discuss what these conventions are and how the rhetorical organisation is socially embedded in the practices of the scientific community.

3.3.4.1. The Introduction Section

The introductory section of the research article in science writing is reported to be the most important rhetorical section and one of the most troublesome parts to write. Besides the natural inhibition of getting started, there are other reasons that make it both significant and difficult. An introduction provides a sound background for the research. First, it tries to persuade expert members of the research community why a particular topic is worth investigating. Second, it shows a researcher's good grasp of knowledge in his field. An introduction always states a problem so that research findings could be appreciated. But the significance for the research writer is often more than that. It is what allows him to position his research findings within the research field itself, what enables him to locate his work in terms of interest as compared to other studies, and finally what makes him persuade the targeted discourse community of the trustworthiness of his work.

Swales' model (1990), The CARS model is a schematic discourse structure of the research article introduction, intended to develop awareness of the rhetorical conventions that govern the introduction genre. In fact, it is an analytical framework consisting of *Moves* and *Steps*, which fulfil different communicative purposes (figure 11 p.122). This modified version of his initial 1981 model consists of three essential *moves* (rather than four). The *moves* in turn, are divided into steps which are either obligatory or optional writing rhetorical stages.

Move One: **Establishing a territory** by

a. claiming centrality,

b. making a topic generalization, and

c. reviewing items of previous research

Move Two: **Establishing a niche** by

a. counter claiming;

b. indicating a gap,

c. question raising, or

d. continuing a tradition

Move Three: **Occupying the niche** by

a. outlining purposes,

b. announcing present research;

c. announcing principal findings,

d. indicating RA structure

The communicative purpose of the first move is to show shared background knowledge of the research area. Whereas centrality of claims states that the topic is worth investigating; reviewing items of previous research marks an attitude towards others' research findings. Although there is no consistent way of citing previous work, the issue of referencing impacts on the author's linguistic and syntactic decisions. For instance, the use of tenses determines the writer's position as regards the cited work and reporting verbs indicate either commitment to previous findings; or suggest some form of distancing. Similarly, tense usage may imply various intentions.

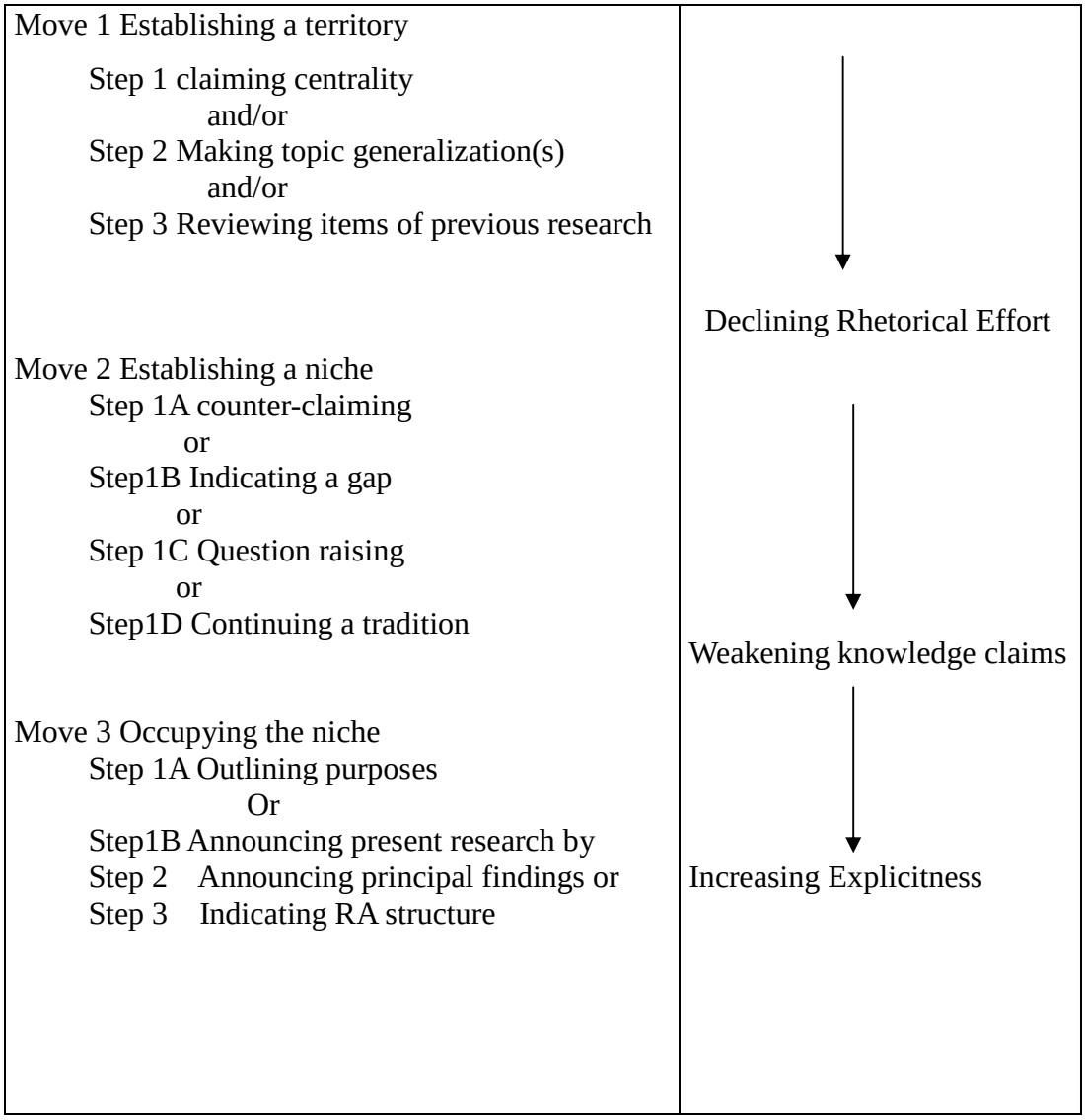
Establishing a niche offers the author an opportunity for creating a research space. The article writer either indicates a gap in the research area, or expresses an

opinion that somehow shows some limitations, or disagreement with previous work. At the lexical level, such “gaps” are signalled by items to which authors assign a negative value. At the rhetorical level, this move does not show seated regularity. It is even suggested that this move is made more apparent in highly competitive research environments, implying that non challenging science would exhibit less complicated rhetorical structuring; likely to be typical of NNS discourse communities.

After indicating the gap, the research article writer turns the research limitation into a “research space” that justifies the present article. The research space indicates the purpose, or describes what is believed to be the main features of the research. In both cases, this is a commitment which the researcher promises to fulfil. Although, this step is usually the ending statement of many article introductions, two further options are also made available to the researcher. He may either offer a summary announcement, or outlines the research article structure.

The CARS model is an interesting contribution intended for Non-native speakers of English as they make their way into the English dominated research world. The model offers guidelines for research writing, where it is assumed that there is a strong competition among individual researchers and research groups “to occupy a research space within the research community”. It supposes that “the greater the competition in a territory, the greater effort authors will have to expend in order to create research spaces for themselves” (Swales, 1992:11).

Figure 11: A CARS Model for Article Introductions



Source Swales: Genre Analysis (1990 p.141)

3.3.4.2. Materials and Methods Section

The purpose of this section is to present all the necessary information so that the work could be replicated. The research article writer is expected to supply information concerning all factors that might have influenced the experiment as well as the final outcome. This section should primarily include the experimental design, the equipment, the materials, and the methods.

Materials and methods sections are not intended for non-specialist readers. Rather, they are meant for a restricted readership. They are written for those who share the code and certainly those who are likely to replicate the research. Methods and procedures are described by a mere labelling of names and symbols, devoid of any clarification or explanation for the non initiated readership.

Some of the textual features that typify this section are: the complexity of syntax, excessive nominalization, lack of cohesive ties. Elliptical reporting makes the method sections read as “checklists” notes Swales (1990:169). Huckin, as reported by Swales (ibid) notes that the “Method section is becoming increasingly de-emphasized”. These are downgraded by being physically relocated towards the end of the paper and printed in smaller font than that used in other sections. But for journal editors, this is exactly an indication of how essential a complete Materials and Methods section is. Some journals have typeset this section in a smaller font so that space could be saved for more detail to be fitted in.

This section is reported to be the least appealing sections for linguistic and rhetorical study because of its repulsive style: "enigmatic", “swift”, “presumptive of background knowledge” (Swales 1990:170).This could certainly explain why this section has attracted little interest for research, as compared to other rhetorical sections.

3.3.4.3. Results, Discussion and Conclusion section

The Results and Discussion section are as essential as introductions, but these have not received the due attention from discourse analysts. These are important, because this is where the researcher's contribution to the field is presented and the validity of his results appears. According to Swales (1990: 170) research in the area "is

regrettably largely restricted to an exploratory, rather than hypothesis testing stage". Various reasons could explain this scant interest.

Unlike introductions, the discussion section does not show a regular rhetorical pattern. There is no consistency in how these sections should be arranged. While some research articles have three distinct sections: Results, Discussion and Conclusion; some others have only two (Results and Discussion), dropping out the conclusion. Furthermore, many have only one division, a fused result /discussion section.

Moreover, the conventions that govern the writing of this/these section(s) seem to vary from one journal to another. But this issue seems to be related more to the journal organisational matters than to an inconsistency in the rhetorical genre. When the Results section is separate from the Discussion, this is preferred for the sake of clarity; but this happens only in case of experiments with many treatments, but when the two are combined, this is reported to be effective in simple experiments.

Furthermore, the length of the Results section varies considerably from one article to another. Even within the same journal, this there is no consistency in length, and there seems to be no clear cut line between the sections. Very often, results are restated in the discussion.

As far as the rhetorical organization is concerned, the ways in which results are presented differ from one article to the next. These may take a parallel organisational structure, a balanced distribution of lexical and grammatical items, in which case the author is denied its very persona. In other articles, the discussion style is very much evaluative, and observational.

This inconsistency in the Results, Discussion and Conclusion section makes the rhetorical study somehow unreliable. Even though, there had been some attempts,

they certainly call for further investigations. Two provisional frameworks were reported to fill in this research gap: Belanger (1982 in Swales p.171) and Hopkins and Dudley Evans (1988). Belanger's hypothesis is that the structure and length of the discussion section is closely related to both the number and the kind of research questions posed in the introduction section of the paper. Hopkins and Dudley Evans (1988) offer a 'Move pattern', following the line of research developed in the CARS framework (discussed earlier). The structure as proposed by its authors consists of a ten-Move scheme involving the following:

Move one: **Background information**

This move aims at strengthening the discussion by some theoretical stances or reminding some technical information.

Move two**: Statement of results**

This is an obligatory move in the section. Very often, it was found to open the section.

Move three: (**Un) expected outcome**

The authors make comments on whether such a result was or was not expected.

Move four. **Reference to previous research**

The authors compare present results to previous findings.

Move five: **Explanation of unsatisfactory Result**

The authors provide reasons for a different result if found different from those in previous work.

Move six: **Exemplification**

An example is given to support a statement.

Move seven: **Deduction**

This refers to a claim intended by the authors to generalize particular results

Move eight: **Hypothesis**

A more general claim arising from the experimental results

Move nine: **Reference to previous research**

This consists of quoting previous work to support the present hypothesis

Move ten. **Recommendation**

Here, the authors make suggestions for future research

Research on the discussion section remains a complex issue. The models offered remain provisional and call for further investigation. The rhetorical complexity of this section explains the reason why there had not been many attempts to model it theoretically as researchers did for the introductory section.

Conclusion

Unlike the textual and the psycholinguistic approaches we reported on in the second chapter; the approaches discussed in the third chapter, represent two related lines of research that study the writing process from a shared perspective: writing as a social act , or writing as a product of communities. This view regards the process as a social activity, a social construct shared among members of a discourse community. Readers and writers are members of a social group, and texts are social tools through which interaction is achieved. Whereas the discourse community research approach has mainly been concerned with creating awareness of the conventions that govern disciplinary genres (in particular, the research article) and how these are acquired through enculturation and socialization processes; the social constructionist approach, with most research coming from the sociology of science and most studies devoted to the scientific community, offered a new interpretation to our understanding of the reasons that lie behind such conventions. According to this

approach, the writing of science is grounded in the scientific community practices and ethical beliefs. Relevant studies in the area have been reported, and the different ways through which the socialization processes are achieved have been described. The studies have revealed how writing in these contexts is produced according to the expectations of the discourse communities and how the conventions are learnt by the users.

Research issues raised by these studies are many. In the present study, we try to address some of them. We basically try to describe how NNS writers acquire membership in a research community, whose expectations are the most demanding. We seek to explain how writers come to acquire the rules of scientific discourse (conventions that govern the writing of their research papers). How they develop interactions with other members of the community and how they make use of the resources available to them to achieve their writing task. Guided by the above insights, we try to provide an account on the socialization process of NNS in the international research community with all the requirements it entails.

CHAPTER FOUR:

Research Design and Methodology

Introduction

The purpose of this chapter is to describe the general research design and methodology we have used for this study. After discussing the possible research models and explaining the rationale for choosing a qualitative approach, we describe the other research components: the setting, the participants and the methods. The method section discusses our three major sources of information. It also describes the procedures we have followed to collect and analyse our data. The advantages of interviewing, as the major research tool in this study, are discussed taking example from previous research. Additionally, we discuss the use of questionnaires and the case study approach, our main support to achieve reliability and validity issues.

4.1. Research Approach

The global aim of this research, as we stated earlier, is to gain an in-depth understanding of how scientists become members of the international research community through publication. Our specific purpose then is to study the Algerian scientists' socialization process into the world research community. In other words, we seek to describe the mechanisms that helped them acquire membership. This study will therefore provide a descriptive and interpretive account of the resources that helped them write their papers. It will be concerned with the description of the different factors involved in the different stages of the writing/publishing processes. To achieve this, two research paradigms are possible: We either call for a 'quantitative' approach, an empirical mode of enquiry; or chose a 'qualitative'

paradigm, also known as ethnographic or descriptive model. The former approach has gained a large acceptance and achieved conspicuous success. The latter has also begun to gain wider popularity in educational settings. There have been repeated calls for the need of qualitative investigations that inform on the complex relationship between writing and the social context. Such studies would enhance our understanding of the nature of the writing process, and the characteristics that distinguish it from other types of writing.

If we now turn to a hypothetical situation, what would our study have been like in case an empirical approach were used? We might have examined protocols of the scientists' writing. While composing, the scientists would have been asked to verbalize aloud their mental processes. We might have described the processes that are effective and those that are not. We might have examined the writing goals and how writers make certain choices. In a word, we would have studied the writers' cognitive processes while composing. A procedure, that is believed to yield rich data, but almost impossible to realize in professional and research settings.

The alternative approach is a qualitative model. A model, that aims at describing the writing process in its natural setting, and as it routinely occurs, without any intrusion from the researcher. The description takes into account the context where the scientists undertake research and work and aims at gaining a thorough understanding of the writer's behaviour and the reasons that lie behind this behaviour.

Studying writing from a qualitative perspective implies going beyond the cognitive process to describe the 'social relations' and 'the social roles' that tie writers to other members of the scientific community. For example, describing the process of co-authorship in article writing implies understanding 'who does what?',

whether the ordering of names carries any meaning, and whether this ordering is revealing of any roles in the scientific practice. Moreover, understanding why the process of reviewing and revision takes so long is likely to be enlightening on the "negotiation" process that ties writers to readers. It might also be telling on the "tensions" that the process entails between referees and research writers (Myers, 1990). Qualitative research offers such advantages that move researchers beyond the study of the cognitive stages of the writing process; but drag them on social grounds. Guba and Lincoln (1982:235) make the case for it.

> It offers a contextual relevance and richness unmatched by any other paradigm. It displays sensitivity to process virtually excluded in paradigms stressing control and experimentation. It is driven by theory grounded in the data; the naturalist doesn't search for the data that fit within his or her theory but develops a theory to explain the data. Naturalistic approaches take full advantage of the inconsiderable power of the human as instrument providing more than adequate trade-off for the presumably more 'objective' approach that characterizes rationalistic enquiry.

As shown in the quote above, and unlike experimental inquiries, qualitative research exhibits features that cannot be found in other research types. First, the process under investigation is studied as a whole; writing, for example in this study, considers both the hidden and apparent aspects of the process, the obvious and the less obvious behaviour... Put simply, the aim in taking such an approach is to gather as much information as we could on how the *scientific community* functions, how it is organized, how the relationship is structured among its members etc.

Second, qualitative research allows the researcher "little manipulation over the research context" (Seliger & Shohamy 1989:32). The qualitative researcher neither has recourse to experiments nor does he have any preconceived hypotheses from which the data is derived; rather the process is described relying on accounts and

records from different people engaged in the process (from the respondents' perspective). As the research process goes on the hypotheses emerge. In this study, the hypotheses stated in section (0.4.2.) are data driven.

4.2. Research Setting

The study took place in the department of biology, one of the most important departments that make up the University of Constantine in Algeria. The department was established in 1972, offering specialisation in three disciplines: Genetics, Food Industries and Natural Sciences. In 1983, because of the important expansion of the faculty, specialised institutions as the INATAA (Institut de la Nutrition, de l'Alimentation et des Technologies Agro-Alimentaires) were created to cope with the increasing number of students and to cover the wide range of interests. However, the founding faculty's primary concern was to offer training and specialisation in biology sciences and their related disciplines (animal biology, plant biology, biochemistry and microbiology) both at the graduate and the post-graduate levels. Despite the restrictive enrolment procedures imposed by the faculty regulations, the number of biology students has drastically increased over these last years.

4.2.1. The Community Research Requirements

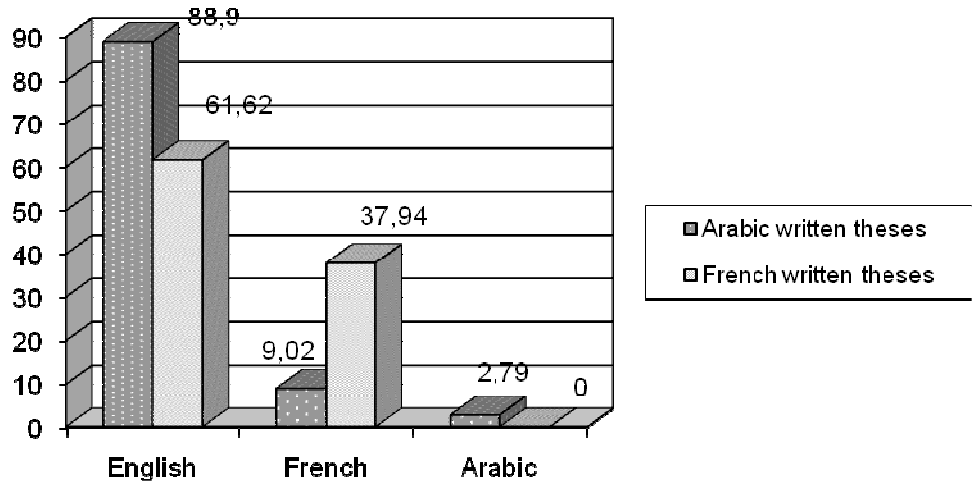
After a five year study, graduates hoping for more advanced university qualifications specialise in narrower fields of interests which prepare them for future research studies. Post-graduate studies in Algeria are likely to mean an 'initiation' into the research community. At this stage, scientists submit their first contribution, a *Magister thesis.* The intended audience for this work is a group of local assessors who evaluate the scientific validity of the finished outcome. This thesis has a twofold

aim: it assures career development and, depending on its quality standards, it may pave the way for a future publication project.

4.2.2. The Community languages of communication

The medium of instruction and communication in this faculty is both Arabic and French, but the required language for research purposes is obviously English. The theses must be written in either of the two languages, but almost all the literature cited is in English. The results of a preliminary study[7] we have undertaken to examine the trends of citation input in theses shows that English is the prevailing language of citation in both Arabic and French written theses. It represents respectively 88.9% and 62.61% of the total input. French, which ranks second, hardly cover the community linguistic needs (9.02% and 37.94). As to Arabic, this is almost totally absent (2.79% and O %) (Figure 12)

Figure 12: Distribution of Languages of Citations in Magister Theses



In fact, this important role that English is expected to have in the community is echoed in most official documents. As regards the graduate level, it is stated that

[7] D Slougui: ESP: Where does the real problem lie? Conference paper, presented in the Maghreb ESP Conference. Sfax-TUNISIA (May 1995)

prominence should be given to reading comprehension:

> Au cours de leur scolarité, les étudiants reçoivent une formation en langue étrangère telle qu'à l'issue de leurs études, ils soient en mesure de comprendre et d'assimiler, dans cette langue, les acquisitions nouvelles des sciences , objet de leur spécialisation. [8]

The requirements at the post graduate level are more important and aim at enabling students to use English in their research writing:

> L'enseignement de la langue étrangère, dispensé au cours des quatre semestres d'études, vise a la maîtrise de cette langue par l'étudiant en vue de son utilisation technique dans le domaine de recherche choisi…la soutenance des travaux de recherche est conditionnée par le succès a tous les modules de langue étrangères[9]

However, neither the allocated time (60 hours a year) is sufficient, nor the teaching methodology is appropriate to enable the potential researchers in the biology department to achieve the above stated objectives.

4.3. Research Participants

The participants who took part in this study were selected on a single-based criterion: they must have got published at least once in an English written international journal. To avoid discrepancies, all of them are biologists specializing in different areas of their field of study. A single purpose questionnaire was administered at the beginning of the study to identify the potential participants. Fourteen respondents replied positively: Three did not show any more interest. Two were not selected for the following reasons: one is not representative of our sample; he graduated in Britain and published his results while there. The second published in a Middle East journal. We assumed that criteria emanating from Middle East editorial boards might be

[8] Arrêté du 25 août 1971 portant mesures d'intégration d'un enseignement en langues étrangère. Art.2

[9] Décret n° 76/43 du 20 février 1976 portant création de la post graduation)

different from those of northern countries as far as language exigencies are concerned. This situation has reduced our participants to the number of nine. Seven are already doctorate holders, and two are doctoral research students in their writing up stages. Their academic qualifications range from full professors to assistant lecturers, as shown in table 11 below.

All participants use French as their language of professional communication. They all learnt English as part of their secondary education. In all cases none of them had practised the language ever since. Despite their 'low performance' in English (this is based on their self-evaluation which emerged from the many informal discussions we had with them), they all published in well rated journals through the English medium. Their publication frequency ranges from beginners, who are launching their first attempt, to experienced researchers, who have already five and more published work and a long list of conference proceedings and poster presentations. Table 11 summarizes the participants' profile, but for confidentiality reasons, the names have been replaced by letters.

Table 11: Linguistic and Academic Background of the Research Participants

Participants	Field of study	Academic qualifications	Performance in English	number of publications
A	Microbiology	1	1	8
B	Biochemistry	1	1	5
C	Plant biology	1	0	3
D	Biochemistry	2	0	6
E	photochemistry	2	1	3
F	Microbiology	2	1	3
G	Molecular biology	3	1	1
H	Nutrition physiology	3	1	3
I	Toxicology	2	1	7

Qualifications:	performance in English
1= full professor	0= poor
2= senior lecturer	1=average
3= lecturer	3=good

4.4. Research Methods

Data in this study include both verbal accounts, which scientists made on their writing processes; feedback from editors and reviewers; and written documents which are the drafts of their submitted manuscripts. These are gathered using a combination of data sources. Such a procedure is known as “triangulation” for which a justification is given below:

> A combination of data sources is likely to be necessary in most evaluations because no one source can describe adequately such a diversity of features as is found in educational settings and because of the need for corroboration of findings by using data from different sources. (Weir and Roberts 1994:137)

Although our data were gathered by different methods, our main procedure is interviewing. Questionnaires and case studies helped us gain better insights and validate interview findings. In turn, we discuss each of the procedures, but our starting point is to develop an argument why interviewing has been selected as a major procedure.

4.4.1. Interviews

Interviews have long been used by ethnographers to study cultural phenomena, but over the past years, they have become one of the major tools writing researchers use to study writing processes. This concern arouse out of the interest to study writing in natural settings and to understand the process by which particular people write in

some contexts. Nowadays, more and more research uses interviewing as a qualitative method. The method proved useful for many reasons:

- It allows the researcher to probe a topic at greater length and depth. (Doheny-Farina & Odell (1985:522). The researcher not only gets the information he requires; but he also stimulates and encourages the interviewee to elaborate on a topic.
- It allows a high response rate.
- It allows a direct access to what is "inside a person's head" (Tuckman in Nunan 1992:309)

4.4.1.1. Purpose of Interviewing in the Study

Besides the above mentioned advantages, interviewing was chosen in this study, because it is the only method that probes for information after the task has been completed or the event has taken place. As Nunan (1992:149) put it, it is the only appropriate method for "retrospective data gathering". Respondents in this study were asked to look back at their experiences as writers. Apart from two participants who reported on an 'on going' process and a 'just completed' one, all participants reported on previous experience. We are aware that such a situation might affect the reliability of our data, but our sampling would have been drastically reduced if we had to select only those scientists who had recently published.

4.4.1.2. Type of Interview, Interview Schedule, Question Format, and Response Mode

Questions follow an interview schedule which has been prepared in advance (appendix B). The schedule was developed after several informal discussions with

the scientists and the reading of papers related to the area. It consists of predetermined questions, but some have arisen during the interview allowing either clarification or elaboration on the respondent's answers. Two types of schedule items were used: fixed and open-ended questions. Fixed alternative items aimed at gathering factual information as *Was your paper read at any conference*? Open ended questions sought for opinion and attitudes, for example, *What do you think of the language teacher's revision of manuscripts*? .It is important to note that the interview schedule could not be strictly followed, and the ordering of questions was often altered. In answering one question, respondents often anticipate on other questions. Sometimes, new questions emerge, while others are necessarily deleted.

4.4.1.3. Summary of Interview Questions

The questions are organized in an orderly sequence, beginning with the pre-writing stages of the process and ending with the feedback and revision processes, bearing in mind that all these variables revolve around the language issue. The questions are concerned with the following variables:

- Motivation for publishing
- Criteria for journal selection
- Generating the idea for publishing
- Drafting and revising the manuscript
- Submitting the manuscript
- Co-authorship
- Reviewing the manuscript
- Evaluating the manuscript
- Publishing problems and personal suggestions

For the last questions, respondents were asked to provide their own views on 'getting published' problems and how things could be improved. The responses were transcribed (appendix C) and scientists provided drafts with annotated suggestions to support their responses.

4.4.1.4. Conditions for Interviewing

According to Chin (1994:254) "little attention is given to describing the conditions of interviewing". These details are hardly described despite the fact that they tell us much about the interview itself. In this section we shall provide descriptions of the setting, the time spent as well as how responses were recorded.

– **The setting**: The interviews took place in a variety of settings. These were mainly determined by the participants' choice. Scientists, most of the time, welcomed the researcher in their working places, either the research laboratories or their offices.

- Six interviews took place in the research laboratories. These places, however, presented a major disadvantage for the recording quality. As they were not private working places, technicians, staff members etc. could have free access to. This made the place noisy for the quality of recording and disturbing for both the interviewer and interviewee.

- One interview took place in the researcher's office. Besides the fact that it was a comfortable place, it presented major advantages. The information could be exchanged in private; the interviewee had easy access to the work documents. Whenever questions that required some evidence were raised, (e.g. the reviewer's comments), the interviewee hurried up to provide the appropriate file.

- One meeting took place in the interviewee's home. This also presented the same advantages as the ones described above, with an additional one that we had no time constraints.
- The last type of locale is the researcher's home. The meeting was less formal and therefore allowed to establish some kind of trust, a feeling of cooperation. This obviously tended to be longer and with elaboration on the topic.

– **Type of Recording and Interviewing Time:** Interviews were audio taped and varied in length. Though we planned them for three quarters of an hour, they often took longer varying from 60 to 90 minutes.

4.4.1.5. Data Analysis Procedure

One of the most disturbing features of qualitative research is that there is no available literature, describing the principles on how to analyse data. Moreover, very few studies provide full or sufficient accounts on their research processes which could serve as sources of inspiration or as guiding models. Nevertheless, after gathering all the data, we followed the steps described by Seliger and Shohamy (1989:204-205) which consist of:

– Data transcription: The interviews were tape recorded and transcribed indicating exactly word to word what was said. Transcripts were marked with name, date and place (Appendix C).

– Organizing scheme: After reading and re-reading the transcripts, Segments of texts that answer our research questions were delineated, and sets of categories were derived from these segments. Common and different patterns, emerging from the data, were grouped into an organizing scheme (see section 4.4.1.6)

– Data summarizing: The data were summarized and selected quotes were highlighted where appropriate in the data analysis (chapter five).

4.4.1.6. Interview Data Categories and Organizing Scheme

The regular patterns that emerged from our interview data are summarized and responses are sorted into in the following organizing Scheme. Very often a scientists' answer provides more than one option to the question.

	Questions	**Categories** *Responses to the question were sorted into*
1	Why is it important to publish research results?	– Establish value of one's research work – Retain one's position in the research community – Necessary for career development – Fulfil roles properly – Expand scientific knowledge in one's field of investigation. – measure proficiency
2	How is the idea of getting published generated?	– Having some worthwhile results – Achieving original and interesting findings
3	Prior to publication is the research idea discussed with any of your colleagues?	Yes: discussion is held within – research team meetings – International conferences
4	On what grounds do you usually select your journal for publication?	– Scope of research results – specific field – Speed of publication – Journal index factor

5	Have you ever tried to submit a paper to one of the most highly ranked journals?	No. These require: – Being under the aegis of a well known scientist – Being a member of scientific societies – -working in a more supportive research environment Yes. But resulted in – Getting rejected.
6	How do you usually do to write your articles in English?	– Draft the paper in English and had someone correct it. – Write in French and had someone translate it.
7	How did you acquire the writing skill?	-Extensive reading experience - Exposure to similar articles
8	What are the difficulties that you meet when writing in English?	– Time consuming – Having someone revise according to the journal conventions – Uncertainties as to whether one's English conveyed the intended meaning
9	What are the difficulties that you meet when writing in French?	– Having someone translate faithfully their ideas – High cost of translation services – Time consuming
10	Who do you usually get help from as far as language revision is concerned?	– A language teacher from the English department – An Anglophone colleague from the same discipline – A co-author

		– A language revision specialist
11	What do you think of the language Teachers' assistance? What about other language revisers?	– Language teachers is inadequate and unsatisfactory – Colleagues from the same discipline is inefficient – A co-author is reliable – A language revision specialist is very successful
12	It is often said that getting published in peer-reviewed journals is difficult. Do you take any precautionary measures to get your paper accepted? For example, – Do you use any potential referees in your references? – Do you present your paper in any international meeting,	Potential referees are never intentionally included within the reference list. But researchers – Trust the quality of their own work – Make sure to include a senior scientist within their co-authors lists – Present their work in some form of scientific meeting – Use the name of the foreign institution they are affiliated to
13	Why is the address of the foreign institution preferred?	– For prestigious reasons – For practical reasons – For reliability reasons
14	As far as co-authors are concerned, does the paper circulate among the different authors? Who does what?	– The genitor of the research idea (usually the main author) – The designer of the experiment (often the laboratory technician) – The one who analysed the data – The head of the research team

15	Why is the name of a senior scientist included in the co-authors list?	– Honorary title – Essential – Some role in the process – A passport to the publishing world
16	Do you think there is any part of subjectivity from the reviewers? a) because you are a non native speaker b)because you come from a 1/3 world country	Yes: because – Particular topics are the preserve of certain research teams – Quality of reporting is severely judged – local research environment is not trusted No: – Peer reviewing is anonymous
17	What are according to you the criteria for evaluating a manuscript?	– Value of research findings – Grasp of the research design – originality of work – Background and reputation of author/s – Relevance of article to journal focus – The name and the reputation of the laboratory they are affiliated to – The professional attributes of one of the authors on the list
18	Do you think an article could be rejected on linguistic grounds?	– No. This rarely happens – Yes sometimes
19	If an article is rejected. Do you abandon the idea of publication? What do you usually do?	– try to submit to another journal – Improve the paper and resubmit it

20	What aspects do referees usually comment on? What changes do they ask for?	– Fault in reasoning – Quality of reporting – Editors suggest the following changes: – Furthering investigations – Offering explanations – Providing evidence – Covering literature – Reconsidering the language used – Reconsidering tables and figures
21	How many times do you usually rewrite the paper?	Average 3 times (answers range from 2 to 7)
22	What could the Algeria's low productivity o publication be attributed to?	– The research environment – The quality standards – The language proficiency – The editorial constraints
23	How can the situation be improved?	– Set up specialized translation services in local institution – organize highly specialized courses – award research priority in governmental policy

4.4.1.7. Limitations of the Interview Sample

The research sample is certainly not characteristic of all Algerian scientists who write and get published in international journals, and it is certainly not at all typical of NNS science researchers. However, we can claim its representativeness as far as the community under study is concerned. Our sample represents largely the targeted population and could be regarded as a representative sample. Due to the limited

number of our respondents in this study, our observations should be regarded as case studies of particular science writers. However, common ideas did emerge, allowing us to speak of a general pattern.

4.4.2. Questionnaires

Our second research instrument is the questionnaire. It was addressed to journal editors, seeking to achieve the following purposes.

4.4.2.1. Purpose

The purpose of the questionnaire is twofold (A copy is included in appendix D):

- To corroborate the data, we gathered through interviews.
- To get the editors' perceptions as regards the publishing process of NNS

4.4.2.2. Approach and Design

The questionnaire was designed to gather both quantitative and qualitative data. It comprises eight questions, articulated through a variety of format. Both closed and open format questions. Editors were asked to

- rank a predetermined number of frequently stated criteria that influenced their decision to accept a manuscript.
- tick appropriate answers which best express their opinions
- provide opinions when possible

4.4.2.3. Method of Survey

The survey questionnaire was sent by e-mail with a covering letter, outlining the aims of the research. A week after, the same questionnaire with a follow-up letter, was addressed to non-respondents to prompt their reply.

4.4.2.4. The Journals Selection

The criteria for the journals selection were as follows:

- The international scientific journals chosen are all peer-reviewed journals, indexed in the **Journal Citation report** (JCR). Most of them have a high impact factor and arefrequently cited journals. They were selected from the online data base DOAJ (Directory of open access Journals)
- The publishing language is English
- The field of study is biology and related disciplines

4.4.2.5. Returns

70 questionnaires were sent to major English Scientific journal editors in chief in the field of biology and related disciplines (see appendix E). The response rate was very low. After a week a follow up letter (e-mail) was addressed to the non-respondents. The strategy proved successful, and we achieved a better return rate, averaging 53%, which accounts for 37 journals. Among these, 11 editors 16% courteously replied; but these were negative replies. Most of them were regretful that their journals did not have the NNS issue. They have had few non native English contributors so far. At worst, only a few manuscripts have needed any corrections. However, frustrating and disheartening replies just tell: “sorry - no time”, or forward a blank questionnaire wishing us all the best. We ended up with twenty eight (28) respondents.

4.4.2.6. Rationale

Questions seek to throw light on factors which influence acceptance and rejection of manuscripts. The suggested factors are adapted from previous work on the criteria for the evaluation of manuscripts (Lindsey1978: 19), from Swales 'work (1990), from Myers' work (1990), and from our interviews data. The questions were aimed at finding out answers to the following:

- Whether decision making is influenced by the quality of the written text.
- Whether decision making is influenced by the professional attributes of author(s): the name and the address.
- Whether language problems are a major cause of rejection.
- Whether rejected papers preclude authors from publication.
- Whether editors are geographically discriminating.
- Whether linguistic revision is aimed at positioning the claim within the scientific community structure.
- What language errors are encountered in NNS submitted manuscript.
- How the situation could be improved.

4.4.2.7. Pilot study

The very first set of questionnaires (5) we sent generated some additional comments and criticism on both format and content. This allowed us to reconsider the design immediately. The *Acta protozoologica journal* editor replied by drawing our attention to two aspects. In his own words, he commented:

> …I found it impossible to introduce the numbers into the boxes. This is why I put them close to the text. Sorry for that. Also, many points turned to be very difficult to fill

> unambiguously, For example, it seems impossible to rank the criteria used for accepting manuscripts. Most of them must be taken into account at the same time since they all count.

If the comments on the layout were easy to solve, the one on ranking the criteria was indeed difficult to answer. The question assumes that editors have a base of ordering assumptions that they apply to each paper being judged. In real life, editors are unlikely to have such a definite set of criteria. It is rather impossible to have such a grading in mind; the evaluation is a holistic process. The question is embarrassing indeed. Criteria emerge through an ongoing process.

4.4.2.8. Data analysis procedure

The data obtained from questionnaires were analyzed using both qualitative quantitative approaches. Answers for each question were tabulated, and the number of occurrences was counted, showing how frequent the various options were chosen. Selected extracts from open ended questions were quoted in the qualitative data analysis section (5.2.).

4.4.3. Case Studies

Quickly defined, a case study is "an instance in action" (Alderman *et al* in Nunan1992:75). It is an illustration from the class of objects, phenomena, or social units that a researcher is investigating, seeking to understand thoroughly the way this instance functions in a particular context. Cohen and Manion (1985:120) explain that the purpose of the case study approach is

> …to probe deeply and to analyze the intensity of the multifarious phenomena that constitute the life cycle of the unit with a view to establishing generalizations about the wider population to which the unit belongs.

The case study approach is therefore a research method whose purpose is to fully describe single units so that generalizations or cross comparisons could be made. In writing research, there have been many case studies. The approach has been widely employed to investigate the writing process/product of advanced and undergraduate; native and non native learners. The process consists of direct observations; audio taped protocols as well as retrospective accounts of composing. Rymer (1988), for example, reported on a scientist's writing process for international publication. The composing strategies and practices of the case study subject were compared to other scientists'.

Product oriented data, however, consist of analyzing the textual features of the various drafts of the subject's under study. Dudley-Evans, (1991) used his doctoral student's drafts, to examine the stylistic and linguistic expectations of the supervisor (the supervisor's comments are revealing of the discourse community expectations). Connor and Mayberry (1996) investigated the thesis drafts of a graduate student to examine how he acquired the rhetorical and linguistic conventions in disciplinary writing. Myers (1990) used a case study approach to investigate two research papers' drafts of two expert scientists. He analyzed the textual changes brought to revised papers. Such studies have helped legitimate textual analysis as a valid approach in qualitative writing research methodology.

4.4.3.1. Purpose of the Case studies

The purpose of using a case study methodology, in this research, is to undertake a detailed linguistic analysis of the two scientists' various drafts in order to determine the characteristics of the revised manuscripts and try to provide an interpretation to

such suggested revisions. Such a procedure is expected to be revealing of the editorial expectations and the linguistic conventions which typify scientific writing.

4.4.3.2. Subjects of the Case Study

The two participants, whose drafts have been analyzed, constitute two representative but contrasting case studies. They not only illustrate an instance of experienced /novice writers; but they also portray two opposing writing strategies. We note, however, that among the panel of scientists with whom we carried out our interviews, only these two scientists were able to provide drafts. Others were regretful that they rarely keep such documents once the article is published.

- **Case study 1: Participant I**

The main author is a doctorate holder, who is on a research program sponsored by the department of pharmacy and toxicology INRA/France (Institut National de Recherche Agronomique) . He has a considerable academic experience and a regular frequency of publication. So far he has published six English articles and co-authored many others.

The paper under investigation is entitled ***Toxicokinetics of Lead in the Lactating Ewe Variations: Induced by Cadmium and Zinc of Lead.*** The paper was published in ***Environmental Sciences***, 5/2 (1997), an international journal issued in Tokyo/Japan.

His article was first written in French then translated in English (see appendix F where various drafts are included). The paper was read and corrected by a secondary school English teacher; but prior to submission, it was revised by a proficient English science writer. Five co-authors took part in the process, each playing some role. The paper generated other articles, which were published in the same journal in later

issues. The editorial board rated it as “interesting”; and it was accepted with revision. Submitted in January 1996, it was accepted in June but was only printed in 1997. Before publication the paper has undergone a scrutinized editorial textual revision that we found worth investigating. These proofs constitute an important section of our textual analysis data.

– **Case study 2: Participant G**

The main author is a doctoral research student, affiliated to one of the most outstanding research labs INSERM- France (Institut National se la Santé et de la Recherche Médicale). Motivated by her original findings and encouraged by the research team she is involved in, the researcher launched her first attempt in the publication world.

Our second case study participant’s paper is entitled: ***A Novel C to A Transversion within the Distal CCAAAT Motif of the Gγ Globin Gene in the Algerian G γβ HPHF.*** The study investigates the blood gene in a large Algerian family presenting a high level of foetal haemoglobin. Submitted to one of the most prestigious journals in the field, ***HUMAN MUTATION;*** the manuscript received favourable comments on both the research significance and the clarity of style. However, because the article was found too long for the scope of the journal, it was rejected (see appendix G). Confident in the value of their findings, the authors submitted it to an equally prestigious journal, ***BLOOD***, where the paper was published in fall 1997.

In writing the paper, the Algerian author has written the paper straight in English, but the article has been extensively revised (7 times) and expertly checked for language appropriateness. We examined the latest drafts.

4.4.3.3. Data Sources

As we stated above, the data were obtained through authentic samples which include the scientists' initial drafts, revised manuscripts and published articles allowing a contrastive study on the changes which the papers have undergone from the first draft to the last version. The reasons for rejection, as annotated by reviewers and referees, were also examined.

4.4.3.4. Units of Analysis

The units of analysis in this study include all the comments and revisions which specialist revisers made on manuscripts. These range from linguistic matters to scientific ones. Despite the fact that these latter are overwhelming, we restrict our analysis to those features which affect the linguistic and discourse components.

4.4.3.5. Data Analysis Procedure

The units of analysis were classified and analyzed according to an adapted organizing scheme which we developed out of the existing literature: Ventola and Mauranen (1991). This includes two broad categories labelled: the lexical and grammatical category and the rhetorical category. The former includes the lexical choices, tense choices; prepositions, articles, spelling, noun phrases, connectives, and sentence structure. Once the units were identified, extracted and classified, the data were tabulated and the frequency of occurrence calculated. The latter analyzes the rhetorical structure of the two papers according to the norms defined by Swales (1990). Analysis of the data is provided in chapter six.

4.4.3.6. Limitations of the Method in the Study

Our interpretations to these revisions are provisional. Explanations on why particular discourse forms have been preferred to others, why particular linguistic items have been used instead of others need counter checking with specialist informants (i.e. experts in the field who are either authors of scientific papers, or specialist revisers). Although the investigated papers yielded interesting and rich data, they could be regarded as too limited to be generalized. The results remain exploratory and need further research.

4.5. Validity and Reliability

Validity and reliability could be regarded as quality gauges for assessing research credibility standards, but these represent the dark stage in qualitative studies. How can a researcher defend reliability and generality of his findings if the research tools are said to be prone to "subjectivity and bias" (Cohen and Manion 1980:308)?

Qualitative data are, by the very fact, not objective facts, and the data collection procedures are hardly reliable since they provide data from the perception of an individual. Unlike quantitative research tools, which allow replicability; qualitative methods are "second hand" descriptions which are obtained through informant's accounts (Weir and Roberts 1994:140).

Despite these restrictions, qualitative data collection procedures are currently in vogue. Besides observations and case studies, interviews are considered as one of the most popular survey methods in social and educational research.

To what extent are interviewing and case study approach reliable and valid field-work tools? To what extent are the data generated by interviews in writing research accurate? In this study, if we are not going to make the case for it; we are,

at least, going to show that our data were not carelessly gathered and our interpretation has not been biased.

4.5.1. Reliability

Reliability has been defined as an instrument "which provides information on whether the data collection procedure is accurate and consistent" (Seliger & Shohamy 1988:185). In other words, Reliability is concerned with the extent to which research results could be considered as trustworthy, and the research methods as dependable.

If we turn to interviews as a method in writing research, many of the debate revolve around the issue of reliability. Chin (1994:248) argues that "interview data are just as susceptible to being an inaccurate account of what people do and think about in writing, that is, if accuracy is the goal we strive to achieve". And Weir and Roberts (1994:143) note that bias may arise from different sources: the informant, the interviewer, and the question wording:

- In post event reconstruction, Informants tend to create an event that is favourable to them; or provide what they think is wanted from them.
- Interviewers may sometimes cue respondents, seeking for attitudes and opinions that support their belief.
- The question wording could also be a source of misunderstanding. If meanings are not assigned their appropriate words, the interviewee is likely to misinterpret the question and his response may yield unreliable responses.

If data are not supported by other data, interviews are likely to be unreliable. In our study, for example, participants were asked whether they thought that the language

variable was likely to affect the referees' evaluation. Though carefully worded, the question brought contradictory viewpoints (see data analysis section 5.1). Each participant's view reflected his or her own experience. In fact, the interviewee' responses were a real instance of what Chin (1994:253) referred to as "a true reflexion of people's thoughts and practices", and there was no way for answers to be stripped away from their personal element. The interviewees' responses showed a constant signposting to their own experiences. Because reliability might have been affected in this situation, we had to corroborate the interviewees' accounts with other data sources (the editor's comment on rejected drafts and editors' views in questionnaires responses). Such a combination of techniques from different sources allowed us to compare information and reduce sources of bias.

4.5.2. Validity

Validity in qualitative research answers the question: "how well matched is the logic of the method to the kinds of research questions you are asking and the kind of social explanation you are intending to develop" Mason (1996:147). Unlike quantitative research, qualitative research does not provide proofs for validity but relies on the strength of the argument.

In this study, the question: "What do Algerian Scientists do to write and get their papers published in English?" was fully answered, at least from our own point of view. We believe that the picture has been depicted from various angles: the writer, the reader, and the text. Each of these perspectives contributed to explain how Algerian scientists' papers were shaped, constructed and transformed into a journal contribution

How appropriate is the method for answering the research questions? Interviewing, in this study, is advantageous at two levels: At the theoretical level, writing is studied in its natural context, i.e., the scientific community. We relied on authentic material and the participants reported on real tasks they had performed as part of their work, not as part of an experiment. Thus, the writing process was studied from the *emic*"[10] perspective; from the members of the scientific community perspective who assigned meaning to their own experiences. Our participants described their own processes and strategies from their own perspective.

At the operational level, interviewing was beneficial because it allowed us to investigate the topic thoroughly. We not only got the information we required, but very often , interviewees were encouraged to elaborate on the question which gave us better insights for later stages in the research.

The issues of validity and reliability have been cared for throughout the study; nevertheless, we can not exclude the fact that there might be inaccuracies in our data, that there might be gaps we have been unable to fill in. This is merely due to the approach we have chosen and for which reliability and validity standards are very difficult to achieve.

Conclusion

In this chapter, we have attempted to provide a thorough account on our research process. Our study has reported on every detail related to our design and our methodology. We believe sufficient description has been given to allow for

[10] In qualitative and ethnographic research, each situation investigated by an ethnographer must be understood from the perspective of the participants in that situation. This characteristic is often expressed as the *emic-etic* principle of analysis. Karen Ann Watson-Gegeo (1988) Ethnography in ESL: defining the essentials. Tesol Quarterly, vol 22, N°4

evaluation of these methods as research tools in studying writing. Interviews constituted our basic method for data gathering. They allowed us to gain a holistic and an in-depth understanding of the process. Questionnaires, addressed to editors, helped enlighten darkened areas, cross check opinions but mainly compare with interview findings. Though restricted in scope, the two case studies enabled us to tackle the linguistic issue, and raise many questions inherent to the writing of scientific discourse. These, will hopefully, open the door to further investigations. The next chapters will be concerned with our data analysis. Our data will be analyzed from three different angles: the writers, the readers and the texts. In chapter five, we shall be concerned with the macro level; and in chapter six, we shall deal with the micro level.

CHAPTER FIVE

The Reader / Writer Interface

Introduction

In this chapter, our purpose is to try to find answer to our research questions 1 and 2. In other words, we seek to describe the reader/writer interface as regards the writing and publishing processes. The chapter includes a macro level analysis which we derived from the interview and questionnaire data. Each of these tools offers a different but complementary resource. Although the two perspectives are closely tied up together; for purpose of clarity, we talk about each in turn and make cross reference when necessary.

In section one, we discuss the individual strategies which Algerian scientists have developed in order to write and get their research papers printed in English. The discussion involves both the stages of the process and the difficulties they met when writing in a foreign language. Essentially, the scientists reported on how they have coped with the writing and dissemination constraints, and also made accounts on personal experience by reference to papers they had successfully published.

In section two, we report on how international journal editors respond to NNS' submissions. The analysis is basically about the language variable in the assessment of the scientists' manuscripts. It deals with the criteria that govern manuscript evaluation and tries to answer the question whether editorial rejection is purely on scientific grounds or whether editors are discriminating linguistically and geographically. The analysis considers other issues as the revision process and the language errors prevailing in submitted manuscripts. Thus, our discussion in this

chapter is organized into two broad categories which we have entitled: The writers' perspective and the readers' perspective.

5.1. The Writers' Perspective

What do Algerian scientists do when they write their research papers? How do they generate their topic, write, revise; and edit their papers before submitting them for publication? What strategies do they make use of, and what resources do they rely on to make their writing/publishing task successful? Developing various arguments, the scientists in this study have answered our various questions. Starting with the motives that usually generate the idea of publication, the scientists described the different stages involved in the writing process: the prewriting, the writing and the post writing stages. While describing the various stages, the scientists expressed their attitudes and feelings as regards a number of related issues. In this section, we analyze their accounts.

5.1.1. Generating the Idea for Publication

According to the scientists in this study, there are many reasons which motivate them to transform their research findings into a journal contribution. If original and interesting research findings in their scholarly areas are by and most the strongest motive for all scientists that generate the idea for publication, there are always other intrinsic reasons which drive them to getting published. These range from an inner, immediate need to a public and worldwide achievement. This graded motivation, in our opinion, depends largely on the scientist's perception of the scientific work and possibly, his present academic position in the research community. For participant C, for example, getting published is a partial requirement of a doctoral work:

> La thèse est obligatoirement sanctionnée par une publication pour la soutenir.

In fact, it is. But for participant A, publication is also a necessary condition for career development:

> La carrière à l'université avance à coups de publications, il est évident que c'est un déterminant important.

However, participant H believes that more than a necessity for career development, publishing is a researcher "raison d'être":

> L'efficacité d'un enseignant à l'université, d'un chercheur se mesure a sa publication C'est une unité de mesure…. Comment prouver que vous êtes dans le domaine scientifique, que vous activez scientifiquement si vous n'avez pas de publications ?

Seen from another perspective, publication for participant G is after all a "public reward" for the efforts a scientist has made.

> Quand on commence une recherche, le but c'est une publication. C'est une reconnaissance publique, internationale du travail que tu fais.

However, participant A argues that publishing should not be viewed from a mere individualistic perspective, it is essentially a contribution to the world's stock of knowledge; it makes science move forward.

> Quand on fait un travail de recherche dans un domaine donné, on est au courant de tout ce qui se fait dans ce domaine et de tout ce qui s'est fait… et quand on est conscient d'avoir apporté quelque chose de nouveau à ce domaine et bien la motivation est… c'est de contribuer à faire avancer les choses dans ce domaine là.

Whatever the motives for publication are, getting published is what all Algerian scientists look forward to achieving successfully. The drives for publication are numerous and different, but how can this be made possible? How to get started? Where to publish? Who takes part in the process? For the interviewees, once the idea of publishing is generated, a long period of preparation ensues during

which discussions at both informal and formal levels take place. The scientist has recourse to a number of strategies to make the process achievable. He may seek advice from his peers, as illustrated in participant H's words:

> Je leur (collègues) fait partager par exemple une lecture et je vois leur critiques.

Unlike the previous colleague, participant G doesn't share ideas with peers in Algeria. She is liable to a foreign program in which local help is not of great help. She rather relies on distant guidance:

> Je ne partage pas l'idée avec les collègues ici parce que je ne fais pas un travail en Algérie ; c.à.d je suis télécommandée ici. J'ai un programme de travail que je ramène de France parce que mon promoteur est là bas, J'ai une Codirectrice ici mais disons que mon travail je le fais en France, je sais ce qu'il faut faire une fois que je suis ici;… il n'y a personne qui soit de la spécialité.

But very often, scientists attend various scientific meetings (workshops, congresses, or conferences), to 'advertise' for their product and find a potential editor. Participant D gives an account on their practices.

> … On ne se lance pas comme ça dans une publication…On soumet cette idée a débat dans un colloque et son sort dépend de l'écho, des questionnements, de l'intéressement des participants… pour nous c'est une sorte de sondage.

If scientific forums provide the scientists with an opportunity to weigh up the impact a research paper may have, selecting the appropriate journal will also save them from unfavourable reviewing, as participants A and B respectively explain:

> Je cible la revue en lui proposant un travail de son niveau

> ******

> On cible la revue où l'on a le maximum de chance pour que notre travail soit publié…On essaye de voir a quel niveau on peut placer le travail.

Participant H thinks that a journal is primarily chosen for its focus, speed of publication, but basically, the scope of the research results. He explains the reasons for his choice:

> Premièrement la spécialisation. , le journal se rapporte au profil du travail. Deuxièmement parce que c'est un journal assez bien coté. Ce n'est pas le top mais on a une classification. Dans le domaine de la physiologie le premier c'est le **MJP**, le 2$^{eme...}$, le 3^{éme} ...donc on choisit en fonction justement de la consistance de l'article.

Even if the Algerian scientists believe that their individual work is of some value, they never venture submitting manuscripts to high ranked journals because their local research environment runs counter their aspiration, and their submission may get rejected. Participant A accounts on his previous experience and present difficulties:

> Il y a des revues où tu es bien content de placer un papier pendant toute ta vie ; et donc c'est une référence que de publier dans ces revues ci. Depuis que je suis rentré en Algérie je n'ai jamais pu replacer un article dans cette revue parce que j'ai estimé que la qualité du travail que je fais ici n'est plus la même.

On the other hand, participant E explains that publishing in famous journals requires being under the aegis of a well known scientist:

> …. ***phytochemistry,*** en biochimie végétale, est mondialement connue. Elle est bien cotée. C'est d'ailleurs pour cela qu'on ne peut pas y entrer sans avoir quelqu'un de connu parmi les coauteurs.

But the case of participant G is the most interesting. It shows a real instance of the socially constructed nature of science writing. The Algerian scientist explained that if she had accepted publishing her results in one of the top quality journals in her field, the value of her paper would have been downgraded. The textual revisions which the journal editor suggested contribute to lower the value of her findings. The interviewee

provided explanation why her paper was rejected despite the positive comments of the peer-reviewers:

> …par exemple ***Human Mutation*** est un journal très coté l'article n'a pas été accepté sous cette forme on m'a demandé de le changer, de l'élaguer. Pour moi faire ça, ça le dévalorisera parce que ce n'est pas un travail qui n'a pas un niveau scientifique; c'est un travail qui a un bon niveau scientifique…. Je préfère encore faire d'autres manipulations et en faire un travail plus complet que de le mettre sous forme de notes…

Though unique in our data, this situation is typical of what Myers (1985b:146) views as an instance of "negotiation of status". The author argues that "disagreements over allowable length, for example, can be seen as "negotiations of status". He added "when referees comment on the form and style of a manuscript, they may also be commenting on its claim". Aware of the fact that altering the form of an article affects the status of the claim, our interviewee preferred preserving the strength of her claim, but publishing in a lower ranked journal. (Because the case is of particular interest, we have added the reviewers' and the editors' comments in appendix G).

Discussing one's work, targeting a journal are certainly important stages in the pre-writing process. They not only lay the foundations for the writing stage, but they also help the author determine the audience for which the written product is intended. Identifying one's audience implies writing for a particular type of reader and writing according to certain norms and conventions which are specific to the scientific community and to the journal in-house style. Such a skill, which requires a long period of training and apprenticeship, is almost totally missing from the Algerian scientists' previous learning experience. None of the interviewees, in this study, was given the basics on how to write in science. When asked about how they coped with their disciplinary demands, scientists described their informal and individual strategies that helped them to 'get by'. Their strategies are varied, but their writing

skill developed essentially out of their extensive reading and exposure to similar materials.

5.1.2. Drafting and Writing

The process by which participants in this study write their articles is not idiosyncratic to Algerian scientists. Writing straight in English then having the paper edited, or writing in French then having the paper translated are two strategies which are found to corroborate with the findings of previous studies on NNS scientists' writing. St John (1987), Bloor (1984), and Ventola and Mauranen (1991) have respectively found that Spanish and Finnish writers had recourse to the same approaches. Despite its disadvantages: costly charges, time-consuming procedure, uncertainties as to whether the intended meaning is faithfully conveyed…, translation is adopted by nearly all the scientists in this study. Participant C explained the long process she went through to draft the paper:

> D'abord en français ; nous ne l'écrivons pas directement en Anglais, et une fois qu'il est bon, on le passe à la traduction .Pour ***Cariologia***, j'avais essayé de traduire toute seule. J'étais là, ici, j'ai traduit et je l'ai donné à une collègue biologiste anglophone. On a travaillé ensemble pour me faire la traduction ; je l'ai envoyé mais on m'a dit que la traduction n'était pas bonne, je l'ai envoyé en suite a Orsay et là bas ils ont un autre système de traducteurs spécialisés qui se font payer par nombres de pages, ou bien ils procèdent eux mêmes à la traduction. Ils ont toujours un parmi eux qui est anglophone.

Using the same strategy, participant B makes an account on his own experience:

> La rédaction se fait d'abord en français et puis au fur et à mesure on écrit soit des termes soient des phrases en anglais pour que la traduction du français à l'anglais soit facile pour le traducteur. Ou bien on fait appel à des collègues, avec qui nous travaillons; aptes à rédiger un article en anglais et avec lesquels on travaille en collaboration en leur suggérant des termes des phrases

But participant E pointed out the constraints which are imposed by such a system:

> …cette manière de faire est un peu lourde. On aurait aimé écrire l'article directement en Anglais ça nous aurait évité pas mal de perte de temps mais on est obligé de passer par le français… .

Shared between the need to fulfil her role properly and aware of her imperfect English language skills, one of the participants C expressed her dissatisfaction:

> C'est le système D …" she qualified it " …il n'y a pas mieux que de connaître l'Anglais soi- même.

'Only way' for these scientists, translation is also an 'easy way out' for others, as participant D made it clear:

> …On rédige l'article en français, on le soumet à des collaborateurs étrangers qui eux même désignent des traducteurs, et ce pour aller vite.

'Only way' or 'easy way out', whatever reason is given, translation is an inescapable stage in the process for getting published. However, Scientists who try to avoid the translation grip have to rely on their 'ingenuity'. Participant G, who is publishing for the first time, argued that she refused being pulled by two brains:

> …J'ai un style qui m'est propre. Si une deuxième personne devait écrire, il y aurait deux styles différents. Je n'aurai pas été d'accord avec elle et là çà aurait créer d'autres problèmes. Qu'on me corrige, je suis d'accord mais qu'on écrive à ma place NON ; je revendique mes erreurs.

Participant A, who is the most experienced author, provided the same argument, showing clearly the dual constraints which article writers are constrained by: The conventions of the genre and the journal in-house style:

> Personnellement je rédige en tenant compte des règles générales de la rédaction de l'article…. je rédige l'article selon les règles générales… directement en Anglais (c'est à dire dans mon anglais à moi) ensuite compte tenu du contexte etc. je commence par la suite a réfléchir à quelle revue je peux le proposer. Une fois que j'arrête le nom de la revue à laquelle je vais le soumettre là je le mets aux conditions de cette revue là .et une fois je l'ai mis aux conditions de la revue, je le revoie

> dans sa rédaction etc. je le présente a quelqu'un de l'anglais, un ami un collègue…pour essayer de le mettre en conformité au point de vue de la langue.

The writing skill, as described by the scientists in this study, has been acquired through apprenticeship. Extensive and intensive reading provided them with the essentials. For example, Participant F described his sources of inspiration.

> En réalité c'est en lisant des articles en anglais qui sont a 99% en Anglais et traduits ou synthétisés par moi même en français pour faire mon expérimentation. Donc quand je rédige en français ce n'est qu'un retour vers des articles que j'ai lu en anglais. Donc s'il y a des termes que je ne comprend pas je cherche dans le dictionnaire mais sur la conception du texte, la manière de présenter une expérience donnée je reproduis d'autres articles même inconsciemment et c'est comme ça que le premier jet de l'article du français en anglais a été fait.

As explained in the quotes above, the writing process in these situations consists of writing the draft in English then having someone edit the language errors. But the composing process itself is somehow what St John (1987:116) referred to as a "jigsaw building". It consists of cutting bits from here and pasting them there. Skilfully, the scientists, in this study, described their approach which consists of borrowing words, expressions and sentences to reproducing whole sections. Participant I, for example, revealed that:

> … je me suis inspiré des articles scientifiques qui parlent du même thème empruntant certains mots certaines phrases, quelques tournures… qui correspondent à mon travail.

Participant C, also adopted the same procedure for writing the materials and methods section, explaining that scientists often use a standard pattern for this part.

> …quelques fois, par exemple pour matériel et méthodes ce sont les mêmes phrases stéréotypées qui reviennent, alors on les reprend et notre problème pour cette section est réglé.

Pragmatic in their article construction, Algerian scientists make use of previous experience both in terms of research paradigm to which they are scientifically committed and also in terms of writing models. But this "jigsaw building" strategy has also its drawbacks. Borrowing chunks from others' writing does not solve the problem, it rather creates new ones. Such a strategy is likely to result in unreadable material which is often a source of misunderstanding opposing readers to writers. It is not surprising then to read such a referee's comment as addressed to participant H.

> I have difficulty in understanding the argument here and how it relates to the next sentence. I suggest clarification in the text.

This request for thematic clarification, which is recurrent in the referees' comments, typifies the dangers that may result from the described strategy. It suggests that 'borrowings' that can not be adapted are likely to break the flow of argument, creating a situation whereby the reader can not understand how particular information fits within the structure of the text. Writers need to be aware of the different discursive and rhetorical differences in writing if they are to avoid such pitfalls.

5.1.3. Revising and Editing

On the whole, the scientists we had interviewed in this study noted that their papers had undergone at least three types of revisions: a language revision, a specialist revision and an editorial editing. The type of corrections made largely depends on whether revisers are outsiders or insiders to the scientific community.

– A local language revision which is some kind of proof reading whereby the reviser chases the most obvious lexical and grammatical errors

– A specialist revision: a detailed language checking, taking into account the norms of scientific discourse before a manuscript is submitted to evaluation. The reviser is often a skilled native speaker employed by the commercial services of the scientific laboratory the researcher is affiliated to.

– An editorial editing (the Galley proof reading): a professional copy editing procedure which occurs once the manuscript has been accepted for publication. The revisers are experts who undertake a scrutinized type of correction that examines every single detail of the paper according to the in-house style of the journal (see appendix F).

To the Algerian scientists, the local reviser is very often a language teacher or a colleague who graduated abroad in an English speaking country. Occasionally, the scientist chooses an English Speaker co-author for whom the task is assigned. But very often the scientist prefers pairing up with tutors from northern countries, who have much experience and available facilities for scientific publishing. Once the first draft is written, it is submitted for editing, explained participant B.

> …mais quand l'article est proprement fait, je le fais lire par ceux qui sont Anglophones.

Thus "Anglophone" is a broad category, but here, reference is made to the English department teachers. Not qualified for such a task, language teachers are the most unsuccessful revisers. They not only lack scientific competence to understand what they revise, but even their linguistic proficiency for writing scientific discourse is at stake. Participant A lamented:

> Je n'ai jamais été satisfait…je dis bien jamais …parce que quand je revois une copie avec quelqu'un, il transforme un certain nombre de choses qui, au passage, perdent le sens que je voulais leur donner… Mais j'ai l'impression avec un anglophone qui serait d'essence littéraire etc. on ne parle pas du tout le même langage…je suis persuadé au fond de moi même que si je rédigeais un papier avec lui ça serait au

> moins aussi incompréhensible que le mien et donc ça ne règle pas le problème a mes yeux.

A value judgement or failed expectations, this comment disqualifies the language teacher for the scientific paper revision. This view is reinforced by participant H's evaluation:

> …Ils n'apportent pas grande chose… C'est une lecture superficielle qu'ils font…même quand ils lisent eux même, ils éprouvent des difficultés à corriger.

But this negative feedback is not shared by all. Participant B still believes that the language teacher's contribution, at least at the textual level, can not be neglected. Eagerly, he said:

> Sa contribution est importante. Sa contribution apporte des changements surtout au niveau de la grammaire…Il y a quand même un acquis la dessus.

The language teacher's limits as far as scientific writing revising/editing is concerned cannot be denied, and the issue of his status of an outsider to the community is acknowledged by all. His textual revisions and language editing hardly meet the exigencies of the scientific community. Still, the question that ought to be asked is not whether language revisers are qualified for the task or not, but whether the language variable plays an important role in manuscripts evaluation and whether imperfect language skills impede the publication process.

5.1.4. Submitting for Evaluation

According to our informants, never had any paper been rejected because of its language inappropriateness, challenging the view that sees language inadequacy "…as an excuse for rejecting unwanted papers" (Sionis, 1995:100). Scientists in this study argue that submitted manuscripts are primarily assessed against scientific norms which include: study design, reproducibility of research techniques, literature

cited, journal focus etc. Participant E, for instance, believes that 'originality of work' is what matters most:

> …tout ce qui est exploit, tout ce qui est original…tout ce qui est nouveau s'il est bien expliqué, s'il est bien conçu, il est accepté. C'est ça les principes de la revue.

Taking a broader perspective, participant B sees the evaluation related to the whole research environment. Also a reliable work is often equated with the cited literature:

> Ce qui importe pour eux c'est l'environnement de recherche….la fiabilité du travail c'est aussi ce que nous citons comme travaux.

A further ingredient is added by participant D: the journal conventions.

> Au niveau des revues scientifiques, c'est la valeur de l'article qui prime. Ce qu'ils jugent c'est le contenu scientifique d'une part et d'autre part, la forme compte pour beaucoup. Si un article ne respecte pas les conventions d'un journal, il est rejeté.

"Original work", "reliable research design", "coverage of the related literature", "adherence to the journal conventions"…are the normative criteria which all scientists are aware of, and which they endeavour to meet to gain acceptance for their manuscript. Yet, there are also some variables which remain out of the scientist's control. One of the scientists, participant C, reckons that there are sometimes some "subjective reasons" which lie behind unfavourable reviewing. She explained that some subjects are the preserve of particular research teams and "stepping on these research areas" might be a threatening issue:

> …C'est un cas de subjectivité parce que le sujet était leur 'chasse gardée'… alors on a compris qu'il ne fallait pas marcher sur certaines bandes.

Participant E, on the other hand, raised the thorny question of "the prejudice against submissions coming from unknown places" (Swales, 1985a:100). He explained why scientists prefer such addresses as Institut PASTEUR in Paris, l'INSERM (Institut

National des Sciences Et Recherches Medicales) or l'INRA (Institut National de Recherche Agronomique) rather than that of the University of Constantine. He admitted that making use of the reputation of the laboratory the scientist is affiliated to is a precautionary measure which would possibly give his research more credit and greater chance for getting published:

> L'adresse a plutôt un sens pour le journal; l'adresse d'un laboratoire déjà connu contribuera à faire passer la publication; une adresse fait généralement référence à un nom.

Indeed, no scientist denies having recourse to 'the old boy network'. The importance of including the name of an outstanding figure within the co-authors list is a safe way for ensuring the acceptance of a paper. Although the role of these 'godfathers' may differ from one situation to another, their name is a real passport to the publication world. Their roles, however, are described differently. On the one hand, he is the principal agent to whom scientists owe too much. Participant I qualified his role as the corner stone of the research programme:

> …C'est la cheville ouvrière de ce programme.

Consenting with participant I, participant G described metaphorically her 'godfather'

> …c'est le protecteur… si l'article est comme ça, c'est grâce a lui… c'est comme de l'or au fond d'une mine. Tu ne le vois pas. Il faut d'abord enlever toute la pierre et c'est là où tu vois une pépite d'or et c'est justement lui qui a enlevé beaucoup de choses. Il a remis les choses en place. Il m'a poussé à expliquer certains éléments, à enlever carrément d'autres qui cachaient, qui n'avaient pas beaucoup d'importance…donc lui m'a permis de bien montrer mon article.

On the other hand, his name fulfils his function, participant D observed.

> …et par moments, on associe des noms qui n'ont même pas contribué. C'est fait exprès…le fait d'associer quelqu'un de connu avec nous, ça passe très vite. Il n'a rien fait mais on est obligé de l'associer.

More than a need, it is a MUST, participants B and H noted:

> Il faut être parrainé, il faut être membre associé ou à la limite être avec quelqu'un qui a l'habitude de publier dans ces revues. (B)

*****

> Le dernier (co-auteur) effectivement c'est le chef du laboratoire. C'est lui qui chapeaute le travail même s'il n'a pas contribué. (H)

The evidence is provided by participant E who showed one of the rejection letters he received for one of his submitted manuscripts.

> ***The entomological Society of Canada*** requires one author of a paper to be a member of the society.

Whether his contribution is effective or honorary, the godfather's name is both a 'quality label' and a 'key' that opens the publication door, as summed up by participant E:

> Le nom du professeur c'est l'étiquette ou le laissez-passer.

For Algerian scientists, this context in which the scientific practice takes place seems to determine the fate of a publication. The linguistic issue is not negligible, but it is not as important as the scientific craft. Often it is relegated at the back stage as long as individual solutions are found to sort out the problem. Participant A thought that:

> Jamais un papier n'a été rejeté pour des problèmes de langue.

Similarly, participant B noted that rejection on linguistic grounds is rare.

> C'est très rare. On juge surtout la qualité scientifique. Mais on ne peu pas négliger cet aspect. B

All other scientists, however, admitted not having faced the problem; they always take the necessary measures to ensure that the paper is carefully revised before

landing on the referees' hands. Participant's D comment is illustrative of his colleagues' views.

> Cela serait bien possible mais je pense que c'est très rare. La publication qu'elle soit écrite en français ou en anglais, elle est d'abord soumise à des services spécialisés. Nous passons par des intermédiaires mais cela… est dans notre intérêt.

Nevertheless, an examination of some drafts which scientists gave us shows that referees severely evaluate the work that they do not understand. The following comments are self explanatory:

> The text is not easy to follow; this is often the result of the English used (From ***Microbiol Ecology in Health and Disease Journal****)*
>
> The manuscript should be reviewed for appropriate English structure and rewritten where necessary to ensure the authors' meaning is correctly and easily interpreted. (From ***Infect Diseases Journal***)

Clearly, and as anticipated, these last comments show that the editorial board members are concerned with the language variable. How far does this interest go? The answer seems to be confined in the assessors' mind, and so far there has been no available source which may document us as to whether the quality of reporting is an influencing factor on the editors' decision-making for acceptance or rejection of the submitted papers. In the following section, we attempt to give provisional answers to this question as it appeared in the editors' views.

5. 2. The Editors' Perspective

One of the disturbing features reported on in the previous section of this chapter, has been the contention of almost all scientists that the rejection of their manuscripts was not on linguistic grounds. This fact runs counter to the editor's views. We propose to provide evidence for this conclusion. We propose to provide a

detailed account on the editor's opinion as regards the importance of the language variable in the assessment of manuscripts. Below, we analyse each of the questions that appeared in the editors'questionnaire.

5.2.1. Factors Influencing the Evaluation Process

Question1: The intrinsic quality of scientific work is the principal criterion for publication. However, other values might influence your decision when assessing a manuscript. Please rank these on a scale from the most important (with the score of 5) to the least important (with the score of 1).

Editors are said to have a range of values concerning the evaluation of manuscripts. These are most of the time regarded as scientific criteria. In his investigation, Gosden (1992: 129) reported that editors put greater emphasis on the "scientific merits of a paper". The Algerian scientists in the previous section reported that editors and referees assessed their manuscripts against scientific values. Such an attitude seems quite logical if we assume that the editors' role is to facilitate the impartial assessment of research and to ensure that articles meet the journal's standards of quality, and scientific validity. However, one cannot rule out the possibility that editorial board members may have other values than the scientific criteria which influence their decision-making. Algerian scientists also observed that the name of 'a leading figure' in the field and 'the address of a well-known scientific institution' could also account for the acceptance of their papers. Being taken under the protection of a well known scientist or being known as a member of a school or society will certainly make the publication task easier. To what extent do these strategies hold true?

Question 1 was devised to determine the editors' preferences when assessing a submitted manuscript. As shown in the question, they were asked to rank on a 5-point scale the criteria that might influence their decision when judging a manuscript. Although the respondents find it difficult to make a choice, the results show that all the editors have a consistent attitude regarding the criteria that influence their decision making. They value most an original work which adheres to the philosophy and aims of the journal. The quality of reporting is undoubtedly an important variable. However, the attributes of the author(s) and place of origin of manuscripts do not seem to affect the editors' decision making.

For the editors, a manuscript is assessed first and foremost on its intrinsic scientific quality. Editors and peer-reviewers are mainly interested in the research process and the research findings. Their views totally contradict the Algerian scientists'. While these latter deem these factors great importance, as we reported in section (5.1.4); all editors consider the author's (or one of the co-authors) personal attributes as trivial matters.

Though quite revealing on the research environment and the reliability of results, the place of origin of a manuscript did not seem to be a crucial criterion. No editor, in this study, admitted assessing a manuscript on these grounds. Clearly, discriminating papers on geographic grounds would impair the transparency and objectivity of scientific evaluation.

But if these issues generated contradictory views, this is mainly due to our question. We might have been too intrusive. We might have been stepping in on editors' toes to open their evaluation to public scrutiny. We are raising sensitive questions and, indirectly, we might have pointed at discrimination. The questions

might have been embarrassing and our respondents might have chosen to reply in a way that made them feel comfortable.

5.2.2. The Quality of Reporting and the Rejection of Papers

Question2: Do you think the quality of reporting could be a major cause for rejection? If yes. Why?

As shown above, the quality of reporting is among the important criteria which editors consider when evaluating submitted manuscripts. How far does this go? According to the scientists, in this study, language inadequacy does not seem to be a major cause for rejection. What do editors think? Answers to question 2 are tabulated below (table 12). Results indicate that if there is no consensus around the answer, we can speak of concurrent view.

Table 12: The Editors' Perceptions of the Quality of Reporting and the Rejection of Manuscripts

	n	%
yes	23	82
sometimes	4	14
rarely	1	4
no	0	0
	N=28	100%

While 82% of our respondents believe that rejection on linguistic grounds can definitely occur. 14% believe it could be the case. Only one respondent thinks that it is rarely the case. The ***Ecology of Food and Nutrition Journal*** editor contends that inappropriate language leads to rejection from publication. Clearly, he states that "Rejection of a manuscript solely on the grounds of English usage is rare". But the selected views below show that unless the criterion of quality of reporting is met, the manuscript will be rejected. In their own words, the editors argue:

> …..As a reviewer and editor, I often get manuscripts that are horribly written, I always reject them immediately. Such manuscripts cannot be published in any decent journal. On the other hand, it's not a reviewer's or editor's job to correct trivial language errors. So there is no choice but to reject badly written manuscripts. ***Algorithms for Molecular Biology*** **journal**
>
> We reject manuscripts with bad English and suggest the authors to have external help from native English speaking colleagues or professional companies. After re-editing the English the resubmitted manuscript is evaluated for technical Excellency. ***Arid Land Research and Management journal***
>
> The correct language is the basic requirement for submitted manuscripts. No journal can publish articles containing grammatical and stylistic errors without affecting its image and credibility. Native speakers of English are privileged. NNS must simply ask for help native speakers or make use of the available Internet services for the final editing of the text. There is no way round. Even a very good knowledge of English cannot assure that the text does not contain errors or other weak points, which are well visible to the native speakers. ***Acta Protozoologica Journal***

As illustrated above, “poor language use”, “unsatisfactory writing style” “bad English” “incorrect language” “horribly written”… are all good reasons for rejection. This is a valid motive as long as the reputation and the prestige of a journal are at stake. NNS who want to see their papers in print have no choice than go for native speakers hunting or publish in low impact journals. Rejection on linguistic grounds is fully justified.

5.2.3 The Fate of Rejected Manuscripts

Question 3: Do you think rejected papers preclude authors from publication?

Question 4: What is the authors’ usual attitude towards rejection?

Using a multiple choice format, we asked these two related questions, seeking to understand what authors usually do when their papers get rejected. It is often heard that scientists whose work is not recognized are likely to become discouraged

with the research, especially when they cannot get the resources to carry it out. But in this study; there seems to be an agreement around this question. Both editors' and the scientists' views corroborate. Rejected papers do not preclude authors from publication. All the editors (100%) responded that rejection does not preclude authors from getting published. In other words, article writers never lose hope for seeing their work into print. They never abandon the idea of publishing, but other solutions are found to get their efforts rewarded. Almost on equal terms, editors think that authors either re-submit an improved draft to the initial editor, or submit to another journal (Scientists in our interviews have all replied that the common practice is to re-submit to another journal). Used to editorial rejections, scientists never dare ask editors to reconsider judgment, nor do they abandon the idea of publishing. We can, therefore, infer that rejected papers are often published in lower ranked journals which, obviously, cater for a more restricted readership. Very often rejected articles are also submitted to local journals. These journals cover local needs and are worldwide invisible. Their editorial boards are usually less demanding. Rather, they are more encouraging for home production.

5.2.4. The Editors' Perceptions of the Most Prevailing Language Errors in Poorly Written Manuscripts

Question 5: What types of language errors are often found in poorly written manuscripts?

This question tries to determine the editors' view regarding the linguistic features that poorly written papers exhibit. The purpose is to draw some generalizations as regards the language related problems that NNS usually encounter in their research paper writing. Results are presented below in table 13:

Table 13: The Editors' Perceptions of the Most Prevailing Language Errors in Poorly Written Manuscripts

Incorrect use of tenses	28	100%
Sentence structure	28	100%
Misuse of words	22	78%
Spelling	14	50%
Noun problems	11	39%
articles	09	32%
connectors	05	17%
prepositions	05	17%

All the editors 100% think that syntactic problems, in particular the use of tenses, and sentence structures seem to constitute the major problem for poorly written manuscripts. They also consider that lexical items represent a source of trouble though to a lesser extent than the grammatical one. 78% of these editors find that the misuse of words is the most prevailing error in the lexical category. 50% and 39% respectively believe that, spelling and the use of compound nouns is also a feature of poorly written manuscripts. Articles, connectors, and prepositions do not seem to affect very much science writing, since only 32%, and 17 % have mentioned them as occurring in inadequately written papers. Though generalizations cannot be made, we can at least give these linguistic features greater attention in teaching science classes. The present findings will be compared with our textual data in chapter six.

5.2.5. The Editorial Bias against NNS Submissions

Question 6: Do you objectively feel that there might ever be an editorial bias against submissions originating from unknown places?

The prejudice against NNS submissions has largely been echoed. Swales, (1985a:100), the most outspoken advocate of this issue, has on many occasions lamented the "editorial prejudice against NNS manuscripts, emanating from unknown places of the world". Question 6 is derived from his work which views this bias as one of the impediments for the NNS visibilility. We have amply supported the issue in chapter one (section1.1.3.4), but what editors think is not sufficiently researched. Though sensitive, we believe that the question is worth asking. Table 14 accounts on the different views, as they appeared in our questionnaire.

Table 14: The Editors' Perceptions of the Issue of Bias against Submissions from Unknown Places

	n	%
Definitely no	19	68
Generally no	6	20
Possibly	3	12
yes	0	0
	N=28	100

As anticipated, the views are shared. 68 % of the editors seem to reject the idea that there is an editorial bias against NNS submissions, and 20 % disapprove it. The very few (12%) show no commitment; leaving the door open to some doubt. It is possible that there might be some discrimination. In reply to our question, The ***Biogeosciences*** journal editor, for example, replied that ["….manuscripts from Germany are much better than those from most African Countries"]. This statement of fact is certainly true, but isn't it a subliminal prejudice against papers originating from the less developed countries? Isn't it an 'a-priori' bias in favour of developed countries? Moreover, this quote from the ***Biology*** journal editor is even more expressive of this situation.

> Our papers are mostly from Europe and North America and the quality of the English language has always been acceptable…When authors from non-English speaking countries submitted, their language usage was effectively equivalent to a native manuscript, and in most of those cases one of the authors included someone in an English-speaking or European country.

Bias against NNS is difficult to prove, but bias in favour of the developed countries is easily justified. Developed countries have reached such a level of Excellency that even their linguistic performance is equated with the native counterpart. Editors nowadays speak of papers from "Europe and North America" on the one hand, and other parts of the world on the other. We think that Swales' view on the subject is relevant to the point. Isn't the very idea of streaming authors on regional grounds in itself discriminating? Isn't the very idea of including a native speaker in the co-authors list a restrictive and exclusionary measure? Doesn't this last idea simply imply that the inclusion of a native speaker is a prerequisite for the NNS' entry to the research world?

5.2.6. The Textual Revision of Manuscripts

Question 7: Do you think the linguistic changes brought to revised manuscripts are often meant to moderate the level of scientific claims advanced by authors?

This question is derived from Myers' work (1990). According to the author, the textual changes brought to revised manuscripts are meant to moderate the level of claims advanced by article authors (see section 3.3.3.). The purpose of our question was to find out whether the claim made by the author was applicable to the NNS' papers. The results for this question are tabulated in table 15 below.

Table 15: The Editors' Perception of the Textual Revision of Manuscripts

	n	%
Totally agree	08	29
Partially agree	07	25
Don't know	10	36
Partially disagree	03	10
Totally disagree	00	00
	(N=28)	100

The editors' views are not consistent concerning this question. We believe that answer to this question assumes prior knowledge of Myers' claim. This could be the reason why 36% of our respondents replied "Don't know". Although we reported on this issue in the previous (section 5.1.1), we believe that the Myers' claim is not frequently encountered in the NNS context. The scope of the research is likely to be different in both situations. While researchers in Myers' case seek to challenge an established view, by raising controversial issues; NNS and third world researchers try to place their contribution within the context of existing literature, avoiding any tension-rising situations. Thus, the revision process in both situations has a different purpose. The linguistic revision process in Myers' study is meant to lower the author's claim and adjust it to the hierarchy of the scientific community structure; whereas the textual revision of NNS papers is meant to reshape the paper in 'good English'.

5.2.7. Ways to Improve the Situation

Question 8: What suggestions could be made to improve the situation?

This question seeks to get the editors' insights on how the non native authors' situation could be improved. This question did not generate many suggestions. 75% did not answer the question. The remaining 25% stressed the importance of learning English and improving the writing skill.

Nevertheless, we can duly acknowledge that some editors are fully aware of the fact that NNS are disadvantaged when writing in English. Some of them even show a great sensitivity towards the difficulty in publishing in English, as reads below:

> …My 'ease of use' of English and the editorial style contrasts starkly with the difficulties faced by scientists for whom English

> is a second language, and who have to cope with the much more restricted style of a scientific report. I think that we- those of us who grew up speaking English- greatly underestimate the extent of these difficulties for non-native speakers. ***Embo reports.***

However, the increase in the number of submissions, the manuscript processing times, and the daunting task of evaluation do not allow editors to deal with what, in they regard as ["trivial grammar mistakes"]. It will come as no surprise that the heavy burden of the correction work is put on the authors' shoulders. ["It's not a reviewer's or editor's job to correct language errors"] has replied one of the editors in this study. Whatever their degree of sensitivity to the NNS issue is, editors just find it impossible to devote a great amount of their time correcting language mistakes. How can the situation be improved?

Editors suggest that authors "seek external help", "make use of the available internet services", and ultimately "make real efforts to learn and improve their English". The ***Algorithms of Molecular Biology*** editor makes a parallel with his own experience, showing how he has himself overcome the language barriers.

> NNS simply have to make real efforts to learn and improve their English. That's what I did (I'm a NNS myself)**.**

Conclusion

Data analysis in this chapter was meant to throw light on how scientists write their papers in English, and how they get published in international journals. Their descriptive accounts informed us that Algerian scientists have their own practices for constructing their articles. Their writing process is a composite of ingenious strategies drawn from their reading, their experience, and their interaction with peers. Drafted in some language, the papers undergo a series of linguistic manipulations until the expected standards are achieved. The writing actors are many, but the fate of the

papers is often determined by the social ties and the social networks the scientists are related to. Whatever the degree of influence these ‘invisible colleges’ might have the language proficiency remains an indisputable criterion. Submissions which do not meet editorial expectations are rejected, and accepted ones are always revised. Why is revision a necessary stage in the process? What changes are brought to manuscripts? are some of the questions which we shall provide answers to in the next chapter.

CHAPTER SIX

Textual Data Analysis

Introduction

In the previous chapter, we described the scientists' dissatisfaction with the language teachers' assistance, and we reported on the editors' reluctance to purge the language of infelicity. What is it that makes the task so arduous? What is it that makes the revision /editing process so repulsive? An examination of the various drafts of the writing samples of the case study subjects has shown that the task is indeed more difficult than catches the eye. The revision process requires a great deal of scrutinized work. The complexity of the task explains why a paper takes so long to get published. And the language exigencies make it clear why many papers are rejected on linguistic grounds. The purpose of this chapter is to answer our third research question, by analyzing the revisions brought to the accepted manuscripts and trying to provide explanations for the reasons that lie behind the textual changes. The analysis of such revisions is important because it is likely to be revealing of both the scientific community expectations as regards the conventions that govern science writing and the common pitfalls which must be avoided by NNS science writers.

6.1. The Linguistic Analysis

Previous research (Myers, 1990; and Ventola and Mauranen, 1991) has shown that textual revisions of research papers are mainly operated on the syntactic and lexical levels. In other words, the changes are concerned with both vocabulary and grammar. For some reason, a grammatical form or a lexical item might be preferred to another. In this study, we hypothesize that the revision process is socially

constructed. Revisions are grounded in the scientific community practices and body of beliefs, and we anticipate that the revision process is a system which purges the language that is not consistent with the norms of scientific discourse (Hypothesis 3 in section 4.2.). Our linguistic analysis for this section will therefore be concerned with providing support to this hypothesis. Two questions will be answered:

– What types of language revisions are operated on research papers?

– What significance do these revisions bear when analysis is grounded in a social constructionist perspective?

In order to do this, the scientists' drafts were examined, the revised items were classified using the text revision scheme, we have adapted from previous studies, mainly from Ventola and Mauranen's (op.cit.) study of non native writing and native revising of scientific articles.

Examination of the drafts and the revisers' annotated comments revealed that textual revisions are essentially concerned with the lexico-grammatical features (table 16 and 17 below). For the *Toxicokinetics* paper, these are respectively concerned with lexical choices (43%), tense choices (17.5%), prepositions (14.5%), articles (10.3%), spelling (7.8%), Noun phrases (4.2%), connectives (1.8%), and sentence structure (0.6%). The second paper (*Globin Gene*), however, did not exhibit as many revisions as the previous one. The paper has undergone several language revisions before the specialist's one. The changes are mainly concerned with lexical changes (55%), tense choices (31%) and sentence structure (13%).

Table 16: Summary of Suggested Lexical and Grammatical Revisions (Toxico-Kinetics Paper)

Categories	Number of Revisions	Percentage of Revisions
Lexical choices	71	43%
Tense choices	29	17.5 %
Prepositions	24	14.5 %
Articles	17	10.3 %
Spelling	13	7.8 %
Noun phrases	7	4.2 %
Connectives	3	1.8%
Sentence structure	1	0.6%
TOTAL	N=165	100%

Table 17: Summary of Suggested Lexical and Grammatical Revisions (Globin Gene Paper)

CATEGORIES	Number of Revisions	Percentage of Revisions
Lexical choices	25	55%
Tense choices	14	31%
Sentence structure	6	14%
TOTAL	N= 45	100%

As can be observed, the most prevailing categories are the lexical revisions and tense choices for both papers. For the *Toxicokinetics* paper, these account respectively for 43% and 17, 5%. Similarly, these represent 55% and 31% for the *Globin Gene* paper. Prima facie, these findings confirm the editors' views concerning the most frequent language errors which they encounter in poorly written submissions. Unanimously, editors responded that tense choices and to a lesser degree, lexical choices constitute the most troublesome areas (section 5.2.4.). In this section, we shall examine each of these linguistic categories..

6.1.1. Lexical Choices

Godman and Payne (1981a: 24) classify the lexis of science into two categories: *technical terms* and *non technical terms.* They define the technical ones as "those for which there is a congruity of concept between scientists, whatever the language used". Non technical ones, however, "consist of all other terms occurring in the language of science" (ibid). The vocabulary of non-technical terms involves the terms of general language such as *subordinators, quantifiers, articles* etc. as well as the terms "that can be described as the basic list for usage in Science". Whereas general language terms remain unchanged in science writing; the terms of the "*basic list"* are widely used in all fields of science and have different and usually more restrictive meanings in scientific contexts than they have in general usage. In this study, we shall consider only this last type. Thus Lexical revisions in this study are concerned with any substitution, modification or deletion that any non technical term or expression has undergone. Table 18 and 19 provide a full account of the lexical revisions as they have appeared in the drafts and the revised papers of the two studied papers.

Table 18: Suggested Revisions for Lexical Items: Toxicokinetics Paper

	DRAFT	**REVISED VERSION**
1	the aim of this work is to study …,to **look for** lead metabolism	the aim of this work was to study …, **to investigate** lead metabolism
2	lead accumulated **decreasedly** in bone, liver and kidney	lead accumulated **to the greatest extent** in bone, following by liver and kidney
3	**according to this sensitivity,**	**in response to this**
4	experts **established**	experts **set**
5	as lead is liberated from **local and disseminated** industrial areas	as lead is liberated from **distant…**
6	weekly intake **can be brought from** food	weekly intake **is derived** from
7	the transfer of heavy metals… is studied	the transfer of heavy metals… is

	by **authors**	studied by **researchers**
8	**…**and the possible **variations** of lead kinetics **produced by** Zn and Cd in order to **mimic** a very…	and the possible **changes in** of lead kinetics **induced by** Zn and Cd in order to **model** a very…
9	the transfer of Cd …was studied…and will be the topic of another **paper**	the transfer of Cd …was studied…and will be the topic of another **report**
10	the ewes were **held** in the sheepfold of …	the ewes were **kept** in the sheepfold of …
11	the ewes were divided in three **exposed** groups	the ewes were divided in three **treated** groups
12	**previously,** we had to dilute the samples	**prior to measurement,** we had to dilute the samples
13	lead was **determined** by AAS…	lead was **measured** by AAS…
14	the ZPP values were determined **on total** blood samples using an **adequate** hemato…	the ZPP values were determined **for all** blood samples using an **appropriate** hemato
16	toxicokinetics analysis of blood lead were **computed** using a program …	toxicokinetics analysis of blood lead concentration was **performed** using a program …
17	the ratio …was calculated **from the equation**	the ratio …was calculated **as follows**
18	After the end of exposure , blood lead levels decreased in a bioexponential like **pattern** in all animals	After the end of exposure , blood lead levels decreased in a bioexponential like **manner** in all animals
19	At the end of the **sampling,** the blood lead levels …	At the end of the **recovering**, the blood lead levels …
20	the blood lead concentration was **best** described	the blood lead concentrations- time curve was **well** described
21	the **average** of the lead concentrations was	the **mean** milk lead concentrations was
22	throughout the treatment , the concentrations in the lead group **stayed** lower	throughout the treatment , the concentrations in the lead group **remained** lower
23	We can discuss the selection of the lead and cadmium dosage in comparison with some **encountered** hay contamination	We can discuss the selection of the lead and cadmium dosage in comparison with some **reported** hay contamination
25	This is in agreement with a …model described in cattle by… and in the **man** by…	This is in agreement with a …model described in cattle by… and in **humans** by…
26	lead was **given** to ewes	lead was **administered** to ewes
27	this value is lower than the ones found in cattle…and in **man**…	this value is lower than the ones found in cattle…and in **humans**…
28	8.7+ 1.6 mg /kg **dry matter**	8.7+ 1.6 mg /kg **dry weight**
29	0.47 + 0.06mg /kg **fresh matter**	0.47 + 0.06mg /kg **fresh weight**
30	**The same kind of** pattern has been previously **related** by…	**A similar** pattern was previously **reported**…

31	this amount **approximates**	this amount **corresponds to approximately**
32	we can **evaluate**	we can **estimate**
33	This difference s likely to be due to a higher **ability** of bone and ovine	This difference s likely to to be due to a higher **rate** of bone and ovine
34	the mean values **varied** between 97 and 205µg/1	the mean values **ranged from** 97 and 205µg/1
35	**the same** lead concentration was found	**A similar** lead concentration was found
36	this result suggests a very **intense excretion** of lead through the milk	this result suggests a very **high rate excretion** of lead through the milk
37	similar **observations** have been **performed**	similar **findings** were **obtained**
38	when Pb and Cd **are given**	when Pb and Cd **are administered**
39	the distribution phase **becomes quicker**	the distribution phase **increases**
40	Pin. And Kam.(26) **have shown**	Pin. And Kam.(26) **found that**
41	lead is reduced when **given** together with cadmium	lead is reduced when **administered** together with cadmium
42	Nilson **observed** that	Nilson **found/reported** that
43	rats **treated** with Pb and Cd **in combination**	rats **administered** withPb and Cd **simultaneously**
44	as regards , the influence of the other elements , **giving** lead, Cd and Zn **altogether**	as regards , the influence of the other elements , **on administering** lead, Cd and Zn **simultaneously**
45	these changes induce a **lower** T1/2β	these changes induce a **shorter** T1/2β
46	zinc seems to **favour** the excretion	zinc seems to **promote**
47	Willough. **has noticed**	Willough. **Has reported**
48	In the rat, …Zn dosages **favour** the excretion of lead	In the rat, …Zn dosages **promote** the excretion of lead
49	the increase in the ZPP is **higher**	the increase in the ZPP is **greater**
50	cattle **treated at** the same dosage	cattle **administered with** the same dosage
51	after the end of the treatment , they **stay** at a high level	after the end of the treatment , they **remain** at a high level
52	the lead group received **a daily** lead chloride **administration** 2.3 mg/kg/**day**	the lead group received lead chloride **orally at a dose of** 2.3 mg/kg/**day**…
53	the ratio Vss/Vc was calculated **with the following equation**	the ratio Vss/Vc was calculated **as follows**
54	At the plateau, the mean blood lead values were…respectively to the lead, the lead cadmium and the lead cadmium-zinc group **during the exposure**	At the plateau, the mean blood lead values were…respectively to the lead, the lead cadmium and the lead cadmium-zinc group
55	the **observed** lead concentrations in the tissues …	the lead concentrations in the tissues
56	concerning the lead distribution phase, lead distributes in the **organism** of the lactating ewes	concerning the lead distribution phase, lead distributes in the lactating ewes
57	lead is widely distributed in the tissues i.e. the bones as shown by the	lead is widely distributed in the tissues i.e. the bones as shown by the

	concentration **values measured** 81 days after the treatment	concentration 81 days after the treatment
58	the same **kind of** pattern	the same pattern
59	the T ½ β **value calculated** in lactating ewes	the T ½ β in lactating ewes
60	this **result** suggests	this suggests
61	there **obviously** seems to be an interaction	there seems an interaction
62	The **level of** Z n interference	The Z n interference
63	they were kept in a good health **status**	they were kept in a good health
64	the lead concentration reached…in the lead group at the plateau **stage**	the lead concentration reached…in the lead group during the plateau

Table 19: Suggested Revisions for Lexical Items: Globin Gene Paper

	DRAFT	**REVISED VERSION**
68	A switch...occurs during the perinatal stage **consisting of** a gradual decrease	A switch...occurs during the perinatal stage **involving** a gradual decrease
69	The **continued** expression of one or both of the fetal genes...	The **sustained** expression of one or both of the fetal genes
70	The β globin gene cluster **exhibits** and **is characterised** by an increase in theHbf...	The β globin gene cluster **has...** and **produces** an increase in the Hbf...
71	In the present study, we report... where a slight increase of HPHF ...where a **slight** increase	In this study, we report... where a slight increase of HPHF ...where a **modest** increase
72	Hematological parameters from blood samples were **obtained by**...	Hematological parameters from blood samples were **measured with**...
73	**The quantitative determination** of the two chains was **obtained** by....	**The ratio** of the two chains was **estimated** by....
74	High **output** was consistently observed	High **levels of**… was consistently observed
75	...individuals with **elevated** Hbf **values**	...individuals with **raised levels** of Hbf
76	The Reverse Dot Bloss data **revealed** the **presence of** a mutation	The Reverse Dot Bloss **showed** that **there was** a mutation
77	The COT **variation** creates...	The COT **mutation** creates...
78	Southern blot analysis **failed to provide** any evidence	Southern blot analysis **did not show** any evidence
79	But sequencing of.....**revealed** a novel substitution	sequencing of.....**identified** a novel substitution
80	individuals who had the lowest **values**	individuals who had the lowest **levels**
81	the genotype analysis shows that the **raise of** the Hbf level in....	the genotype analysis shows that the **higher levels of** the Hbf in....
82	Similarly **overexpression** of...was observed	Similarly **overproduction** of...was observed

83	The detection of ....and COT **allows us** to conclude that the HPHF...is....	The detection of ....and COT **shows that** the HPFH...is
84	**A number of mutations** have been identified to **interfere** with....	**Several** mutations have been identified to **affect** with....
85	The differences in HBFH levels may **be explained in part by** the differences in the **methodology of quantifying** the HBF level	The differences **in the observed** HBFH levels may **result from the** differences in the **methods of quantification** the HBF level
86	However, **we cannot exclude the possibility** that the difference in Hbf levels **could be due to** different base substitutions in the Gg gene which may **interfere with.....**	however, **it is also possible** that the difference in Hbf levels **result from** different base substitutions in the Gg gene which may **affect ...**
87	The presence of gross rearrangement in **the γ globin gene region** was investigated	**The γ globin gene region** was explored for the gross rearrangement

Both tables exhibit a wide range of lexical changes. The reasons for these revisions are many and could range from subjective to objective ones. According to the editors, in this study, lexical items are frequently wrongly used; and editorial changes could be motivated by the 'misuse' of words. A lexical item might be replaced by another one because it is linguistically incorrect. The authors, as we have explained in section 5.1.2. have extensively relied on borrowings and on word to word translation. And lexical inaccuracy is likely to have occurred as a result of the 'negative transfer' from French, as Harouni (2005) has shown in her study.

However, the most curious cases are the changes which have occurred when two lexical items are closely related in meaning, and one is apparently more preferred than the other. This is of course an instance of substitution, or the replacement of an item by another. The second case is when some lexical items are omitted from the sentence in spite of their exactness. And this is obviously an instance of intentional deletion. We believe that these revisions are determined by some considerations other than the linguistic correctness. These might be determined

by the conventions of scientific usage and the rules of scientific writing as we have advanced in our hypothesis.

Let's consider the following pairs where (D) stands for draft, or the source text; (R) for the suggested editorial revision; and (S) indicates the sentence numbering. For our interpretation, we relied on two sources: the Longman Dictionary of Scientific Usage (Godman & Payne, 1981b) and the Practical English Usage (Swan, 1996). Both dictionaries provide a useful resource for comparative purposes.

1) To administer and to give

a) (D)… lead was **given** to ewes (S. 26)
a) (R)… lead was **administered** to ewes

b) (D) lead is reduced when **given** together with cadmium (S.41)
b) (R) lead is reduced when **administered** together with cadmium

c) (D) that is why we **gave** …orally for 21 days (S.24)
c) (R) therefore we **administered**…orally for 21 days

d) (D) when Pb and Cd **are given** (S.38)
d) (R) when Pb and Cd **are administered**

As can be observed, the verb 'to give' in the four examples above, is replaced by 'to administer'. Though the words could be used interchangeably in other situations, 'to administer' seems to collocate more appropriately with scientific terminology. In scientific usage, 'to administer' means to give a drug for a known purpose, making sure the quantity is correct, the time interval for giving the drug is correct and making sure that the drug is consumed. However, 'to give' does not carry such distinctiveness.

2) To determine and to measure

a) (D) Lead was **determined** by AAS… (S. 13)
a) (R) Lead was **measured** by AAS…

In what ways do the two lexical items differ? Both frequently occur in scientific usage. Whereas 'to determine' means finding out the value of a property by making a

series of observations; ‘to measure’ implies finding out precisely the value of a property by comparing it with a standard. The authors might be more concerned with the second rather than the first issue.

3) To establish and to set

a) (D) FAO/WHO experts **established** the lead weekly intake tolerable value at…. ….(S.4)
a) (R) FAO/WHO experts **set** the lead weekly intake tolerable value at….

Similarly, the two items exhibit different shades of meaning when scientific values are concerned. While ‘to establish’ suggests making a hypothesis beyond which there is no doubt; ‘to set’ means to fix a value of a variable quantity by changing the value to that which is required for a definite purpose. As shown in the definition, the item ‘value’ collocates with ‘to set ‘, rather than with ‘to establish’.

4) To investigate and to look for

a) (D) The aim of this work is to study …,to **look for** lead metabolism(S.1)
a) (R) The aim of this work was to study…, to **investigate** lead metabolism

Although the two verbs could be considered as equivalent in everyday language, ‘to investigate’ suggests a careful study by means of observations, experimental tests, and deduction from recorded facts, but to ‘look for’ is literally equated to ‘to try to find’ without any reference to the means being used.

5) To derive and to bring from

a) (D) weekly intake **can be brought from** food (S.6)
a) (R) weekly intake **is derived** from food

As in the previous example, ‘to derive’ conveys a more scientific meaning than ‘to bring from’. While, ‘to derive’ implies to obtain A from B by a series of steps;’ ‘to bring from’ does not suggest any experimental evidence.

6) To stay and to remain

a) (D) throughout the treatment, the concentrations in the lead group **stayed** lower (S. 22)

a) (R) throughout the treatment, the concentrations in the lead group **remained** lower

b) (D) after the end of the treatment, they **stay** at a high level (S.51)
b) (R) after the end of the treatment, they **remain** at a high level

'To stay' and 'to remain' both refer to the absence of change, but according to Swan (2000:114), 'to remain' is more formal than to stay. In the examples above, 'to remain' suggests leaving unchanged after the treatment i.e. 'low' in example 22 and 'high' in example 52. The quantitative descriptions, 'low and high', which collocate with the terms, add precision.

7) To produce and to induce

a) (D)…and the possible variations of lead kinetics **produced by** Zn and Cd in order to mimic a very…(S.8)
a) (R)…and the possible changes in of lead kinetics **induced by** Zn and Cd in order to model a very…

'To produce' implies achieving a possible change by a chemical reaction. The process is intentional, but 'to induce' means to obtain an effect in an object or organism in a manner where there is no apparent connection between the agent causing the effect and the object or organism in which the effect is observed. The focus is on the effect obtained.

8) To expose and to treat

a) (D) the ewes were divided in three **exposed** groups (S.11)
a) (R) the ewes were divided in three **treated** groups

To 'expose' is to put an organism in adverse conditions generally; to leave without protection from conditions or circumstances. The focus is on the adverse effect of exposing. But to treat is to use any therapeutic substance or clinical method for a pathological condition, which seems to be the case in the study.

9) To treat and to administer

a) (D) rats **treated** with Pb and Cd in combination (S.43)
a) (R) rats **administered** with Pb and Cd simultaneously

As we explained above, the two concepts cannot be equated. 'To administer' in the example above does not suggest any curative purpose as 'to treat' may suggest.

10) Similar and (the) same

a) (D) **the same** lead concentration was found (S.35)
a) (R) **a similar** lead concentration was found

b) (D) The **same** kind of pattern has been previously related by …(S.30)
b) (R) A **similar** pattern was previously reported…

Despite their similarity, the two adjectives (same and similar) exhibit differences when scientific usage is concerned. We say A is similar to B when both share many characteristics, but each has some discriminating features that make it possible to distinguish between them. But 'the same' suggests there is no differentia.

11) Matter and weight

a) (D) 8.7+ 1.6 mg /kg **dry matter** (S.28)
a) (R) 8.7+ 1.6 mg /kg **dry weight**

b) (D) 0.47 + 0.06mg /kg **fresh matter** (S.29)
b) (R) 0.47 + 0.06mg /kg **fresh weight**

Any object or any material or any organism is composed of matter (that which occupies space and is observable or detectable). The quantity of matter may be measured by its mass, volume, or weight. In the examples above, the concern is weight rather than matter.

12) Simultaneously and in combination

a) (D) rats treated with Pb and Cd **in combination**(S 43)
a) (R**)** rats administered withPb and Cd **simultaneously**

b) (D) as regards, the influence of the other elements , giving lead, Cd and Zn **altogether** (S.44)
b) (R) as regards, the influence of the other elements , on administering lead, Cd and Zn **simultaneously**

'In combination' and 'altogether' suggest that all the individual elements are joined together or act together. The focus is put is put on elements as constituting a whole;

but ‘simultaneously’ describes events taking place at the same time as far as the observer can perceive. Rather than on elements, the focus is put on time.

Reporting verbs in the corpus have also undergone changes, as the examples below show:

13) To notice / to observe/to show and to report / to find

a) (D) Willough **has noticed** (S. 49**)**
a) (R) Willough **has reported**

b) (D) Nilson *observed* that… **(**S.3)
b) (R) Nilson **found/ reported**

c) (D) Pin *et al* have **shown** (S.41)
c) (R) Pin *et al* **found that**

According to Swales (1990:151), the lexical choice of reporting verbs is revealing of the author’s degree of commitment to the cited work. The choice of the verb may suggest that the author is committed to the attendant proposition and therefore, we might expect the cited claim to be strongly substantiated. ‘To report’ and ‘to find’ seem to fall within this category’.

If we now turn to the Globin Gene paper, we notice that lexical revisions follow the same pattern. One lexical item is substituted with another because the alternative seems to be more appropriate and more precise for the scientific context. Once again, this is shown in the examples below:

14) Value and Level

a) (D) ...individuals with elevated Hbf **values** of Hbf (S.75)
a) (R) ...individuals with raised **levels** of Hbf

b) (D) individuals who had the lowest **values** (S.80)
b) (R) individuals who had the lowest **levels**

Though the two concepts carry the idea of measurement, the term ‘value’ has been replaced by the term ‘level’, indicating its inappropriateness for both situations. In fact, ‘value’ is the numerical part of a measurement be it length, quantity, or

magnitude. But ‘level’ suggests a specified stage at which the magnitude of a quantity has a fixed value for a definite purpose or under specified conditions, e.g. if the concentration of blood falls below a certain level, the person becomes unconscious. The use of the adjectives ‘low’ and ‘raised’ make the term ‘level’ more appropriate than the term ‘value’ that calls for a numerical specification.

15) Determination and ratio

a) (D) **The quantitative determination** of the two chains was obtained by... (S.73)
a) (R) **The ratio** of the two chains was estimated by....

Similarly, the terms ‘determination’ and ‘ratio’ seem to convey different denotations. Whereas ‘determination’ suggests the carrying out of an experiment to determine the value of a physical entity; the ratio of two quantities is obtained by performing a calculation (dividing the first quantity by the second quantity and then simplifying the fraction) which seems to be the case in this situation.

16) To obtain and to measure

a) (D) Haematological parameters from blood samples were **obtained by**... (S.72)
a) (R) Haematological parameters from blood samples were **measured with**...

As we have mentioned earlier, the lexical item ‘to obtain’ does not express a precise meaning as far as scientific measurements are concerned. It may just mean to acquire, regardless of the value or the agent used to get the possession. However, ‘to measure’, as explained in example 2, is to find the value of the property by comparing it with a standard. Whereas the agent of use is not necessarily stated with ‘to obtain’, it is essential and purposeful with ‘to measure’.

17) To interfere with and to affect

a) (D) However, we cannot exclude the possibility that the difference in Hbf levels could be due to different base substitutions in the Gg gene which may **interfere with.....** (S.86)

a) (R) However, it is also possible that the difference in Hbf levels result from different base substitutions in the Gg gene which may **affect...**

Both ‘to interfere’ and ‘to affect’ have an effect on the course of a process. In the first instance, the term is assigned a negative value. The process is altered, slowed down, stopped, masked or obscured, e.g. a cell infected by viruses produces a protein which interferes with glycolysis in the cell (the process is slowed down). But ‘to affect’ means to cause a change, e.g. the lack of sunlight affects the growth of a plant. Because the statement is hypothetical, the choice of ‘to affect’ shows a slight commitment as far as the result is concerned.

18) To reveal and to identify

a) (D) sequencing of.....**revealed** a novel substitution (S.79)
a) (R) sequencing of.....**identified** a novel substitution

To ‘reveal’ and to ‘identify’ express two distinct notions. While to‘ reveal’ implies to allow or to cause to be seen, by the removal of a barrier or obstacle, which was previously hidden; to ‘identify’ means to give a name to a piece of matter, a process or a radiation, by comparing it with a like piece of matter, process or… whose properties are known. In this example, a novel substitution is identified by finding its characteristics and so naming it.

20) Variation and Mutation

a) (D) The COT **variation** creates... (S.77)
a) (R) The COT **mutation** creates...

‘Variation’ and ‘mutation’, in the examples above, exhibit great differences. We may even say that ‘variation’ falls within the category of non technical terms; whereas ‘mutation’ is a technical term, the use of which is strictly restricted in science. Variation is commonly defined as a fluctuation above or below an expected value. For example, e.g.the daily variation in temperature can affect the growth of plants. However, ‘mutation’ is a spontaneous change in the DNA of a chromosome;

normally an infrequent event….The occurrence of gene mutation is variable and depends upon the gene which is mutating. The distinction between the two terms is significant and the revision in the context of this paper is important.; the paper discusses the discovery of a novel ‘mutation’.

The corpus under study contains a great number of examples. Sometimes the items are so close in meaning that the many dictionaries we have consulted fail to account for these distinctions. We have worked on those lexical items that lend themselves to interpretations, and we believe quite a lot could be done in the area. As might be observed, the ‘verb’ is the most prevailing part of speech. This category is reported to be important because in many scientific contexts, only one verb is suitable; and the use of an inappropriate verb may result in the construction of an incorrect concept. Godman & Payne (op. cit. p.31.) call attention for such uses:

> When each one of a set of verbs in a lengthy scientific statement is misunderstood, or imperfectly misunderstood, the final elements in the realm of thought produce a vague final proposition. Incorrect or imperfect understanding of the function of the verb in a piece of text… is possibly one of the greatest obstacles to the comprehension of scientific statements

In all examples above, we have tried to show that the substitution of a lexical item by another (by the editorial revisers) indicates that a general language term is inappropriate, but not meaningless; the scientific statements require contextual relevance. The scientific context needs a precise terminology. Although two terms may convey similar meanings in everyday language, only one is suitable in science. To the non-specialist, this does not make any difference; the words could be used interchangeably, but in science writing, a word conveys only the meaning for which it is intended. Scientific writing precludes the use of language that is not precise and

definite, and in science reporting, scientists are expected to use words that denote exactly the meaning of the entity they represent.

Besides precision, clarity is also one of the attributes of scientific writing. Whereas precision requires the substitution of a general item with a more specific one; clarity requires the deletion of any unnecessary item and encourages the economical use of words. Because wordiness obscures the meaning, scientific language precludes the use of writing which is prolix. In this study, we assume that the lexical revisions are also meant to achieve clarity. Complex and elaborate language is expected to give way to short and concise statements.

Analysis of the data (tables 14 and 15) shows that editorial revisers have developed various ways to achieve clarity. For example, when an already stated idea is repeated or when a sentence is wordy, the specialist reviser proceeds as follows:

1) Strikes out redundant items

a) (D) The lead group received a **daily** lead chloride **administration**…2.3 mg/kg/**day** (S.52)
a) (R) The lead group received lead chloride orally at a dose of 2.3 mg/kg/day

2) Deletes unnecessary words or phrases

a) (D) The same **kind of** pattern (S.58)
a) (R) The same pattern

b) (D) This **result** suggests (S.60)
b) (R) This suggests

c) (D) The ratio Vss/Vc was calculated **with the following equation** (S.53)
c) (R) The ratio Vss/Vc was calculated **as follows**

d) (D) The **observed** lead concentrations in the tissues …(S.55)
d) (R) The lead concentrations in the tissues

e) (D) Concerning the lead distribution phase, lead distributes in the **organism of the** lactating ewes (S.56)
e) (R) Concerning the lead distribution phase, lead distributes in the lactating ewes

f) (D) Lead is widely distributed in the tissues i.e. the bones as shown by the concentration **values measured** 81 days after the treatment (S.57)
f) (R) Lead is widely distributed in the tissues i.e. the bones as shown by the concentration 81 days after the treatment

g) (D) The **level of** Z n interference (S.62)
g) (R) The Z n interference

3) Cuts a needless adverb(S.61)

a) (D) there **obviously** seems to be an interaction
a) (R) there seems an interaction

4) **Uses a simpler sentence structure**

a) (D) The differences in HBFH levels **may be explained in part by** the differences in the methodology of quantifying the HBF level (S.85)
a) (R) The differences in the observed HBFH levels **may result from** the differences in the methods of quantification the HBF level

b) (D) However, **we cannot exclude the possibility** that the difference in Hbf levels **could be due to** different base substitutions in the Gg gene which may **interfere with....** (S.86)
b) (R) However, it **is also possible** that the difference in Hbf levels **result from** different base substitutions in the Gg gene which may affect...

c) (D) The detection of..and COT **allows us to conclude** that the HPHF..is.. (S. 83)
c) (R) The detection of ...and COT **shows that** the HPFH...is

5) **Uses a shorter or a straightforward word, phrase or expression**

a) (D) **A number of mutations** have been identified to interfere with.... (S. 84)
a) (R) **Several** mutations have been identified to affect with

b) (D) the ratio was calculated…**from the equation** (S. 53)
b) the ratio was calculated…**as follows**

c) (D) The Reverse Dot Bloss data revealed the **presence of** a mutation (S. 76)
c) (R) The Reverse Dot Bloss showed that **there was** a mutation

d) (D) **according to this sensitivity…**
d) (R) **in response to this……..**

Clarity is also achieved in scientific writing when the coordinate character of elements is highlighted and when the various parts of a paper emerge as ordered units. In the example below, the noun phrase ‘exposure period’ has been used interchangeably with the items: ‘lactating period, ‘treatment’ and ‘exposure’, when

the article writer changed his phrases, he has been reminded to be “consistent” and adopt ‘exposure period’ throughout the research paper, as shown in these examples:

a) (D)…all animals were slaughtered 81 days after the end of the **lactating period**
a) (R) …all animals were slaughtered 81 days after the end of the **exposure period**

b) (D) over the **period of exposure** …
b) (R) over the **exposure period**…

c) (D) throughout **the treatment** …
c) (R) throughout the **exposure period** …

d) (D) after the end of **exposure** …
d) (R) after the end of the **exposure period**…

Lexical changes are an important category in the revision work. Such a finding corroborates with studies by (Ventola and Mauranen, 1991; Dudley Evans,1991; Connor and Mayberry,1996) who investigated the revision processes in research papers and in other research genres. However, none of the previous studies provided an explanation why some items are more preferred than others. In this study; we have made an attempt, showing that the attributes of scientific writing are the guiding principles for such changes. Our assumption is based on the belief that precision and clarity are the norms or the conventions that account for these changes.

6.1.2. Tense Choices:

Tense choices are also an important category in our data. The editors’ view regarding the frequent misuse of tenses in research papers matches the present findings. In both papers (tables 20 and 21), the use of tenses has undergone important changes, and revisions have been concerned with any modification which the verb form has undergone.

Table 20: Suggested Revisions for Tense Choices (Toxicokinetics Paper)

	DRAFT	REVISED VERSION
ABSTRACT	the aim of this work **is** to study…	the aim of this work **was** to study…
	In presence of Cd, the excretion…**had risen**	In presence of Cd, the excretion…**rose**
INTRODUCTION	the transfer of heavy metals from the soil …**is studied**	the transfer of heavy metals from the soil …**has been studied**
MATERIALS AND METHODS	previously, we **had to dilute**	previously, we **diluted**
	where K 10 **was** the elimination rate …	where K 10 **is** the elimination rate …
RESULTS	according to the analysis of variance, there **is** a significant variation	according to the analysis of variance, there **was** a significant variation
	when the animals **are** held as an error term, the difference **is** no more significant between the three treatments	when the animals **were** held as an error term, the difference **was** no more significant between the three treated groups
DISCUSSION	forage hay **contained**…	forage hay **contain**…
	the steady state level **is** dramatically higher	the steady state level **was** dramatically higher
	the blood lead levels **were increasing**	the blood lead levels **increased**
	Lec. (15) **has** also **noticed** this…	Lec. (15) **noticed** this…
	the calculated ratio **reaches**	the calculated ratio **reached**
	these **are presented** from the highest to the lowest…	these **were presented** from the highest to the lowest…
	the same kind of pattern **has been** previously **related** by…	a similar pattern of lead levels in tissues **was reported** by…
	the bioavailability ratio **are** still **detected** in liver…	the bioavailability ratio **were detected** in liver…
	the accumulation process **can be** related to	the accumulation process **might be** related to
	the half time evaluation **is** as long as	the half time evaluation **was** as long as
	similar observations **have been performed**	similar observations **were obtained**
	only 1%…**is excreted**	only 1%…**was excreted**
	when Cd and Pb **are given**	when Cd and Pb **administered**
	P. and K. **have shown**	P. and K. **found**
	Nelson et al. **have observed**	Nelson et al. **reported**

	the milk blood ratio **is** higher reaching	the milk blood ratio **reached**
	Will. **has noticed**	Will. **reported**
	Finally, ZPP **have to be discussed**	Finally, **we discuss** ZPP values
	they stabilize while the blood lead levels **were decreasing**	they stabilize while the blood lead levels **decreased**
	after the end of the treatment , they stay at a high level, while the blood levels **are** always **decreasing**	after the end of the treatment , they stay at a high level, while the blood levels **decreases**
	the means of the hematological parameters **were ranging** within the physiological limit	the means of the haematological parameters **range** within the physiological limit

Table 21: Suggested Revisions for Tense Choices (Globin Gene Paper)

	DRAFT	**REVISED VERSION**
ABSTRACT		
INTRODUCTION	When a β thalassemic gene **is** present …	When a β thalassemia gene **was** present
MATERIALS AND METHODS	Thirty two members of a family…**are** the subjects of…	Thirty two members of a family…**were** studied
	Age of the subjects **ranges** from 9 to 66 years	the subjects **were** aged between 9 and 66
RESULTS	RLFP analysis **shows…**	RLFP analysis **showed**
	C∅T mutation **is** linked …	C∅T mutation **was** linked
	Sequencing of the Gγ…**reveals** …and **cosegregates** with …	Sequencing of the Gγ…revealed …and **cosegregated** with …
	the observed pattern **has been considered**	The observed pattern **is thought**
DISCUSSION	Gγ globin chain **is** observed	Gγ globin chain **was** observed
	HbF levels **could be due**	HbF levels **result from**
	X*mn*I **had been** associated with	X*mn*I **was** associated with
	the HPFHs …**might produce**	the HPFHs …**may have produced**
	HbF levels **are** heterogeneous	HbF levels **were** heterogeneous
	a decrease of α globin chain **may** explain the decrease in HbFlevel as has been noted previously	a decrease of α globin chain **would result in** the decrease in HbF as **reported** previously
	Three sisters… **show** a large variation	Three sisters… **had** large differences

Previous research (Lackstrom, Selinker and Trimble, 1973) has postulated that tense choices in science writing are related to the rhetorical functions of scientific claims. The use of either the present or the past tenses are made on the basis of the notion of "degree of generality".

- If the author wishes to claim no generality for the facts, he will present the information in the past tense.
- if the author wishes to convey generalization about past events, but he doesn't wish to commit himself concerning future events, he will use the present perfect
- If he wishes to make an even more general claim about the information, he may use the present tense.

The authors argue that rhetorical considerations place constraints on the degree of generality expressed at various points in the paragraph and so play a role in the choice of tense. According to Oster (1983:77), the contribution was a "noteworthy ground-breaking attempt to relate rhetorical functions to syntactic choices". It was regarded as an important advance for the understanding of grammar in scientific writing. Elaborating further on the issue, Oster (op. cit.) brought some refinement to these hypotheses, mainly concerning the use of verb tenses in reporting the conclusions of past literature. But the authors' conclusions were considered to be too limited in scope. The choice of tenses in research article writing seems to be determined by other rhetorical principles than the ones outlined above. More recent research (Day, 1995:105-6) has established the link between the scientific norms, the rhetorical structure of the research article and the choice of tenses. He explains:

> When a scientific paper has been validly published in a primary journal, it thereby becomes knowledge. Therefore, whenever you quote previously published work, ethics

> requires you to treat that work with respect. You do this by using the *present* tense…Your own work must be referred to in the *past* tense. Your work is not presumed to be established knowledge until it has been published.

In view of this convention of writing scientific papers, one would expect the revision of tenses to be determined accordingly. Rhetorical as well as scientific considerations would determine the revision of tense in the corpus under study. Moreover, it is reckoned that most revisions would occur in the introduction and discussion sections which necessarily require a shift from past to present tenses.

A thorough examination of the two papers shows a consistent pattern in the use of tenses. The article writers of both papers have moved back and forth between the past and present tenses. Whereas, the materials and methods and the results sections were written in the past tense (In these sections the authors reported on what they did and what they found); Much of the introduction and the discussion sections used the present tense because the authors reported on previous research. We note, however, their use of different tenses in the abstract. Whereas the *Toxicokinetics* paper was fully written in the past, because it reported on present research; the *Globin Gene* paper was mostly written in the present because the abstract restates some definitional concerns. Table 1 shows the tense revisions as they occurred in one of the papers.

As shown in tables 20 and 21, the changes operated on the scientists' drafts are concerned with the verb form (present and past) rather than with its aspect (perfect or progressive). The verbs are revised from present to past in the materials & methods and results sections. In the Discussion section, however, revisions show a combination of forms. Depending on whether the author is referring to his own work

or to others', the tense is chosen accordingly. In the introduction and abstract sections, not many modifications are introduced.

As anticipated, the revisions brought to the form of the verbs are essentially governed by the conventions of scientific writing. The choice of either the present or the past tense is determined by scientific ethics and rhetorical considerations.

6.1.3. Prepositions

Prepositions constitute an important category in our data as regards their frequency of occurrence. They represent (14.5%) of the total revised items. This ranking validates previous findings by Ventola & mauranen (op.cit) and Connor and Mayberry (op.cit.) who found that prepositions constitute a frequent error in non-native writing. In this study, revised prepositions are words or group of words used before a noun to express some relationship with other words in the sentence. Table 22 gives a full account of all revised prepositions in our data.

Table 22: Suggested Revisions for Prepositions (Toxicokinetics Paper)

	DRAFT	**REVISED VERSION**
1	the transfer of lead **in** meat….	the transfer of lead **into** meat….
2	the lead group…received …**over** 52 days	the lead group…received …**for** 52 days
3	the excretion of lead **by** milk	the excretion of lead **in** milk
4	the lead weekly intake tolerable value **to**	the lead weekly intake tolerable value **at**
5	food **from** animal origin	food **of** animal origin
6	**all over** Europe	**throughout** Europe
7	contaminated **by**	contaminated **with**
8	lactating ewes **of about** 2 and 6 years old	lactating ewes **about** 2 and 6 years old
9	**all over** the study	**throughout** the study
10	salts were enclosed **into** a gelatine capsule	salts were enclosed **in** a gelatine capsule
11	blood samples were collected some of them **in** heparinized tubes	blood samples were collected some of them **into** heparinized tubes

12	…**at** day 0,7…	**on** day 0,7…
13	**on total** blood samples	**for all** blood samples
14	**over** the period of exposure	**during** the period of exposure
15	**at** the plateau	**during** the plateau
16	curve profile **of** lead	curve profile **for** lead
17	equivalent **of**	equivalent **to**
18	value is lower than the ones found **in** cattle	value is lower than the ones **for** cattle
19	absorption **for** lead	absorption **of** lead
20	the T1/2β…**in** lactating ewes	the T1/2β…**for** lactating ewes
21	…the one **in** bovines…	…the one **for** bovines…
22	…is ingested **through…within** a week	…is ingested **in the form of… in** one week

This grammatical category is generally regarded as a troublesome area because many prepositions have several but different functions. Also different prepositions may have the same use. This is very misleading to many NNS as their use often results in vocabulary problems. But the complexity is even made worse when science writing is dealt with. Spatial relationship in science requires not only the use of an appropriate preposition to express this relationship, but it also requires more precision than the preposition can provide. This example, from the field of physics, and reported on by Simanek (internet undated document) shows how a concept might be distorted in case an incorrect or inappropriate preposition is used. The incriminated preposition is "of". Some physics textbooks use the term 'acceleration **of** gravity'. That makes no sense because gravity does not accelerate. This term really means 'the acceleration due to gravity', but the use of the prepositions 'of' in this example suggest a different meaning than the common usage. The use of prepositions in science, as in general English, is not determined by any rule. One has to learn the expression as a whole. Nevertheless, we can talk about some preferences in scientific usage as revealed by our study:

1) Throughout instead of all over

a) (D) **all over** Europe… (S.6)
a) (R) **throughout** Europe…

b) (D) **all over** the study….(S.9)
b) (R) **throughout** the study

2) During instead of over
a) (D) **over** the period of exposure (S.14)
a) (R) **during** the period of exposure

3) For instead of over
a) (D) the lead group…received …**over** 52 days (S.2)
a) (R) the lead group…received …**for** 52 days

4) In instead of within
a) (D) …is ingested through**…within** a week (S. 22)
a) (R) … is ingested in the form of**… in** one week

5) About rather than of about
a) Lactating ewes **of about** 2 and 6 years old (S.8)
a) Lactating ewes **about** 2 and 6 years old.

In table 22, we can also notice that some nouns, verbs and adjectives collocate with particular prepositions, which the article writer has used incorrectly.

a) The absorption **of** lead instead of the absorption **for** lead (S.19)
b) contaminated **with** instead of contaminated **by** (S. 7)
c) to set a value **at** instead of to set a value **to** (S.4)
d) equivalent **to** instead of equivalent **of (**S.17)
e) **On** day instead of **at** day (S. 12)
f) Food **of** animal origin instead of food **from** animal origin. (S.5)

All these combinations cause difficulty to many NNS writers because the meaning of a preposition may correspond to a preposition in another language as in most of the examples above. We believe that the misuse in these instances is mainly due to the negative transfer of the French language which influenced the writer of the article. But the most intriguing question is: Why is it more appropriate to to use **into** rather than **in** in some cases but **in** rather than **into** in others?

a) (D) the transfer of lead **in** meat (S.1)
a) (R) the transfer of lead **into** meat

b) (D) salts were enclosed **into** a gelatine capsule (S.10)
b) (R) salts were enclosed **in** a gelatine capsule

6.1.4. Articles

The use of articles in the corpus under study seems to constitute an important category, at least for the *Toxicokinetics* paper. Most revisions are concerned either with the addition or the deletion of an article. The least frequent case is the substitution of a definite article **"the"** for an indefinite one **"a",** or vice versa. Table 23 summarizes the nature of these revisions.

Table23: Suggested Revisions for Articles (Toxicokinetics Paper)

	DRAFT	**REVISED VERSION**
1	**a** lead group received a daily oral lead chloride administration at a ..	**the** lead group received lead chloride orally at a dose of…
2	**a** lead -cadmium zinc group in addition to lead received …	**the** lead -cadmium zinc group… received …
3	**a** lead cadmium zinc group in addition to lead and cadmium …received	**the** lead cadmium zinc group in addition to lead and cadmium …received
4	the transfer of heavy metals from **the** soil to **the** plants	The transfer of heavy metals **Ø** from soil to the plants
5	the lead content of milk was determined on the same day as the sampling	the lead content of **the** milk was determined on the same day as the sampling
6	for milk, operating conditions were drying at 140°C	for milk, **the** operating conditions were drying at 140°C
7	the linearity of calibration curve extended	the linearity of **the** calibration curve extended
8	both lead and cadmium intakes…, whereas zinc intake was high	both lead and cadmium intakes…, whereas t**he** zinc intake was high
9	After the end of exposure, blood lead levels decreased	After the end of exposure, **the** blood lead levels decreased
10	lead concentrations in milk increased rapidly	**the** milk lead concentrations increased rapidly
11	lead concentrations remained low	**the** lead concentrations remained low
12	blood lead concentrations showed	**the** blood lead concentrations showed
13	thus,… were detected in liver and kidneys	thus,… were detected in **the** liver kidneys
14	Indeed, **the** lead contamination of	indeed, **Ø** lead contamination of

	pastures is a reality all over Europe	pastures is a reality all over Europe
15	**…** thus applying **the** pharmacokinetics approach	**…** thus applying **a** pharmacokinetics approach
16	the level of lead…can reach 450 ppm around **a** lead and zinc smelting works	the level of lead…can reach 450 ppm around **Ø** lead and zinc smelting works
17	lead distributes in the organism of lactating ewe rather quickly	lead is distributed in the organism of **the** lactating ewe rather quickly

A thorough examination of the suggested revisions indicates that that the definite article is the most widely revised item although the uses are different from one example to another. In sentences 1, 2, and 3, the definite article **'the'** replaces the indefinite one **'a'**. In sentences 4 and 14, it is deleted. In sentences 5 to 13 and 17, it is added; but in sentence 15 it is replaced by an indefinite. Only sentence 16 provides an example of deleted indefinite article.

In English, the definite article is used to show that a noun or a noun phrase has a unique reference. In such cases, the article may occur with a singular or a plural noun, be it countable or uncountable. Huckin and Olsen's (1981:65) argue "that article choices reflect larger contextual (or even extra textual) considerations. The authors explain the factors that influence article choice in EST discourse. And suggest some uses that were never recorded before. According to the authors, nouns and noun phrases modified by 'the' may be "unique" in several ways. The authors explain:

> In some cases, the referent of the noun or noun phrase is unique by its very nature. We have called this **inherent uniqueness** because the uniqueness exists in the very nature of the referent itself. In other cases, in other cases, the referent of the noun or noun phrase is defined to be unique by a given context. We have called this **contextual uniqueness.** In still other cases, the referent is unique only because this uniqueness is implied. We have called this **implied uniqueness**.

Huckin and Olson continue to argue that inherent uniqueness can be seen when certain adjectives are attached to nouns. These could be superlative adjectives, ordinal

adjectives as well as other adjectives, which by their very nature restrict nouns to a unique referent, such as *only, present, current etc*. Inherent uniqueness can also be seen with certain nouns that refer to unique events, for example, *the past* or *the fuutre.* Nouns that refer to a general class-type are also modified by the definite article. In contrast with these cases, the authors propose some instances of unique reference whereby the context determines the uses: the contextual Uniqueness. These instances are *previous mention*, *shared knowledge* and a *defining modifier*. Whereas previous mention occurs in the form of a repeated noun, shared knowledge assumes a common background because both the reader and writer belong to the same culture. The defining modifier is an appended phrase that describes a unique reference. The last category of unique reference, typified by the authors, is the instance of implied uniqueness. This occurs when a writer wants to imply that a noun or a noun phrase has a unique referent even though the reader doesn't share this knowledge. According to the authors this type is not often used by EST writers.

If we examine our data, we notice that the overwhelming use of the definite article is determined by the contextual uniqueness.

a) (D) **a** lead group received a daily oral lead chloride administration at a .. (S.1)
a) (R) **the** lead group received lead chloride orally at a dose of…

b) (D) **a** lead -cadmium zinc group in addition to lead received … (S.2)
b) (R) **the** lead -cadmium zinc group… received

c) (D) **a** lead cadmium zinc group in addition to lead and cadmium…received (S3)
c) (R) **the** lead cadmium zinc group in addition to lead and cadmium …received

In these examples, the specialist reviser assumes that the reader shares knowledge because of previous mention. Indeed, when we look at a wider context, we find that the modified noun 'group' has already been mentioned in the previous

sentence, and as can be found in the original paragraph (See appendix F, the abstract section)

> **Four *groups,*** a control group of four animals and three groups of five animals were used: **The** lead group received lead chloride orally at a dose of … throughout a 52-d lactation period; **the** lead-cadmium group…..received cadmium…… and 1.25 mg……..**The** cadmium-zinc group…received zinc oxide orally at a dose…..

Similar cases are found in other examples. However, example 7 shows an instance of shared knowledge.

a) (D) the linearity of calibration curve extended (S.7)
a) (R) the linearity of **the** calibration curve extended

Despite the fact that 'the calibration curve' is the first mention of the noun in the article, it is assumed to be known by the reader. The shared scientific background of both reader and writer helps define the noun. Isn't the writer addressing an audience with a common specialized culture?

6.1.5. Spelling

Errors tabulated in 24 below, show that revised items range from misspelled words to ill formed adjectives.

Table 24: Suggested Revisions for Spelling (Toxicokinetics Paper)

	DRAFT	REVISED VERSION
1	deshydrated	dehydrated
2	phophore	phosphorus
3	slaugthered	slaughtered
4	analysed	analyzed
5	exponentiel	exponential
6	bicompartimental	bicompartmental
7	peripherical	peripheral
8	bodyweight	body weight
9	theoritical	theoretical
10	administred	administered
11	nutriment	nutrient
12	recurent	recurrent-
13	osteolysis	osteolytic

Spelling errors as (theoritical, administred, and recurent) are frequently encountered mistakes independently of whether the author is a science or a general writer. These often result from the influence of the author's primary language of communication, particularly when the word is a cognate in French as 'exponentiel', 'deshydrated', or 'bicompartimental'. At other times, this is due to the authors' ignorance of the journal conventions. When an author is submitting his paper to a British or an American journal, words should be spelt accordingly, for example the item 'analysed' is written in the British way; consequently, the reviser corrects it according to the conventions of the journal. But ill formed adjectives as peripherical and osteolysis denote the scientist's weaknesses in dealing with bound and affixed morphemes in science.

6.1.6. Noun Phrases

These are long nominal constructions that are often used to replace relative clauses. Compound-noun phrases have developed greatly in scientific English in response to the need for a shortened, concise, and condensed form which is said to have greater impact upon the reader. They are said to "shorten the message without obscuring the clarity of the meaning and are therefore very convenient" (Bartolic, 1979:275). But when a cluster of nouns are used as adjectives, this often results in a wrong ordering of words. When more than two modifiers are used with a headnoun, unskilled writers may alter the order of nouns and obscure the meaning of the message. Table 25 shows the examples, encountered in our data.

Table 25: Suggested Revisions for Noun Phrases (Toxicokinetics Paper)

	DRAFT	REVISED VERSION
1	…**the average level of lead in blood** at the plateau phase	**the mean blood lead concentrations** during the plateau
2	**In milk, the concentration of lead** was rather high	**the milk lead concentration** was rather high
3	**the milk blood ratio of concentration** is also higher	**the milk to blood lead concentration** is also higher
4	**protoporphyrin zinc concentration**	**zinc protoporphyrin concentration**
5	we measured the lead concentrations with a **spectrophotometer 1100 B Perkin Elmer** …	we measured the lead concentrations with a 1100 B **Perkin Elmer spectrophotometer …**
6	…**the Cd blood concentration**	**the blood Cd concentration**

The length of these compound-nouns ranges from a two-noun structure (S. 4, 5, and 6) to a three-noun compound (S.1, 2 and 3). As can be observed, the article writer has misplaced some of the modifiers and added some prepositions, resulting in a blurred meaning and wordy sentences. As a rule, the direction of interpretation always starts from the headnoun and proceeds sequentially to the left.

6.1.7. Connectors

These are link words and conjunctions which a writer uses in order to hang together the different parts of a text and to show the logical relationship that ties them up. Suggested revisions for connectives are rather limited in our study. These represent only1.8% of all total revisions. In other words, these account for three instances that we have illustrated in table26.

Table 26: Suggested Revisions for Connectors (Toxicokinetics Paper)

	DRAFT	REVISED VERSION
1	**As** lead is separated from…..	**since** lead is separated from
2	After a previous study …, we now consider the transfer of lead …, **thus** applying	After a previous study …, we now consider the transfer of lead …,
3	**that is why ,**we gave	**therefore,** we administered..

This finding corroborates with Ventola and Mauranen's (op. cit. p.464) who also found that NNS writers use connectors "relatively infrequently". This low frequency of occurrence in the corpus may also suggest that sentence connecting items are inherent to the narrative discourse rather than to the scientific one. The logic that governs the order of topics in scientific English is not supported by linguistic elements but rather by other features such as the non verbal material. Nonetheless, the suggested revisions in our study (table 26) seem to raise questions. If *therefore* is preferred in usage to *that is why* because the chosen connector is brief and straightforward, Why is *since* better than *as*?

6.1.8. Sentence Structure

Poor sentence construction is often incriminated in evaluating the NNS' writing. The annotated comments on the scientists' drafts witness on this situation. But this fault does not find support in the present data. The very few instances in the corpus concern a single instance of passive versus active sentence construction and some cases of a displacement of adverbials position.

Despite the extensive revision work which the *Toxicokinetics* paper has undergone, we found only one correction of sentence structure. More specifically, there is only one transformation from a passive to an active construction, as shown in thee example below.

a) (D) Zpp values **have to be discussed**
a) (R) We **discuss** Zpp values.

It is commonly believed that one of the conventions of science writing is the use the passive structure. In doing so, scientists achieve objectivity in writing. They pull the focus from the researcher (subject) to put it on the research itself (object). This stylistic convention results from the fact that the passive structure expresses

neutrality and is less personal than the active one. Yet, this view doesn't seem to be persuading for science writers any more. Very often the passive structure runs counter the sentence clarity and thus results in an awkward and unclear meaning. Now, many style guides recommend the use of the active voice as it is shown in the quote below:

> I herewith ask all young scientists to renounce the false modesty of previous generations of scientists. Do not be afraid to name the agent of the action in a sentence, even when it is "I" or "we". Day (op.cit:106)

The revision of the passive construction in the previous example finds justification in the quote above. Because the passive infinitive construction shows a high level of depersonalisation, the sentence structure was turned into an active form where the agent became known. However, our analysis of the second paper (the *Globin Gene*) did not show any revision related to the passive /active construction. Nevertheless, our attention was drawn by these recurrent changes occurring at the sentence level (table 27).

Table 27: Suggested Revisions for Sentence Structure (Globin Gene Paper)

	DRAFT	**REVISED VERSION**
1	**In our Algerian HPFH case,** this site was absent on both chromosomes	This site was absent on both chromosomes **in our Algerian HPFH case**
2	**During the perinatal period** a switch in t the pattern of hemoglobin synthesis occurs....	A switch in the pattern of haemoglobin synthesis occurs **during the perinatal period**....
3	**To define the β globin cluster haplotype**, ten RFLP were investigated....	Ten RFLP were investigated **to define the β globin cluster haplotype.....**
4	**In the A y promoter** no DNA sequence variation was observed...	No DNA sequence variation was observed **in the A y promoter...**
5	**For the Gγ promoter region,** a 753bp fragment was amplified....	A 753bp fragment was amplified **for the Gγ promoter region**

In general English, it is known that adverbials can go at any position in a sentence: initial, medial and end positions. In these examples all adverbials have been placed by the article's author at the opening position. As it can be noticed, the specialist reviser has changed their position at the end of the sentence. There seems to be some reason for such a shift. We believe that this displacement might be determined by the importance of the information contained in the sentence. The most important information might have been put purposefully at the end of the sentence to get greater emphasis; while less important information is put in the beginning. Would the principle of “end-focus” be another convention in scientific discourse?

Textual analysis revealed that revisions, both at the lexical and at the grammatical levels seem to be guided by scientific considerations. The linguistic revision process for science writing is not yet fully researched; further investigations are needed to claim its socially constructed grounding. Future research will have to verify this. In the following section, we propose to analyze the rhetorical organization of the two studied research papers.

6.2. Rhetorical Analysis

The rhetorical structure is the functional division of a text in terms of sections that carry out certain communicative purposes. Research in the area, as we reported in (section 3.3.4.) has shown that scientific research papers introduction exhibit a common rhetorical pattern. They form a recognizable genre that fulfils a common purpose. The CARS model (section 4.4.3.) is an illustration of such a patterning. In our study, none of the papers has undergone any revision in its structure. However, our purpose, in this section, is to investigate whether the introductions written by the subjects of our two case studies fit within the conventional pattern.

Applied to the introduction of the *ToxicoKinetics* of Lead paper, the three move- pattern proposed by Swales does not fit properly. The moves do not follow closely the move-step sequences as they appear in the model. The article introduction structure would result in a two move-pattern, essentially constituted of steps 1 and 2 from move 1. Because the introduction of the article under study falls within the short type pattern (eight- sentence long and 244 words), the 1981 model, or the four-move pattern (section 6.3.2.) seems to fit better. Rather than an optional step in move 1, *the summarizing of previous research constitutes* an essential but distinct move 2 (table 28)

Table 28: The Move-Step Analysis (Toxicokinetics Paper)

Move 1: Establishing the field	**(S1)**Lead toxicity has been reported to be related to impairments of children's mental development and learning capacity, and in response to this, in 1987, FAO/WHO experts set the lead weekly intake tolerable (WIT) value at25 µg/ week / kg body weight (1).	Step2 :stating current knowledge of the topic
ove 2: Summarizing for previous research	(**S2**) Part of the weekly lead intake in many cases is derived from food of animal origin. (**S3)**Indeed, lead contamination of pastures is a reality throughout Europe and food of ruminant origin can be a source of dietary lead **(**2**)**. (**S.4)**Since lead is liberated from local or distant industrial sites as well as from petrol, the entire food chain can be considered to be contaminated with lead or with lead (Pb) together with Zn and Cadmium (Cd) as it is in mining areas **(3).**	
Move 3: preparing for present research	(**S.5**)The transfer of heavy metals from soil to the plants has been studied by researchers working in agricultural fields **(**4**).**	Step3 extending a finding
Move 4: presenting present research	(**S.6**)As veterinarians, we aim to study the transfer of lead into milk, the main source of contaminants for children. (**S.7**)After a previous study of lead	Step1 stating the purpose Step 2 describing

	contamination of cows' milk (5), we now consider the transfer of Pb into ewe's milk, applying a pharmacokinetics approach, and the possible changes in lead kinetics induced by Zn and Cd in order to model a very likely ground situation and to suggest agricultural or animal feeding techniques.	briefly present research
Unlabelled move	**(S.8)**The transfer of Cd to ewe products was studied at the same time and will be the topic of another report.	

The rhetorical analysis of the global coherence according to this model shows that:

Move 1: *Establishing the field* is expressed in a single sentence paragraph. **(S.1)**

Move2: *Summarizing Previous Research* is summarized in (**S.2**and **3**),

Move 3: *Preparing for present research* is shown in sentence (**S.4)**

Move 4: *Presenting present research* is summarized in two sentences (**S.6** and **7**)

We note, however, that the closing sentence (S.8) doesn't fit anywhere in the move-pattern model. The sentence announces future studies. Though this rhetorical move is quite uncommon in the corpus studied by Swales and other researchers, it is quite frequent in similar articles as the one under study.

The study reveals that the present introduction is structured in its simplest form. Each of the moves uses no more than one of the suggested steps. Though very important (because it shows the significance of the research), *centrality of the topic* step is not directly stated. By raising a sensitive topic (correlation between children's mental health and lead contaminated dairy products), the authors might indirectly imply that the topic is indisputably worth investigating. Rather, the introduction opens by *making a topic generalization* (**S.1**), representing a "neutral statement" (Swales, 1990: 146) which the authors have linguistically expressed through a

passive infinitive construction. (Lead toxicity **has been reported to be related** to…). To show the topic significance, the authors have also called for a well established body of research (a group of FAO and WHO scholars) already active in the area, suggesting that the research topic is an already established one.

Reviewing previous literature **(S.2, 3, and 4**) is a central move in the introduction. Each of the reviewed works supports the introductory *generalization* in some way. Besides the building of the present work on the previous ones, the role of citation here is multifarious. It could be showing knowledge of the field, giving due credit to authors, marking a stance towards findings… the citation format is consistent throughout. Citations occur at the end of each sentence, using parenthetical, numerical script.

Neither *indicating a gap* nor *raising a question*, the authors have rather chosen to *extend findings* (**S.5)**. The reference directly relates what has been found (lead contamination in agriculture) to what the authors propose to continue to do. Though Swales (op.cit.) believes that this represents a "flat type" of introduction, whereby the authors miss the opportunity to highlight a gap. We might also view it as a safe way for the authors to show their commitment to continue a research tradition instead of to challenging an established practice.

In the last move, the authors both *state the purpose* of their research **(S6**) and *describe it briefly* (**S.7**), In this last step, the authors restate ,narrow down the focus, determine the method and throw light on expected findings.

If we examine the rhetorical structure of the *Globin Gene* article (table 29), We can make similar observations.

Table 29: The Move-Step Analysis (Globin Gene Paper)

Move 1: Establishing the field	**(S.1)**Faetal Haemoglobin (Hbf) is the major form of haemoglobin(Hb) present during faetal stage of development. **(S.2)** A switch in the pattern of haemoglobin synthesis occurs during the perinatal… **(S.3)** By the end of the first year of life….	Step 1: claiming centrality and Step2 :stating current knowledge of the topic
Move 2: Summarizing for previous research	**(S.4)**The sustained expression of one or both of the foetal globin genes (Aγ and Gγ) in adults is characteristics of a group of genetically heterogeneous conditions called hereditary persistence of foetal haemoglobin (HPFG)…(**S.8**)The HPFH results from either large deletions in the β globin gene cluster or point mutations in the distal (Collins et al.1984; Costa et al. 1990; Giglioni et al. 1984;……) promoter regions of one of the two γ-globin genes	
Move 3: preparing for present research	**(S.9)** Recently, a single base insertion in the distal promoter region of gγ has been reported to produce an HPFH phenothpe (pissard et al.1996)	Step3 extending a finding
Move 4: presenting present research	**(S10)** In this study, we report HPFH in an Algerian family where a modest increase in Hbf…….promoter. **(S.11)**Hbf levels were seven times higher when a βthalassaemia gene was present in addition…..	Step1 stating the purpose Step 2 describing briefly present research

The analysis of the global organisation shows that:

Move 1: *Establishing the field*: is expressed in three sentences that make up paragraph one (**S. 1, 2, and 3**)

Move2: *Summarizing Previous Research* is summarized in 5 sentences (**S.4, 5, 6, 7, and 8**).

Move 3: *Preparing for present research* is shown in sentence (**S.9),** closing the literature paragraph.

Move 4: *Presenting present research* is summarized in the two last sentences (**S.10** and **11**)

The analysis reveals that the *Globin Gene* introduction is also organised in the conventional rhetorical pattern. Each of the eleven sentences that make up the article finds a niche in the Swalesian model. But unlike the previous article, the first move of the introduction opens the paragraph showing the *centrality of the topic.* This step is directly stated, and the use of the adjective 'major' justifies how central the research is.

Reviewing previous literature: is also an important move in the introduction. This is expressed through the many cited works; the article writer has referred to in order to construct his own argument. The citation format is consistent throughout, and all citations intersperse the reported on information.

Like, the *Toxicokinetics* author, the *Globin Gene* writer has skipped the *indicating a gap* and *raising a question* steps, He has rather chosen to *extend findings*. The adverb 'recently' creates the link between the previously cited work and the present one. In the last move, the authors both *state the purpose* of their research **(S6**) and *describe it briefly* (S.7). At this stage, the authors restate, narrow down the focus, throwing light on their findings.

As far as the editorial revision is concerned, the papers have not undergone any rhetorical changes. The authors' initial organization perfectly matches the Swales model which explains why the rhetorical structure of the *Toxicokinetic**s*** and the *Globin Gene* papers introductions have remained still.

Conclusion

In this chapter we discussed our main findings as regards the textual features which typify the revisions that the two case study subjects' papers have undergone. The linguistic analysis has revealed that scientific discourse is governed by rules which differ from the rules of general usage. The linguistic changes should not be regarded as mere corrections for some lexical or syntactic fault; rather, these are motivated by the ethos and the conventions of the scientific field. On the other hand, the rhetorical analysis has shown that the two papers are organized according to the scientific conventions, and this explains why no revisions are operated on this level. These findings, once again, confirm our Hypothesis that the revision of manuscripts is a process that is meant to refine the authors' writing according to scientific standards. This textual analysis has helped us gain insights concerning the linguistic issue in science writing; we propose to discuss the implications in the following section.

GENERAL CONCLUSION

1. Summary and Conclusions

Interest in this research arouse out of an effort to understand the role of English in a community life of scientists. English, as an instrumental tool, was found to serve different purposes. Scientists use the language to read scientific literature, to communicate with foreign peers, to take part in international meetings; but essentially, the language was used to translate research findings into published material to be read by the wider research community.

This need, however, requires more than a slight acquaintance with the language. The language in which scientists write and the quality of reporting are as important as the scientific craft itself. If the scientific craft calls for original findings, sound experimental design, and relevant theoretical backup; the language in which research findings are reported calls for a highly skilled expertise: This requires knowledge of the language, qua code control; and knowledge of the language as a vehicle of scientific thought.

The use of English in international communication is hypothesized to be one of the most troublesome areas for Algerian scientists. A great number of them must be victims of their language inadequacy and the questions that this research sought to answer were:

4. How do Algerian scientists write and publish in Anglophone journals?
5. How important is the language variable in the evaluation of submitted manuscripts?
6. What linguistic changes do editorial revisions bring onto accepted papers?

This study has attempted to provide explanation by investigating the writing /publishing processes of scientists, their written products and their audience feedback. The conclusions we have reached could be summarized as follows:

1.1. The Algerian Scientists' Writing Processes in Anglophone Journals

Algerian scientists have developed a range of strategies to overcome both the linguistic and the editorial hurdles. Using 'ingenious' writing strategies, they manage to get by and have their papers written in English. Relying on 'the old boy network', they successfully secure themselves from the exclusion threat imposed on them by journal gate keepers.

Their writing process consists of strategies that tend to reproduce chunks of previous rhetorical models. The written product is therefore a 'clone' article that requires some language polishing to give it persona and voice. This is achieved through social interaction which home scientists have developed with other members of the research network, changing the 'alleged' individual writing act into a team effort, a collaborative and social enterprise whereby each scientist performs a particular task.

To overcome the editorial bias against submissions produced in the developing world, Algerian scientists' strategies consist of pairing up with well established scientists in the developed countries, and working under the patronage of a well known figure in the field. Both his name and his address on the co-authors list are necessary devices to make the publication process possible. These 'acquaintances' are not only necessary for the socialization apprenticeship, but they also act as a prerequisite for the acquisition of membership in the worldwide research network.

But if these strategies seem to have worked for them so far, in the long run, they might not be effective. The manner in which research articles are written lacks expertise and professionalism. And neither amateurish translation nor the unprofessional language teachers' assistance can provide an adequate remedy.

The ultimate solution lies in the acquisition of an English proficiency both at the linguistic and the discoursal levels. English language learning for scientists should not be regarded as a mere university course requirement at the post-graduate level, but it should be considered as an essential constituent of the research environment. English proficiency should be regarded as a compulsory working tool for research and development. Scientists need permanent and specialized language servicing units that cater for their everlasting needs.

1.2. The Language Variable in the Evaluation of Submitted Manuscripts for Publication

The language variable in the evaluation of manuscripts is an insidious criterion. Though it is never explicitly stated as a normative criterion, poor and insufficient language proficiency often acts as a primary reason for rejecting manuscripts. As a result, scientists are prevented from getting published in prestigious journals, and their contributions often end up by landing in lower ranked journal. Editors, in this study clearly stated that they rejected papers that did not meet the quality standards. The poor quality of reporting masks the significance of research findings.

However, the scientists' views in this study seem to be unshared. Whereas some believe that the language problem does not prevent them from publication; others regard language as a real impediment in their work. Scientists, with foreign links abroad, are privileged. They seem to view the language problem as a minor issue as compared to other research components. So far, they have been relying on

their ‘circle of acquaintances’, who have made the writing and translation task easier for them. But scientists off network or those who seek for self-reliance often regard the language problem as a hindrance in the furtherance of their aim. These have often been faced with rejection on linguistic grounds as data in this study have amply evidenced. Proficiency in English is certainly the ‘not mentioned’ but essential requirement that the editorial board members rely on to make decision for rejecting or getting the paper into print. Proficiency in written scientific discourse is what the community expects NNS contributors to achieve to become accepted members of the research community.

1.3. What Linguistic Revisions for Science Writing?

The textual analysis, in this study, is revealing of both the scientific community expectations and the common pitfalls which science writers must avoid. It has primarily shown that the editorial revision process is meant to purge the language that is not consistent with the norms of scientific discourse. As we have anticipated, both the linguistic and syntactic revisions of scientific papers are determined by scientific and ethical considerations rather than by any rules of general usage. Woolly and wordy language is replaced by clear and direct statements. Complex words give way to simple and precise ones. Tense usage places the researcher’s work in the scientific community scale and article usage addresses an audience with a shared scientific knowledge.

Our findings as far as the textual analysis is concerned have contributed to support the assumption that the revising of scientific papers is a socially constructed process. They are determined by the knowledge, beliefs and experiences grounded in the scientific community. These findings defy the ‘good old day’s grammar’, which

used to make the pride of language teachers. Unless new roles are defined, the language teacher's help is turned into a trivial role which should be left to more qualified teams.

Though restricted in scope, this study primarily shows the importance of studying writing from a social context perspective. This perspective allowed us to demystify roles, to uncover reality, and to unveil the hidden facts of the scientific practice. Despite their limitations, the data were informative; sometimes challenging but merely interesting for us. The areas for discussion are plentiful. These suggest some implications for those who do research on writing, those who teach writing in the disciplines, and those who write in the disciplines. Because there are gaps which we have been unable to fill in, some suggestions for future research are made.

2. Pedagogical Implications

One of the important questions that this study raises is the role of language teaching in disciplinary classes and the type of language assistance that research writers need. Do ESP classes cater for real needs, or do they just have a perfunctory role? If the English language is essential for the scientist's survival, what should language assistance provide science learners and professionals with? Doesn't our conclusion suggest that our teaching is totally obsolete and outdated? And isn't it high time for us to revisit our notion of teaching specialized languages and adjust our methodologies accordingly?

Both the language assistance and the language classes we are providing science learners and researchers with are far from catering for the scientists narrowly focused needs. The evidence presented in this study suggests that there is a total inadequacy

between the services a language teacher is offering and the demands a scientist is requesting. Neither the knowledge language teachers are equipped with, nor the teaching they propose can help the future science writer achieve the publishing task. In a word, the services are inefficient and inappropriate and the needs call for an expertise that goes beyond the language teachers' present competence. Perhaps the language teachers' role would be more appreciated if we turned towards the search for new professionally oriented methodologies. Four possibilities are likely to remedy this situation:

2.1. Developing an Interdisciplinary Collaboration

Interdisciplinary collaboration is a team effort which will bring together the scientific expertise of scientists and the linguistic competence of language teachers. The aim would be to analyze discourse and to uncover the implicit rules that govern its use. Textual analysis *in vivo* and observations *in situ* are means through which these conventions can be made explicit.

So far, the type of collaborative work that has tied the scientists to language teachers has focused on editing language errors. There should be less concern with these matters, as these rarely constitute a real help. It is time for language teachers to shift attention to more complex matters of science writing and to develop an interdisciplinary research into scientific discourse. This research collaboration should aim at understanding why linguistic, mainly lexical and syntactic, changes are operated on revised articles and how these are related to the context in which scientists live and work. It should also be concerned with identifying the characteristics that typify the various scientific genres.

2.2. Rethinking the Role of Language Teaching in the Disciplinary Class

Closest to this recommendation are Roe's repeated calls for revisiting the notion of language teaching/learning in professional and academic settings. Roe (1997/1) argues that traditional methodologies are no longer suitable to the newly demands, and he suggests that the needs of both worlds should be refocused. His critical observations are summed up in the following quote:

> The 'long-haul' approach of having to 'learn the language' before one can use it for practical purposes is no longer an economic proposition, and increasingly there are calls for 'just in time' communicative abilities, for increasingly narrower contexts and purposes.

What is meant here is that language teaching today should be adapted to the new situation. Unlike traditional approaches, which the author regards as “impracticable” and “unaffordable”, language teaching today must be both “cost and goal effective”. The objectives should be determined by the immediate purpose of the users. In addition to their high cost, traditional approaches fail to train professionals in the ‘discourse’ they need. Learners are crammed with a bulk of linguistic knowledge that they don't necessarily need to fulfil their specific purpose. Moreover, the standardisation of language courses fails to account for the specific community needs; rather it deprives discourse from its idiosyncratic nature.

What is suggested then is that the language teachers’ role should be revisited. Teachers can no longer act as dispensers of knowledge nor can they claim command over the target discourse. They should change their teaching roles and act as discourse analysts. These new roles make them recover their ‘lost authority’ and make the learning process as efficient as possible.

We believe that these new roles, which absolutely match our image of the disciplinary language teacher, free education from the confines of the traditional

classroom instruction whereby the teacher's unique source of reference is grammar. Science writers need an approach that provides them with efficient learning strategies, which help them access and explore the target community discourse and encourage their autonomous and active learning.

2.3. Developing Research Writing Courses for Science Students

Teaching the research paper has never been a tempting activity in our classes. Such a teaching is thought to go beyond many English teachers' ability. The fear is real. However, now that published material is available (e.g. Swales and Feak, 1994), language teachers need to integrate the research paper in their activities. Such courses should introduce learners to the principles of scientific work; train them to present, to organize, and to analyze data. In a word, these should equip them with a linguistic and organizational competence that helps them write a scientific manuscript in an expert and authoritative way. Approaching the research paper will certainly be more motivating and more useful for post-graduate science learners than any other material that doesn't take into account their real needs.

2.4. Initiating University Language Learners to the Language of Science and Technology

One of the innovative changes brought recently by the new reform in the higher educational system (the Licence, Master and Doctorate system) has been the introduction of the EST/ESP component, as part of the applied Linguistic studies programme. This is a fundamental and compulsory unit in the course, beginning right from the first year. The global aim is clearly to initiate language learners to the linguistic varieties that specialists both in academic and non-academic settings use in

their professions. Students in these courses are expected to be made aware of how language changes according to the context where it is used, and how text types vary according to their communicative purposes. These courses, unfortunately, often mirror our incapacity to equip our learners with a solid grounding in the subject matter. Because the personnel in charge of these units is often unskilled and outsider to the task, the teaching is often emptied of the intended purposes, resulting in a mere study of content specific texts where explanation of words, functioning of phrases and sentences are the governing mode of teaching. We believe efficiency could be achieved if these classes are made forums of discussions where authentic samples of texts that professionals use are studied; where the universe of implicit and explicit conventions that govern scientific and technical texts are debated; where linguistic features that characterize texts are analyzed, where reader/writer intentions are discussed… These ESP/EST classes should not be places where learners just lift meaning off the texts; rather, these should be contexts where students are immersed in real language uses and provided with a genuine preparation for their future academic and occupational challenges.

Developing interdisciplinary research, rethinking the role of language teaching in science, diagnosing and treating the trouble areas of scientists, devising a proficient approach for assisting researchers write effectively… all seem possible solutions to generate a dynamic participation of the scientist in the international community, but our concern is also to preserve the language teacher's “raison d’être”. Unless effective solutions are found, the language teacher’s role, in the near future, will be unnecessary and likely to be forever uncalled for.

3. Suggestions for Further Research

The study offers various topics for both textual analysis and qualitative investigation. The most urgent is the need to replicate this study in different disciplinary contexts so that the present results could be generalised and the pedagogical implications could be implemented. Then, we propose that related areas would be explored to provide a wider perspective and add further ingredients to the discussion on research writing. We propose the following areas of investigation:

3.1. The writing process

The writing process as modelled by this study and evidenced by previous research is a "social activity". Science writers canvas, design, solve their research problems with other members of the community. They also write their articles collaboratively. Co-authors engage in a process where each scientist's role consists of fulfilling a given task. However, the way we teach writing to our students is completely different from what is happening in the scientific community. In order to play a more effective role as future disciplinary teachers, there is a need to understand how skilled scientists perform their writing tasks. Future research should examine the areas of differences that oppose general writing classes to the writing that scientists do as part of their work.

3.2. Genre analysis

Like journal publication, the conference is also one of the major channels of scientific communication. Scientists attend conferences very often. They listen to their peers' research findings and present theirs. One interesting thing we came up with in this study is that conferences and seminars constitute a cornerstone for

generating research ideas and integrating research networks. The questions that one might ask are: what language skills do scientists need to communicate efficiently in these scientific forums? What practices do they develop when they attend conferences? And how do conferences prepare successful publications?

3.3. The citation process

So far, we have explained that research papers are assessed mainly by peer reviewers and the editorial staff members. However, researchers in the sociology of science argue that a research paper is accepted by the scientific community only when other papers, which use its findings as evidence to support further claims, have cited it. A fruitful area of investigation would be to explore the citation process and how scientists build on each other‘s work. It would be interesting to explore how scientists knit their own work with previous research and to analyze the role of citation in the research papers. Does citation have a challenging or confirmative function? Does it have an organic importance or just a cosmetic value in the text?

3.4. Audience expectations

Millions of papers are published in millions of journals. With such a tremendous number, we expect periodicals to have heterogeneous standards. Clearly, there are top class international journals such as *Nature* or *Science* which publish real value contributions and breakthrough research papers. At the other extreme, there are journals that publish almost any paper to fill in pages. An interesting question would be what type of journals do non-native speakers publish in? Or rather, what type of journals do they have access to? Would the linguistic and discourse scrutiny be less rigorous? What would the audience expectations be like?

In this study, we have considered the publishing problem as a basically linguistic issue for which we tried to provide a pedagogical solution. We regarded the language barrier as the source of impediment, preventing the scientists from access to the research world. Our response has been an educational contribution. We suggested that language teachers should develop more appropriate teaching methodologies, that researchers should investigate the writing practices, that discourse analysts should examine the linguistic characteristics of the scientific genre…This, however, might be a narrow angled or professionally biased view. There are other facets to the problem, which this study has not tackled in spite of their importance. Publishing in the Algerian context, according to the scientists themselves, is mainly a provision of research facilities. It is an issue that can be valued or downplayed depending on the research facilities and funds the researchers are awarded. The more encouraging political and economic policies towards science, the more proficient researchers are. But the researcher's space in the Algerian system is so tiny; the facilities are so deficient, that the consequences resulting from this situation are tremendous. A great number of scientists continue to migrate to developed countries, seeking for better job opportunities and more suitable working conditions. If we want them to keep pace with their peers in the rest of the world, Algerian scientists need funding and resources. If we want them to compete on an equal basis with other researchers, scientists should have access to the same opportunities.

List of References

Ammon, U.
2001---------- English as a future language of teaching at German universities? A question of difficult consequences, posed by the decline of German as a language of science. In Ammon; U. (ed.). *The Dominance of English as a Language of Science: effects on other languages*. Berlin: Walter de Gruyter: 330-343

Allen, J.P.B and H.G Widdowson
1978----------Teaching the communicative use of English. In Mackay, R and A. Mountford (eds.). *English For Specific Purposes*: A case study approach. London. Longman:56-77

Andersen, R.
1985----------Overwriting and other techniques for success with academic articles. In P. Robison (ed).Process and product *ELT Documents* Vol.129:151-159

Anderson, J.D.
1974----------Foreign language barriers in information transfer. *Journal of Education for Librarianship*. Vol. 14:171-184

Baldauf, R. B and B.H Jernudd
(1983a---------- Language of publications as a variable in scientific communication. *Australian Review of Applied Linguistics.* Vol/6:97-108

1983b----------Language use patterns in the fisheries periodical literature. *Scientometrics.* Vol.: 5/4:245-255

Baldauf, R. B.
1986----------Linguistic constraints on participation in psychology. *American Psychologist.*Vol. 41:220-223

Bander, R.G.
1978---------- *American English Rhetoric: A Two- Track Writing Program for Intermediate and Advanced Students of English as a Second Language.* New York. Holt, Rinehart and Winston.

Barber, C.L.
1962 ---------- Some measurable characteristics of modern scientific prose. In J.M Swales (ed.) *Episodes in ESP: A reader on historical principles*. Birmingham; UK: The University of Aston, LSU.

Bartolic,L.
1979----------Nominal Compounds in technical English. In M.T Trimble, L.Trimble, and K. Drobnic (eds.) *English for Specific Purposes: Science and Technology.* Oregon State University, ELI.

Bazerman and J. Paradis (eds).
1991----------*Textual Dynamics of the Professions: Historical and Contemporary Studies of Writing in Professional Communities*. Madison, WI: The University of Wisconsin Press

Bazerman, C
1983---------- Scientific writing as a social act. In P.Anderson, J. Brockman and C.Miller (eds.) *New Essays in Technical Writing and Communication*. Farmingdale, New York: Baywood.156-184.

1988----------*Shaping Written Knowledge: Essays in the Growth, Form, Function and Implications of the Scientific Article.* Madison, WI: The University of Wisconsin Press.

Beach, R. and L.S. Bridwell (eds).
1984----------*New Directions in Composition Research.* New York. Guilford

Belcher, D
1994----------The apprenticeship approach to advanced academic literacy: Graduate students and their mentors. . *English for Specific Purposes* Vol.13/1:23-34

Belcher, D and G. Braine (eds).
1995----------*Academic Writing in Second Language: Essays On Research And Pedagogy.* Norwood Ablex

Benson, M.J.
1994----------Writing an academic article: an editor writes. *English Teaching Forum.* Vol. 32/2:6-9

Berkenkotter, C; T.N. Huckin; and J.Ackerman
1991---------- Social context and social constructed texts. The initiation of a graduate student into a writing Research community. In C. Bazerman and J. Paradise(eds). *Textual Dynamics of the Professions: Historical and Contemporary Studies Of Writing In Professional Communities*. . Madison, WI: The University of Wisconsin Press.191-215

Berlin, J. A
1988----------Rhetoric and ideology in the writing class. *College English.* Vol. 50: 477-494

Bhatia, V.K.
1994----------*Analyzing Genre: Language Use in Professional Settings.* U.K Longman

Bizzell, P
1982----------College composition: Initiation into the academic discourse community. *Curriculum Inquiry.* Vol. 12/2:191-207

Bloor,M
1984----------English language needs in the University of Cordoba: the report of a survey. Birmingham, UK: The university of Aston LSU (mimeo)

Brandt,D
1986----------Towards an understanding of context in composition. *Written Communication.* Vol.3/2: 139-157

Bruffee, K
1986----------Social construction.Language and the authority of knowledge: A bibliographical essay *College English. Vol 48:773-790*

Canagarajah, A. S.
1996----------Non discursive requirements in academic publishing, material resources of periphery scholars, and the politics of knowledge production. *Written Communication.* Vol.13/4: 435-472

Casanave, C.P
1995----------Constructing Contexts for composing in a graduate sociology program. In Belcher, D and G. Braine (eds). *Academic Writing in Second Language: Essays On Research and Pedagogy.* Norwood Ablex: 83-110

Casanave; C.P.and P.Hubbard,
1992----------Writing assignments and writing problems of doctoral students: Faculty perceptions, pedagogical issues and needed research. *English for Specific Purposes* Vol.11/1:33-50

Chin, E
1994----------Ethnographic interviews and writing research : A critical examination of the methodology. In P. Smagorinsky (ed.) Speaking about writing: reflections on research methodology. *Sage Series in Written Communication.* Vol.8:247-272.

Chin, E.
1994---------- Redefining "context" in research on writing. *Written Communication.* Vol.11/4:455-482

Clyne, M.
1987----------Discourse structures and discourse expectations: Implications for Anglo-German Academic communication in English. In L. E Smith, (ed.) *Discourse Across Cultures.* New York: Prentice Hall: 73-83

1991----------The sociocultural dimension: The dilemma of the German speaking scholars. In Harmut Schröder (ed.), *Subject Oriented Texts: Languages for Special Purposes and Text Theory*. Berlin: Walter de Gruyter: 49-67

Cohen, L and L. Manion
1994----------*Research Methods in Education.* London. Routledge

Connor,U. and S. Mauranen.
1996----------Learning Discipline Specific Academic Writing: A case study of a Finnish graduate Student in the United States. In E. Ventola and A. Mauranen (eds.) *Academic Writing: Intercultural and Textual Issues*. Amsterdam. John Benjamins Publishing Company: 231-253

Cooper, C.
1986----------The ecology of writing. *College English.* Vol. 48: 364-375

Corbett, J.
1992---------- Encoding Nature: Writing science in English. *Federation of European Microbiological Societies letters.* Vol.100:39-44

Corder, P
1983----------Strategies of communication. In C. Faerch and G. Kasper *Strategies in Interlanguage Communication.* Longman :15-20

Day, A.R.
1995----------*How To Write and Publish a Scientific Paper.* Cambridge: Cambridge University Press.

Doheny-Farina, S. and l. Odell
1985----------Ethnographic research on writing: Assumptions and methodology. In I, Odell and D. Goswami (eds) *Writing In Non Academic Settings.* New York. The Guilford Press: 503-535

Dudley Evans, T.
1991----------Socialisation into the academic community: Linguistic and stylistic expectations of a PhD thesis as revealed by supervisor comments. *Socio Cultural Issues in English for Academic Purposes*. Modern English Publications in assoc. with British Council .Vol1/2:41-51

Elbow, P
1973---------- *Writing without Teachers*. Oxford. Oxford University Press

1981----------*Writing with Power*. Oxford. Oxford University Press

Emig, J.
1971----------*The Composing Processes Of Twelfth Graders*. Urbana, IL: National council of teachers of English.

Ewer,J.R and Latorre, G
1969---------- *A Course in Basic Scientific English.* London. Longman

Faigley, L
1985----------Non academic writing: the social perspective. In I, Odell and D. Goswami (eds) *Writing in Non Academic Settings*. New York The Guilford Press: 230-248

Faigley, L. and K. Hansen;
1985----------Learning to write in the social sciences. *College Composition and Communication.* Vol.36/2:140-149

Fish, S
1979----------*Is There A Text In This Class? The Authority of Interpretive Communities.* Cambridge. Harvard University Press

Flower, L.
1994----------*The Construction of Negotiated Meaning: A Social Cognitive Theory of Writing*. Carbondale, IL: Southern Illinois University Press

Flower,L and J. Hayes
1981----------A cognitive process theory of writing. *College Composition and Communication* Vol. 32: 365-387

Freed, R.C. and G.J. Broadhead
1987---------- Discourse communities, sacred texts and institutional norms. *College Composition and Communication* Vol. 38: 154-164

Garfield, E
1967---------- English – An International language for science, *The Information Scientist*, Dec 26 Vol. 1: 19–20.

1983 ----------The Foreign Language Barrier: Problems in Scientific Communication. *Nature.* 303: 554–554

.

1989---------- The English language- The lingua Franca of international science. *Scientist* . Vol. 3:12–12

Garfield, E. and A. Welljams-dorof

1992----------The microbiology literature- languages of publication and their relative citation impact. *Fems Microbiology Letters*. Vol.100:33–38.

Gilbet,G.N
1976----------Transformation of research findings into scientific Knowledge. *Social Studies of Science*. Vol. 6: 281-306

Godman, A and E.M.F. Payne
1981a----------*Longman Dictionary of Scientific Usage. Longman* Group.U.K

1981b----------A taxonomic approach to the lexis of science. In L. Selinker, E. Tarone,E and V. Hanzeli (eds.) *English for Academic and Technical Purposes: Studies in honor of Louis Trimble.* Rowley. Newbury House Publishers

Gosden, H
1992----------Research writing and NNSs: From the editors. *Journal of Second Language Writing.* Vol. 1 /2: 123-129

Grabe,W. and R.B. Kaplan
1996----------*Theory and Practice: an Applied Perspective*. London. Longman

Guba, E.G. and Y.S. Lincoln
1982----------Epistemological and methodological bases of naturalistic inquiry. *Educational Communication and Technology Journal.* Vol. 30/4: 233-252

Halliday, M.A.K., McIntocs,A. and Strevens, P.
1964----------*The Linguistic Sciences and Language Teaching*. London: Longman.

Harouni, Z.
2005----------Negative transfer in the translations of scientific discourse.Proceedings of 5eme colloque International "Stratégie(s) de la traduction": Les enjeux économiques de la traduction. 23-24 mai 2005.

Herrington, A.J.
1986 ----------Writing in academic settings: A study of the contexts for writing in two college chemical engineering courses. *Research in the Teaching of English*. Vol. 19:331-361

Hopkins, A and T. Dudley Evans
1988---------- A genre bases investigation of the discussion sections in articles and dissertations. *English for Specific Purposes.* Vol.7/3:113-188

Horowitz, D.M
1986----------What professors actually require: Academic tasks for the ESL classroom. *TESOL Quarterly*. Vol .20/3: 445-461

Huckin,T and L.Olsen
1981----------Teaching the use of the article in EST. In L. Selinker, E. Tarone and V. Hanzeli *English For Academic And Technical Purposes.* Rowley. Newbury House Publishers.

Johns, A.M.
1990---------- L1 composition theories: Implications for developing theories of L2 composition. In B.Kroll (ed.). *Second Language Writing.* Cambridge. Cambridge University Press: 24-36

Johnson, D.M.
1992----------*Approaches to Research in Second Language Learning*. London. Longman

Kennedy, C and R. Bolitho
1984----------*English for Specific Purposes.* R.H .Flavel. (ed.)London .Macmillan.

Kneller, G. F.
1978----------The Scientific community. In *Science as a Human Endeavour.* NewYork Columbia University Press: 190-213

Krapels, A.R.
1990----------An overview of second language writing process research. In B.Kroll (ed.). *Second Language Writing.* Cambridge. Cambridge University Press: 37-56

Kuhn, T.S.
1970----------*The Structure of Scientific Revolutions.* (Second edition). Chicago. Chicago University press.

Lackstrom,J.E,. Selinker L and Trimble. L.P
1973----------Technical rhetorical principles and grammatical choices. *TESOL Quarterly.* Vol.7: 127-136

Lay,N.
1982----------Composing processes of adult ESL learners. *TESOL Quarterly* Vol .16/3: 406

Levin, R.A and D.K. Jordan
1981----------The predominance of English and the potential use of Esperanto for abstracts of scientific articles. In Kageyama, Nakamura, Oshima and Ushida (eds.) *Science and Scientists.* Tokyo.Japan Scientific Societies Press:433-441

Levin, R.A.
1981----------What languages do phycologists read? *Phycologia.* Vol .20/3: 219-221

Lindsey, D
1978----------*The Scientific Publication System. San Francisco*. Jossey – Bass publishers in social science

Mackay, R and A. Mountford (eds).
1978----------*English For Specific Purposes*: A case study approach. London. Longman

Mage, T.
1981----------Scientific and technical discourse: A comparative analysis of English and Romanian. In L. Selinker, E. Tarone and V. Hanzeli *English For Academic And Technical Purposes.*Rowley. Newbury House Publishers.

Markel, M. H.
1988----------*Technical Writing, Situation And Strategies*. New York St Martins Press

Mason, J.
1995---------- *Qualitative Researching.* London. Sage

McDonough, J.
1985---------- *ESP in Perspective: a Practical Guide*. London. Collins ELT.

Mezghiche, M. and A.Lagha
2006----------La recherche scientifique en Algérie existe t-elle? *Quotidien d'Oran* 22/02/2006.

Moatssime, A.
1992 ----------Le Français est il en recul au Maghreb? *Algérie Actualité* N°1391. (Juin 92):28-29

Murray, D.M.
1980----------Writing as process: How writing finds its own meaning. In T.R.Donovan and B.W.McClelland (eds.).*Eight Approaches to teaching Composition.* Urbana, IL: National council of teachers of English

Myers, G
1985a----------Texts as knowledge claims: of two biology articles construction. *Social Studies of Science.*Vol.15/4:593-630

1985b---------- The social construction of science and the teaching of English: An Example of research. In P. Robison (ed).Process and product *ELT Documents* Vol.129:143-150

1990----------*Writing Biology Texts in the social Construction of Scientific Knowledge.* Madison, WI: The University of Wisconsin Press.

Nunan, D
1992----------*Research Methods in Language Learning. Cambridge.* Cambridge University Press

O.Régent,
1985----------A comparative approach to the learning of specialized written discourse. In P.Riley (ed.) *Discourse and Learning.* New York: Longman: 105-120

Odell, L and D, Goswami
1984----------Writing in non academic settings. In R. Beachand L.S. Bridwell. (eds). *New Directions in Composition Research.* New York. Guilford: 233-258

Oster, S.
1981 ----------The use of tenses in "reporting past literature" in EST. In L. Selinker, E. Tarone,E and V. Hanzeli (eds.) *English for Academic and Technical Purposes: Studies in honor of Louis Trimble.* Rowley. Newbury House Publishers

Paltridge, B.
1997----------Thesis and dissertation writing: Preparing students for research. *English for Specific Purposes* Vol.16/1: 61-70

Parkshurt, C.P.
1990----------The composition Process of science writers. *English for Specific Purposes* Vol.9/1:169-179

Perl, S
1980----------Understanding composing. *College Composition and communication.* Vol.31: 363-369

Prior, P
1991----------Contextualizing writing and response in a graduate seminar. *Written Communication.* Vol.8/3:267-310

1995----------Redefining the task: An ethnographic examination of writing and responses in graduate seminars. In Belcher, D and G. Braine (eds). *Academic Writing in Second Language: Essays on Research and Pedagogy.* Norwood Ablex: 47-82

Rafoth, B.A.
1987----------The concept of discourse community.In Rafoth,b.a and L.R. Donald. *The Social Constructions of Written Communication.* Norwood Ablex: 140-152

Raimes,A.
1987----------Why write? From purpose to pedagogy. *English Teaching Forum.* Vol. 24/4: 36-55

1991----------Out of the woods: Emerging traditions in the teaching of writing. *TESOL Quarterly* Vol .*25/3:* 407-430

Reither, J.
1985----------Writing and knowing: Towards redefining the writing process. College English Vol. 47: 620-628.

Robinson, P. (ed.)
1980----------*English for Specific Purposes: the current position.* London Pergamon.

Roe, P
1997----------Authority and the ESP age. Unpublished document. Birmingham; UK: The University of Aston, LSU.

Rostaing, H; V. Leveille, & B Yacine.
2001----------Bibliometric Study as an Objective Vision of the Algerian Scientific Research Practices. Proceedings of the 8th International Conference on Scientometrics and Informetrics, Australia.

Rymer, J.
1988---------- Scientific composing processes: How eminent scientists write journal articles. In C.A. Jollifee (ed.).*Advances In Writing Research: Writing In Academic Disciplines.* 2. Norwood Ablex: 211-250

Santos, T
1992----------Ideology in composition L1 and L2. *Journal of Second Language Writing.*1/1:1-15

Sapir, E.
1921----------L*anguage.* New York. Harcourt Brace.

Seliger,H.W and E. Shohamy.
1989----------*Second Language Research Methods.* Oxford: Oxford University Press.

Shaw, P
1991----------Science research students composing processes. *English for Specific Purposes* Vol.10/3:189-206-120

Silva, T
1990----------Second language composition Instruction: Developments, issues, and directions in ESL. In B.Kroll (ed.). *Second Language Writing.* Cambridge. Cambridge University Press: 11-23

Simanek, D.E
(undated doc.)---------- Purging Prepositions Using P-Prime (http://www.lhup.edu/~dsimanek/home.htm)

Sionis, C.
1995 ----------Communication strategies in the writing of scientific research articles by non native users of English. *English for Specific Purposes.* Vol. 14/2:99-113

Slougui, D
1995---------- -ESP: Where does the real problem lie? Conference proceedings, the Maghreb ESP Conference. Sfax-TUNISIA (May 1995)

Sommers, N
1980----------Revision strategies of student writers and experienced adult writers. *College Composition and Communication.* Vol.31: 378-388

St John, M.J.
1987----------Writing processes of Spanish scientists publishing in English. *English for Specific Purposes* Vol.6/2:113-120

Swales, J. M (ed.)
1978----------Writing 'Writing Scientific English'. In Mackay, R and A. Mountford (eds.). *English For Specific Purposes*: A case study approach. London. Longman: 43-55

1981---------- Episodes in ESP: A reader on historical principles. Birmingham; UK: The University of Aston, LSU.

1984----------*Writing Scientific English* .Surrey. Nelson

1985a----------English language patterns and authors' first language: preliminary explorations *Scientometrics* 8/1: 91-101

1985b---------- *Episodes in ESP*. Hemel Hempstead, UK: Prentice-Hall

1987----------Utilizing the literatures in teaching the research paper. *TESOL Quarterly* 21/1: 41-67

1990----------*Genre Analysis: English in Academic and Research settings.* Cambridge: Cambridge University Press

1992----------Competition and discourse community: Introductions from Nysvenska studier. In Gunnarson,B.L, Linell P andB.Nordberg (eds.)*Text and talk in professional contexts.* The Swedish Association of Aplied Linguistics: 9-21

Swales, J.M. and C.B. Feak (eds.)
1994----------*Academic Writing for Graduate Students: A course for NNS of English.* Michigan: Michigan University Press.

Swan, M.
1996---------- *Practical English usage* Oxford. Oxford University Press

Truchot, C.
2001----------The languages of science in France: Public debate and language policy. In Ammon (ed.). *The dominance of English as a language of science: effects on other languages*. Berlin: Walter de Gruyter: 288-319

Ventola,E. and A. Mauranen (eds.)
1991----------Non-native writing and native revising of scientific articles. In E.Ventola (ed), *Functional and Systemic Linguistics. Approaches and Uses*. Berlin: Mouton de Gruyter. 457-492

1996----------*Academic Writing : Intercultural and Textual Issues*. Amsterdam. John Benjamins Publishing Company, vi-xi

Watson-Gegeo, K.A.
1988----------Ethnography in ESL: defining the essentials. *TESOL Quarterly.* Vol. 22/4: 575-592

Weber,G.
1987----------The battle of the giants –Has English beaten French? *Language and Society.* Vol. 46:17-21

Weir,C and J. Roberts.
1994----------Evaluation in ELT. In. Crystal. D and K. Johnson (eds.) Applied Language Studies Series. U.K. Blackwell: 130-161

Widdowson, H.G
1979----------*Explorations in Applied Linguistics.* Oxford. Oxford University Press.

1983----------*Learning Purpose and Language Use* Oxford. Oxford University Press.

Zahlan,A.B.
2000---------- Knowledge and Development in the Arab World. Third Mediterranean Development Forum. Cairo. 2000

Zamel, V.
1982----------Writing: The process of discovering meaning. *TESOL Quarterly*, Vol. 16/2:195-209

1983----------The composing process of advanced ESL students: six case studies. *TESOL Quarterly* Vol .17/: 165-187

Official Documents

Agence **N**ationale pour le **D**éveloppement de la **R**echerche **U**niversitaire [ANDRU]
2008----------La production scientifique réalisée dans le cadre des programmes Nationaux de recherche domiciliés à L'ANDRU de 1998 à 2003 : Analyse bibliométrique.

Arrêté du 25 août 1971 portant mesures d'intégration d'un enseignement en langues étrangère. Art.2

Evaluation of **S**cientific **T**echnology and **I**nnovation capabilities in **ME**diterranean countries. [ESTIME]
2007----------Country leaflet Algeria. Project n°INCO-CT-2004-510696. OST

Décret n° 76/43, du 20 février 1976 portant création de la post graduation

LOI N°98-11, *Journal officiel de la République Algérienne*, 62: 3-42, 1998

United **N**ations **Ed**ucational, **S**cientific, and **C**ultural **O**rganization [UNESCO]
2001---------- -- The state of science and technology in the world, 1996-1997. Montreal, Quebec: UNESCO Institute for statistics.

APPENDIX A:

Stages in getting a submitted paper published

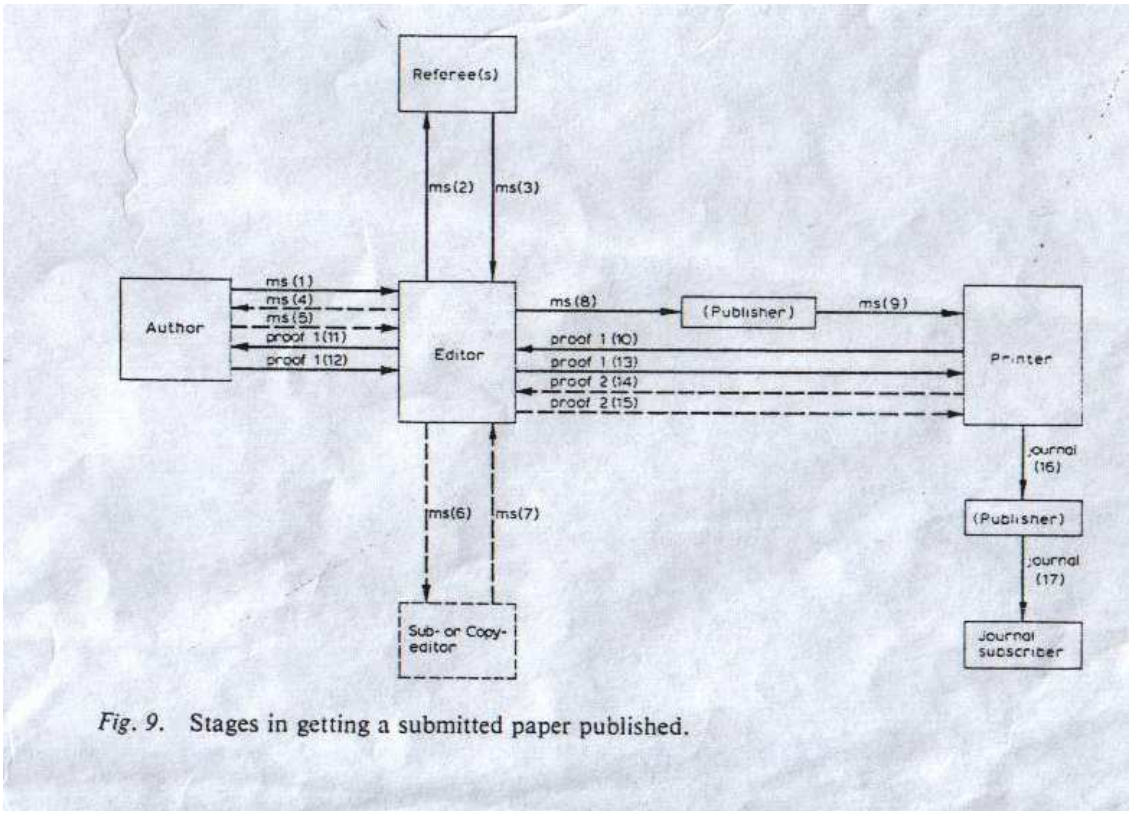


Fig. 9. Stages in getting a submitted paper published.

(Source: Day, 1995:76)

APPENDIX B:

INTERVIEW SCHEDULE

INTERVIEW SCHEDULE

Introductory Statement

Le but de cette recherche c'est d'essayer de comprendre le processus de la publication scientifique en Algérie. Plus particulièrement nous nous intéressons au rôle que joue la langue anglaise dans la communauté scientifique. Nos questions s'articulent autour des stratégies de rédaction et de publication que les chercheurs algériens ont développées pour publier les résultats de leur recherche dans des revues internationales. Nous souhaitons identifier les problèmes afin de proposer des solutions à notre niveau..

Generating the Idea for Publication

1. Quelle est l'importance de la publication chez un chercheur scientifique?
2. Comment l'idée de la publication est –elle née chez vous ?
3. Est-ce que les résultats à publier sont préalablement discutés ?
4. Sur quelle base choisissez vous le journal dans lequel vous publiez?
5. Avez-vous essayé de soumettre votre contribution à un journal bien coté ?

Drafting /Writing in English

6. Comment procédez vous pour rédiger en Anglais ?
7. Comment aviez vous appris à rédiger en Anglais ? Comptez- vous sur quelqu'un pour vous aider dans la rédaction ?
8. Quelles sont les difficultés que vous rencontrez en rédigeant en Anglais ?
9. Quelles sont les difficultés que vous rencontrez en rédigeant en Francais?

Revising/Editing (prior to submission)

10. Est ce que votre papier est relu pour une correction linguistique? A qui faites vous appel pour la révision linguistique?
11. Êtes vous satisfait de cette révision?

Submitting the manuscript

12. Il est souvent dit que le monde de la publication scientifique est bien gardé. Prenez vous certaines précautions, ou utilisez vous certaines subtilités qui vous facilitent l'entrée ? Par exemple,
    a) Aviez vous essayé d'inclure dans vos références des "éventuels" référées?
    b) Aviez vous présenté votre article lors d'une conférence avant de le soumettre a publication?
13. Quelle adresse de correspondance utilisez-vous ? Est ce que cela à un sens ?

Co authorship

14. Pourquoi plusieurs auteurs ?
    a) Est ce que l'ordre des nom a une certaine importance?
    b) Est-ce qu'il y a une répartition des taches entre vous

15. Est-ce que le l'article a été lu par tous les membres de l'équipe avant sa publication ?

Evaluating the manuscript

16. Pensez vous qu'il y a une part de subjectivité de la part des référés quant ils rejettent un article ?
   a)D'abord parce que l'anglais est une langue étrangère pour les algériens
   b) Ensuite parce que vous venez d'un pays du tiers monde
17. Quels sont les critères d'évaluation d'un article?
18. Pensez vous qu'un article puisse être rejeté sur une base purement linguistique ?
19. Etes vous découragé après un rejet ? Abandonnez vous l'idée de publier ?
20. Sur quoi portent les révisions. Quels changements sont proposés en cas d'acceptation ?
21. combien de fois généralement réécrivez vous l'article ?

General comments

22. A quoi attribuez- vous le problème de la publication en Algérie?
23. Comment pensez vous que la situation puisse être améliorée ?

APPENDIX C : INTERVIEW TRANSCRIPTIONS

TRANSCRIPTION 01

Interviewee. A.M
Participant: **H**
Setting : university

1. Quelle est l'importance de la publication chez un chercheur scientifique?

L'efficacité d'un enseignant à l'université, d'un chercheur se mesure à sa publication. C'est une unité de mesure…. Comment prouver que vous êtes dans le domaine scientifique, que vous activez scientifiquement si vous n'avez pas de publications…

2. Comment l'idée de la publication est-elle née chez vous?

chaque fois que nous avons des éléments publiables relatifs à une activité scientifique, on publie que ce soit la préparation d'une thèse, ou relatif à notre activité scientifique...chaque fois que nous avons des données dans notre domaine on les publies

3. Aviez vous discuté l'idée de publication avec certains de vos collègues?

Pas l'idée de publier, mais je leur fait partager par exemple une lecture, je vois leur critiques....spécifiquement avec ceux avec qui je suis en contact direct.

- Avec qui est elle généralement discutée?

Discuter (la publication) avec les collègues nationaux avant tout et secondairement pour avis avec les internationaux

4. Sur quelle base choisissez vous le journal pour la publier?

Premièrement la spécialisation. , le journal se rapporte au profil du travail. Deuxièmement parce que c'est un journal assez bien coté. Ce n'est pas le top mais on a une classification. Dans le domaine de la physiologie le premier c'est le MJP, le 2$^{eme...}$, le 3^{éme} ...donc on choisit en fonction justement de la consistance de l'article.

5. Avez-vous essayé de la soumettre à un journal top ?

Je sais pertinemment si je le soumets à la MJP il va recevoir des critiques. Il peut rester 2 ans pour être publié par contre les référées sont moins exigeants dans le 2éme journal et ainsi de suite ...au cas où il y a rejet je vais tenter un autre

6. Comment procédez pour rédiger en Anglais? Avez vous fait appel a une aide quelconque?

J'ai appris l'anglais moi même. L'anglais beaucoup plus écrit que parlé...aussi par expérience et de par toutes mes lectures faites. je sais écrire mais quand l'article est proprement fait, je le fais lire par ceux qui sont anglophones soient ceux qui ont fait des études en Angleterre soient qu'ils ont enseigné dans des instituts de langues. Donc formés dans cette langue.

7. How was the writing skill acquired was answered in 6.

8. Quels types de difficultés rencontriez- vous en rédigeant en anglais?

Non il n'y a pas de difficultés. C'est un peu plus lent et c'est tout. Quand je décide de publier en anglais, généralement j'écris directement en anglais dés le départ. je suis arrivé à faire un peu la nuance entre le mode d'écriture en anglais et en français je sais exactement le mode de pensée… comment l'autre il pense .pour dire telle phrase il n'y a pas tellement de problèmes la dessus... comme je connais les nuances j'écris directement. Je connais les nuances donc j'écris directement en anglais.

9. Quels types de difficultés rencontriez- vous lorsque vous rédigez en français?

Quand j'écris en français il m'est difficile de le traduire une 2éme fois. je me suis rendu compte que je passe plus de temps. Ce que je fais d'ailleurs : premier jet en anglais rapide puis je le corrige. Là sur le plan de la langue mais techniquement je n'ai aucun problème techniquement je veux dire. Parce que ma terminologie est technique inhérente au sujet. Là je n'ai aucun problème parce que c'est pareil

10. Est ce que votre papier a été relu pour une correction linguistique?

Pas tout a fait révision approfondie. C'est juste…le problème c'est qu'ils ne sont pas spécialisés dans le domaine. Ce que je leur fais lire moi … c'est que je n'ai pas commis des fautes de sens …Généralement je ne fais pas de fautes de grammaire et d'orthographe. En grammaire et en orthographe, Je m'en sors.

11. Etes vous satisfait de cette correction?

Elle n'est pas tellement convaincante. Comment dirais-je?… je pense qu'ils manquent eux même d'expérience, de traduction bien que dans ce contexte il ne s'agit pas exactement de traduction parce que le texte est déjà écrit en anglais .Je l'ai fait plusieurs fois mais généralement ils n'apportent pas grand chose. Finalement je ne change en rien ... c'est une lecture superficielle. Même quand ils lisent eux même, ils éprouvent beaucoup de difficultés à corriger. Moi je le sais même quand je leur donne c'est principalement si toutefois ils repèrent des fautes flagrantes ; pour relever si je n'ai pas commis un délit, des fautes graves c à d vocabulaire non approprié; mais généralement je n'ai jamais eu de critiques la dessus.

12. Il est souvent dit que l'entrée dans le monde de la publication scientifique est difficile. Prenez vous certaines précautions pour faciliter cette entrée ? Par exemple, Aviez vous essayé d'inclure dans vos références des "éventuels" référées?

Non .je mets les références qu'il fallait mettre

-Aviez vous présenté votre article lors d'une conférence avant de le soumettre a publication?

Non le papier n'a pas été lu lors d'une conférence.

13. Quelle adresse de correspondance mettez vous et pourquoi ?

Ah ! là généralement je mets là où je suis installé mais quand j'étais en France je mets quelqu'un d'autre. Quelquefois il faut payer j'ai pas de

sous pour payer la parution ...pour des raisons pratiques je mets l'adresse du correspondent chez un co auteur qui participe la aussi.

14. Qui sont les auteurs ? Qu'a fait le premier pour être cité en premier? Est ce que l'ordre des nom a une certaine importance?

Tous ceux qui contribuent, qui ont contribué à cet article; dans l'article je mets d'abord celui qui rédige l'article c'est le premier nom, bien sûr, mais celui qui rédige l'article c'est celui aussi qui a généralement contribue le plus pour l'obtention d'un résultat. Deuxièmement c'est celui qui a contribue un peu moins. Soit sa contribution est technique au niveau des laboratoires de l'investigation soit sa contribution est au niveau de la rédaction. L'essentiel, c'est classé, je les classe par ordre de contribution. Le dernier effectivement souvent c'est le chef du laboratoire qui chapeaute le laboratoire même s'il n'a pas contribué.....dans ma dernière publication comme les résultats ont été obtenu a l'étranger principalement le dernier j'ai mis celui du laboratoire.

15. Est ce que l'article a été lu par vos collègues avant de le soumettre?

D'abord je nuance quand j'écris l'article je pose des questions a mes collègues…. Il est vrai, Je ne leur donne pas l'article à lire mais quand j'ai des problèmes quelquefois techniques quelquefois de phraséologie je leur pose la question: voilà ce que je pense, est ce que c'est juste ou faux; donc ils me donnent leur avis. Je sais que j'ai une difficulté la dessus est ce que c'est bien ce terme qu'il faut utilisé ? Cette phrase qu'il faut dire même en français parce que la traduction ce n'est pas un problème .L'idée elle même peut être discutée je la soumets souvent a des collègues les plus proches bien sure et quand il s'agit de concepts ou bien de choses techniques je demande leurs avis.

16. Dans les cas de rejet, pensez vous qu'il y a une part de subjectivité de la part des référés ?

Il s'agit d'un anonymat. C'est la valeur scientifique qui dicte le sort d'un article.

17. Sur quelle base l'article est rejeté ?

Les référés n'ont pas proposé le rejet. C'est l'éditeur, par contre dans leur commentaires a trois ils n'ont pas relevé la même chose ce n'est pas une même critique que j'ai retrouvée dans les trois par contre effectivement j'ai eu des critiques d'un journal qui finalement après j'ai retrouve sa référence que j'avais en possession , qui se rapportait un petit peu au sujet et que je n'ai pas traitée .je savais pas cette subtilité finalement la décision finale a été signée par un auteur que je connais et dont j'ai les références ; dont le travail ne se rapporte pas directement donc je ne pouvais pas l'exploiter dans les références mais qui est finalement expert dans le domaine .donc je sais pas si ça a un lien...la plus part de nos laboratoires maintenant tournent le dos au laboratoire vu que si on entreprend une recherche on ne peu plus la faire complètement si on veut analyser quelque chose on ne peut pas. Nous ne disposons pas de toutes les techniques ; tel n'est pas le cas en Angleterre ou en Europe parce qu'il y a des relations inter laboratoires, ils peuvent négocier une analyse dans un autre laboratoire, la payer. Ici tout cela nous ne l'avons pas tout est indépendant vous ne pouvez pas faire une analyse dans un autre laboratoire, vous ne pouvez ni le payer ni...et vous n'avez même pas les moyens de le payer si on vous dit de le payer. Vous n'avez pas un budget pour cela. la production des résultats techniques ont fait que maintenant on fait beaucoup plus en ce qui concerne la nutrition on fait beaucoup plus l'éducation. On fait les enquêtes on travaille par le questionnaires nous ne travaillons plus au niveau de l'organisme on travaille au niveau de la population au lieu d'étudier le bienfait.

Donc il s'agit d'une omission dans les références.

Oui. Si l'on veut.

18. Pensez vous qu'un article puisse être rejeté sur une base purement linguistique ?

Cela est possible, mais nous faisons tout pour éviter cette situation.

19. Etes vous découragé après un rejet ? Abandonnez vous l'idée de publier ?

Oh non nous avons dépassé cette situation, La possibilité de rejet est toujours présente mais nous nous préparons souvent à soumettre à d'autres revues.

20. Sur quoi portent les commentaires des référés. Quels changements proposent ils ?

Les commentaires portent sur le fond et sur la forme. Cela dépend des insuffisances qu'ils ont remarquées.

21. Combien de fois en moyenne un article est réécrit

Trois fois

22. A quoi attribuez- vous le problème de la publication en Algérie?

Nous ne publions pas parce que effectivement c'est un problème de traditions et de culture; on n'a pas été acculé à publier. Deuxièmement on ne publie pas parce que même si on enlève le fait de la promotion; est ce que nous ne devons pas publié? C'est ça le problème. un universitaire qui ne fait pas connaître ses résultats n'a pas sa raison d'être;. je dis donc… l'efficacité se mesure avant tout à la publication… c'est avant tout une affaire de traditions beaucoup plus que d'autres choses.…parce que maintenant si vous êtes professeur vous ne publiez plus, ou si vous êtes maître de conférence vous ne publiez plus. nous assistons a ça. Le problème de la publication c'est avant tout une tradition et de conviction de sa raison d être dans cette l'université.

Deuxième point Quels sont les moyens pour publier? il faudrait avoir une production scientifique c'est a dire des résultats de recherche lesquels résultats sont liées a l'outil de travail: a savoir le laboratoire en ce qui nous concerne… que nous n'avons pas nous ici …nous avons tendance de plus en plus à aller vers le terrain social et économique en rapport avec notre formation.

23. Comment pensez-vous que la situation puisse être améliorée ?

Un point important aussi …la stabilité dans un domaine est importante pour faire de la recherche et pour produire des articles… si dans une université ou dans un institut nous n'avons pas un axe de recherche bien clair, net où tout le monde s'oriente pour faire une spécialité là nous ne pouvons pas maintenir un débit de publications. si chaque fois nous travaillons sur une question de manière sporadique, spontanément et ponctuellement …on passe d'une question à l'autre parce que nous n'avons pas des axes de recherche clairs et nets il n'y a pas de politique de recherche que se soit a in niveau local ou national.……nous ne sommes pas performants. La performance moi je ne peux pas écrire un article de niveau si moi je n'ai pas le niveau requis. Pourquoi l'étranger parce que nous avions eu la possibilité de partir a l'étranger te d'utiliser un laboratoire.

TRANSCRIPTION 02

Interviewee : S. Z

Participant :**G**

Setting: HOME

Time spent: 60mn

1. Quelle est l'importance de la publication chez un chercheur scientifique?

Un travail de recherche quand il a des résultats originaux. càd quand on commence une recherche le but est une publication. C'est une reconnaissance publique, internationale du travail que tu fais. Quand tu as des résultats originaux c'est tout a fait normal de publier.…Les publications sont nécessaires pour que je puisse faire ma thèse d'état en biologie.

2. Comment l'idée de la publication est elle née chez vous?

On ne décide pas de la publication. c'est des manipulations que l'on fait toute la journée, que l'on fait sur plusieurs échantillons .on fait et on refait .j'écris la manière de faire ces manip comme ça s'il y a une erreur après ou s'il a un problème je les écris sous forme d'une phrase par exemple telle manip a marchée.

Les résultats on ne les cherche pas parce que les résultats sont soit sur des gels soit sur on prend tout le temps des photos quand je prends mon cahier de résultats je dis j'ai trouve ça ou je n'ai pas trouve. Je ne m'y étends pas la dessus ce que je voulais et au fur et a mesure je rajoute résultat a résultats et quand je trouve un résultat original à ce moment la je le montre à mon promoteur et la perspective se la publication est là

3. Est ce que les résultats à publier sont préalablement discutés avec les collègues ou autres?

Je ne partage pas l'idée avec les collègues ici parce que je ne fait pas un travail en Algérie ;càd je suis télécommandée ici. J'ai un programme de travail que je ramène de France parce que mon promoteur est là bas , J'ai une Codirectrice ici mais disons que mon travail je le fais en France , je sais ce qu'il faut faire une fois que je suis ici;… il n'y a pas personne qui soit de la spécialité.

4. Sur quelle base choisissez vous le journal de la publication?

Le premier critère c'est le critère de spécialité…je ne vais pas aller par exemple dans un journal qui fait de la physiologie végétale ou bien de la biologie moléculaire. Dans ma spécialité, il y a un certain nombre. alors ça dépend des travaux qu'on fait par exemple il y a des travaux que l'on fait au USA que l'on ne peut pas faire en France parce que on n'a pas les moyens matériels , parce qu'il n'y a pas aussi des chercheurs aussi spécialisés que ceux que l'on retrouve aux USA donc là ça dépend du niveau par exemple je ne pourrais jamais publier dans *science*. Parce que je travaille en France peut être si je travaillais aux USA ça pourrait peut être passer dans *Nature* mais en France ce n'est pas du tout évident. je cible. il y a aussi des notations de revues et ca a été le premier critère quand j'ai discuté avec mon promoteur on voit les résultats des travaux. Est ce que ce sont des travaux originaux? est ce qu'ils ont une portée très importante est ce qu'il sont moins important que d'autres résultats et en fonction de cela on les envois a tel ou tel journal par exemple *Human Mutation* est un journal très coté l'article n'a pas été accepte sous cette forme on m'a demande de le changer de l élaguer. pour moi ça le dévalorisera parce que ce n'est pas un travail qui n'a pas un niveau scientifique; c'est un travail qui a un bon niveau scientifique. le problème c'est qu'il faut que j'en rajoute d'autres manipulations. Je préfère encore faire d'autres manip et en faire un travail plus complet que de le mettre sous forme de notes; Si je fais des "gels shifts" je pourrais toujours le soumettre a cette même revue . Ils m'ont demandé de le mettre dans

Blood. Mais *Blood* est un journal Américain à 100% ? c'est le seul journal dans notre spécialité càd si je publie dans *Blood …*

5. Avez vous essayé de soumettre votre article à une revue Top ?

Sous cette forme (*HM)* l'aurai uniquement mis sous forme de "short communication" mais pour *Blood* ça aurait été "correspondence" c'est une lettre. Ce n'est pas un article enfin on peut considérer ça comme un article mais pour eux c'est une correspondance… (Aux USA quand on voit lettre à *Blood* ,par exemple, sur un CV la candidature est potentiellement acceptée).En fin de compte en biologie moléculaire ce qui se passe. Eux , ont déjà travaillé sur toutes les maladies génétiques enfin quand je dis toutes j'exagère .enfin je dis ils ont travaillés sur tout leur matériel càd que les maladies chez eux ils savent ce que c'est .ils savent quelles maladies quels types de maladies, quels types de mutations ils ont dans leur pays .maintenant ce qu'ils sont entrain de faire c'est de se retourner vers les pays du tiers monde, vers les pays sous développés dont ils ne connaissent pas très bien la population et auxquelles ils ne peuvent pas avoir accès comme nous on a accès.(C'est pour ça que moi J'ai été reçu a bras ouverts dans mon labo parce que je ramène du sang frais; et c'est vraiment du sang frais que je ramène)… comme la mutation que j'ai trouvée ils ont du cherché en France , ils ont du chercher aux USA ils n'ont pas trouvée du moins ils ne l'on pas encore trouvée.

6. Comment avez vous procédez pour rédiger votre article en Anglais?

Ecrire un article en Anglais, c'est simple. Pour moi qui ne connais pas l'anglais, j'ai été bonne en anglais au lycée certes, mais je ne pratique pas l'anglais. ça a été simple pourquoi? Parce que j'avais fait tout seule mon travail. Je savais exactement pourquoi j'avais obtenu ces résultats, comment je les avais obtenus .càd j'ai appris a travailler au fur et a mesure donc les résultats ils étaient déjà dans ma tête, ils étaient digérés. Il fallait juste les présenter de telle manière mais disons que je maîtrisais mon sujet. Ça ma énormément aidé au moment d'écrire.

La deuxième chose c'était que je voulais directement écrire en anglais .c'était simple pour 2 raisons: je ne voulais pas écrire en français avoir a traduire après .c'est un double travail. J'étais pressée parce que il faut tout de suite publier. Il faut tout de suite publier quand on a des résultats sinon quelqu'un d'autre peut les trouver et les siffler .et la deuxième chose pour écrire on se base sur d'autres articles càd c'est mes lectures qui ont fait que ça m'a facilité énormément - je dirai - l'acte d'écrire . Parce que les phrases étaient déjà prêtes dans ma tête a force de lire ; parce que je ne suis pas la seule a avoir travaillé sur ce sujet il y a plein, plein de publications ce ne sont pas les mêmes résultats que les miens, bien sur .mais depuis 20 ans que les gens travaillent sur les mêmes thèmes quand on parle d'hémoglobine, de polymorphisme quand on parle de "restriction science" etc. çà c'est connu dans notre jargon. Et puis ce qui m'a encore facilité les choses c'est que mon travail était clair, je n'avais pas à me gratter la tête pour me dire tiens comment je vais expliquer çà. les résultats étaient clairs. J'ai fait ça et ça et je ramène les preuves matérielles parce qu'il faut les photos donc ce n'était pas difficile.

7. Est ce que vous avez demandé de l'aide à quelqu'un pour la rédaction?

Non je voulais pas .J'avais la possibilité de le faire avec le collègue qui m'avait encadré pour les manipulations pratiques mais là je me suis dit je préfère tout écrire parce que qu'on le veuille ou pas c'est mon travail personnel. on m'a appris les manip, mais les manip c'est moi qui les ai faites, l'échantillonnage, c'est moi qui l'ai récupéré, c'est moi qui suis allée chercher les personnes. c'est vraiment un travail personnel et - ça j'en suis vraiment très fière - personne n'a fait la manip à ma place, personne n'est allé chercher les personnes à ma place .et je voulais d'un coté parce que je maîtrisé mon sujet je voulais écrire et de l'autre je me dis au cas où l'an prochain je dois faire une publication et que telle ou telle personne n'est pas là comment je vais faire ;je vais me gratter la tête et la troisième chose , j'ai un style qui m'est propre. Si une deuxième personne devait écrire il y aurait deux styles différents .je n'aurais pas été d'accord avec elle et là ça aurait peut être créer d'autres problèmes .Qu'on me corrige je suis d'accord mais qu'on écrive pas à ma place .je revendique mes erreurs.

8. Quelles difficultés aviez vous rencontres lors de la rédaction en Anglais?

Honnêtement la rédaction n'était pas difficile. elle m'a demande beaucoup de travail mais en elle même ce n'était pas un travail difficile .ce n'était pas difficile parce que je ne devais pas philosopher .je n'avais pas besoin de termes pour philosopher; je ne dis pas que mon texte était bon parce qu'il a été corrigé et recorrigé.

9. Quels types de difficultés rencontriez- vous lorsque vous rédigez en français?

Not concerned by the question.

10. Est ce que votre papier a été relu pour une correction linguistique?

Je suis d'abord passée par mon encadreur technique parce que lui a déjà publié dans plusieurs journaux donc il connaît le jargon scientifique et lui était dans un labo qui publie depuis 5ans .moi j'arrive d'Algérie je n'ai jamais publié donc c'est la première fois de ma vie que j'écrivais un article. Donc je me suis faite toute petite sauf bien sur lorsqu'il s'agissait de points que je voulais absolument garder là je défendais absolument mon avis .pour moi c'est tout a fait normal. Mais de réelles difficultés non. Çà a été long. Ce n'était pas difficile.

11. Etes vous satisfait de cette correction?

Answered previously

-Combien de temps cela vous a t- il pris ?

Cela m'a pris trois mois. Mais quand je dis trois mois c'est pas trois mois pour l'écrire .j'ai écris en un mois. Quand j'ai vu que mon résultat était original j'ai arrêté les manip je me suis dit c'est fini maintenant je tiens le sujet de publication, je commence; j'ai commencé a écrire mais avant de commencer a écrire, j'ai pris une semaine relire tout ce qui a été fait. J'ai fait de la recherche bibliographique pour vérifier que mes résultats sont

originaux, qu'ils n'ont pas été publiés J'ai utilisé l'ordinateur pour vérifier. J'ai pris une dizaine de jours pour lire puis j'ai commencé a rédiger .la rédaction a duré un mois… parce que je faisais également les manip.

12) Il est souvent dit que l'entrée dans le monde de la publication scientifique est difficile. Prenez vous certaines précautions pour faciliter cette entrée ? Par exemple,

a)Aviez vous essayé d'inclure dans vos références des "éventuels" référées?

Aucune stratégie n'a été développée .J'étais sure de mes résultats.

b) Aviez vous présenté votre article lors d'une conférence avant de le soumettre a publication?

Oui j'ai fait une communication .mais c'est une communication qui a été faite avant de trouver les résultats avant d'avoir le résultat original. C'est une communication de la moitié du travail càd j'avais découvert des choses intéressantes càd j'avais découvert des indices qui permettaient de dire qu'il y avait quelque chose de nouveau et j'avais fait la communication avant de trouver les résultats.

13. Quelle adresse de correspondance mettez vous et pourquoi ?

Les deux. Je suis ici et là bas.

14. Pourquoi plusieurs auteurs ?

Quand on dit travail d'équipe on ne veut pas dire que le travail est équivalent. càd que le travail que j'ai fait (d'ailleurs c'est pour cela que j'ai tenu a être en premier c'est un travail personnel) il y des gens qui m'ont aidés ce qui est tout a fait normal et leur noms se retrouvent sur l'article.

a). Est ce que l'ordre des noms a une certaine importance?

Quand tu vois un article, la première personne c'est la plus importante. C'est elle qui porte le travail sur son dos. Les derniers sont aussi les plus importants. il ne faut jamais voir ce qu'il y a au milieu . Le dernier et l'avant dernier - c'est généralement dans 99% des cas - c'est le directeur, le 'protecteur'. La deuxième position veut dire qu'il a vraiment contribué au

travail. Txxxxx. lui en quoi il a contribué ? ça a été la personne qui m'a appris toutes les manipulations et quand j'avais des résultats que je ne comprenais pas parce que j'étais nouvelle et que je faisais des manip pour la première fois on discuté de mes résultats a chaque fois .si j'avais fait des erreurs de manip il m'expliquait le problème ou bien il me poussait a réfléchir càd il a rempli le rôle de directeur de thèse parce que le directeur de thèse c'est normalement lui qui doit contrôler tout cela mais comme ils sont tellement pris ils ne font plus de paillasse. K ne fait plus de paillasse depuis quinze ans et nous sommes au courant de certaines manip que nous sommes d'ailleurs entrain de mettre sur pied que lui ne connaît pas on lui propose .Lui par contre a une très grande capacité d'analyse. Moi personnellement je lui tire chapeau parce que si l'article est comme ça c'est grâce a lui.…Lui c'est comme de l'or au fond d'une mine tu ne le vois pas il faut d'abord enlever toute la pierre et c'est là où tu vois une pépite d'or mais quand il est dans une mine tu ne vois jamais que c'est de l'or et justement lui a enlevé beaucoup de choses. il a remis les choses en place. il m'a poussée a mieux expliquer certains éléments a enlever carrément d'autres qui cachaient , qui n'avaient pas beaucoup d'importance qui faisaient vraiment lourd donc lui m'a permis de bien montrer l'article et R D. la troisième position par rapport a cela n'a pas une grande importance .elle n'a presque rien fait. elle a contribué au travail en faisant les dosages elle est technicienne elle s'occupe d'un appareil mais comme elle est chef de service on est obligé de la mettre c'est elle qui a fait les dosages et les dosages sont importants ; C'est un appareil assez automatique que nous n'avons pas dans notre laboratoire je ne peux pas aller me servir dans son labo donc il faut que ca passe par elle ; elle , elle me donne les résultats et c'est a partir de là que moi je fais mes manips; parce que ses dosages me permettent d'élaguer les gens qui ne sont pas intéressants par exemple si elle me dit que quelqu'un est anémique je ne travaille pas dessus …

15. Est ce que l'article a été lu par tous les membres de l’équipe avant de le sa publication ?

Dans mon cas c'était un truc a étages. Moi j’écrivais, je montrais a celui qui m’encadre, il le corrige, je le réécrivais, je lui soumettais il le

recorrigeait encore. ça c'était avant de le soumettre au grand boss parce que on ne voulait pas lui donner un premier jet en plus comme je n'avais jamais écris…il fallait que le travail soit le plus présentable possible. Une fois qu'il a été soumis, K (promoteur) a beaucoup corrigé, on s'est battu sur pas mal de petits trucs sur lesquels je n'étais pas d'accord que je voulais garder et tout, mais en fin de compte il a été bien… mais lentement corrigé.

16. Pensez vous qu'il y a des préjugés ou subjectivité vis a vis de certains auteurs qui ne sont pas anglophones?

Je ne pense pas parce que dans ce cas là .parce que ça dépends du labo. Est ce que le labo a déjà publié dans le journal? s'il connaissent plus ou moins ; ce n'est pas un labo ou quelqu'un qui arrive du jour ou lendemain si j'envoyais de l'université de Constantine je vous dirais peut être .mais comme c'est un labo qui a déjà l'habitude de publier c'est comme même l'INSERM ce n'est pas n'importe quelle structure de recherche .C'est comme même la première structure médicale de recherche en France qui est un organisme publique donc je dirais il y a un minimum de sérieux c'est pas un labo inconnu .c'est connu et reconnu et puis il y a des référés français et tout ….Les "communicating editors" sont des référés.

17. D'après vous sur quelle base un article est évalué?

Dans une publication rien n'est négligé. Il y l'exclusivité des résultats, la méthode, le matériel utilisé même le choix le choix du sujet. Par example, dans ma thèse de magister j'avais travaillé sur des animaux. C'était un sujet qui était intéressant …j'avais terminé avec les animaux puis je me suis dis moi je suis entrain de me casser la tête pour faire de la recherche fondamentale pourquoi ne pas m'intéresser a l'humain surtout dans le domaine des maladies génétiques parce que depuis une dizaine d'années on en parle énormément on en parle beaucoup et cela m'intéresse énormément et puis bon moi ce que je voulais c'est aller au cœur de la vie. Le cœur de la vie c'est l'ADN; c'est le gène. Au lieu d'aller autour moi je me suis dit je cible la base et puis c'est tellement intéressant et il y a plein

de chose a découvrir càd je ne voulais pas être satellite je voulais aller au fond du problème et puis ce qui m'intéressait c'était le fait de savoir que je n'étais peut être pas impliquée directement dans la recherche du médicament dans la thérapie génique j'espère que ça arrivera un j'espère que je pourrais travailler dessus mais je me dit si je ramène ne serait ce qu'une petite pierre a l édifice de la connaissance .parce que la thérapie génique comment on fait maintenant la thérapie génique c'est parce que on a bien étudié les gènes on connaît très bien les gènes on connaît très bien leur fonctionnement et justement moi mon travail c'est le fonctionnement d'un gène dont on ne connaît pas grand chose encore . cela fait 20 ans depuis que l'on travaille dessus on ne sait pas justement avec des modèles naturels parce que là c'est des mutations qui existent a l'état naturel. on ne les a pas provoquées justement on essaye de comprendre comment fonctionne le gène dans le but mais je dirai beaucoup plus tard (peut être 15 ou 20 ans) de l'utiliser pour la thérapie génique et de guérir des enfants qui sont transfusés a longueur d'année…j'ai eu l'occasion personnellement d'approcher des enfants malades et quand tu les voit comme ça tu te dis si je me mettais au boulot 24/24 ça ne serait pas suffisant et il faut faire quelque chose parce que les enfants souffrent quand ils ne meurent pas et moi en tant que scientifique je suis partie avec l'idée de rendre service; je ne voulais pas faire de la recherche dans mon coin dans un labo pour trouver quelque chose de toutes les façons ça ne m'intéressait pas. Ce qui a motivé cette recherche, je voulais travailler sur les maladies génétiques pour soulager pour trouver un médicament pour amener une contribution concrète; Je ne voulais pas faire le chercheur dans son petit coin, je ne nie. pas leur importance je me dis que c'est important mais moi je ne me sens pas la vocation de le faire même si je sais que ce que je fais n'est pas utilisable tout de suite mais je me dis ça ne fait rien ça finira toujours par servir.

18. pensez vous qu'un article puisse être rejeter sur une base purement linguistique ?

Evidemment pourquoi faisons nous toutes ces acrobaties si l'aspect linguistique n'était pas tenu en considération ?.Mais dans notre cas, nous faisons tout pour ne pas en arriver là.

19. Etes vous découragé après un rejet ? Abandonnez vous l'idée de publier ?

Not concerned by the question

20. Sur quoi portent les commentaires des référés. Quels changements proposent ils ?

Tout cela dépend du type de revues auxquelles les articles sont soumis. Une revue bien cotée ne laisse rien passer. Déjà un promoteur comme le mien, il filtre le moindre détail avant d'arriver aux référés. J'ai recorrigé 07 fois mon article avec xxxx (corriger peut signifier un petit détail) scruter chaque lettre.

21. combien de fois en moyenne un article est réécris ?

Question already answered above

22. A quoi attribuez- vous le problème de la publication en Algérie?

La publication c'est un tout, une politique, une culture, un devoir, un plaisir… chez nous rien ne favorise cela. Pour un sujet aussi délicat je n'aurai jamais pu faire mes manip ici. C'est un environnement qui ne favorise en aucun cas la promotion de la recherche.

Ce n'est pas un probléme de langue ?

Bien plus que ça.

TRANSCRIPTION 03

Interviewee: R M.

Participant : **E**

Setting:lab ISN Université De Cne

1. Quelle est l'importance de la publication chez un chercheur scientifique?

La publication pour tout chercheur est un devoir. Nous devons rendre compte de qui se fait. En plus la publication est une condition s'il sagit d'une recherche dans le cadre su doctorat.

2. Comment l'idée de la publication est elle née chez vous?

Chez les scientifiques il y a généralement deux types de publication. Il y a des publications qui sont faites au fur et a mesure que nous avons des résultats et d'autres publications qui viennent après avoir fini la thèse ou le mémoire .celles qui viennent au fur et a mesure du travail on les appelle des comptes rendus. Ca serait sous forme de workshops .chaque semestre ou chaque année minimum on doit publier nos résultats et communiquer nos résultats .a travers ces workshops on communique avec toutes les autres parties du programme; il y a beaucoup de chercheurs qui travaillent sur ce programme, chacun est spécialisé dans une filière bien donnée ; on se réunit chaque année pendant la durée de cet accord programme et au cours de ces réunions chacun présente son travail ; le travail exposé sous forme de communication peut être publié .donc la publication se fait parallèlement a la recherche .généralement ces publications sont contenues dans des proceedings et non dans des revues spécialisées . Les proceedings sont généralement le résumé d'un travail fait pendant une année ou une année et demi; c'est les résultats que l'on expose dans des communications et qui seront consignés dans une revue ou un journal soit français ou autres .les proceedings sont généralement interne au noyau qui travaille .il y a les autre publications qui se font dans des revues

spécialisées avec des référées…quoique dans ces proceedings il y a également un comité de lecture , qui est un comité scientifique mais ce n'est pas aussi rigoureux …le proceeding n'a pas la même valeur que la publication.

Le deuxième volet dans les publications dites internationales ; faites obligatoirement en anglais. On les publie parce qu'elles contiennent des résultats originaux .le chercheur n'est pas obligé d'exposer son travail .il n'est plus guidé .il l'a fait lui même ; il publie pour lui même. La publication inter généralement elle prends plus de temps et contient obligatoirement des choses intéressantes et originales… .quand on débute dans la publication il est généralement recommandé de travailler avec quelqu'un du domaine , qui est connu ; qui a déjà publié dans le journal .pour nous il s'agit généralement de nos professeurs qui sont en France sinon c'est très rare pour que ça passe .en tant qu'étudiants nous avons essayé seuls mais ça ne passe pas .on soumet plusieurs fois mais ça ne passe pas .si vous publiez une fois cela peut vous donner des chances .

J'ai fait deux sortes de publications une concernant un travail que j'ai réalisé dans le cadre de la thèse de doctorat et l'autre pour mon magister .les deux ont paru en même temps car je n'avais pas la possibilité de publier dans le cadre de mon magister .bien sur en collaboration avec une université française à Lyon .en Algérie nous n'avons pas de soutien, nous ne sommes pas motivés et une publication , elle prends beaucoup de temps ; j'ai publié dans *phytochemistry* et cela m'a pris quatre ans pour être publié. On a fait le travail, on a soumis le manuscrit et il fallait compléter certaines analyses .on a du reprendre le travail à zéro. On a complété. Une fois complétée, la publication a été acceptée.

3. Pourquoi dites vous on ? Est-ce que les résultats à publier sont préalablement discutés?

Oui. Généralement avec le professeur et avec le groupe de travail ; c'est nous qui lui suggérons de publier si nous avons des résultats intéressants.

C'est lui qui guide le choix du journal parce qu'il a des connaissances approfondies ;il vous dit que ça peut passer dans ce journal ou tel autre ; parfois il connaît quelqu'un et peut aider dans ce sens là

Oui dans le cadre de l'unité de recherche du laboratoire dans lequel je travaillais.

4. Sur quelle base choisissez-vous le journal de la publication?

Cela dépend de votre spécialité *phytochemistry* , en biochimie végétale, est mondialement connue , elle est bien coté ;c'est d'ailleurs pour cela qu'on ne peut pas y entrer sans avoir quelqu'un de connu parmi les coauteurs

5. Avez-vous essayé de la soumettre à un journal BIEN quotété ?

Question answered previously.

6. Comment procédez vous pour rédiger votre article ?

Généralement on lit. Il existe une littérature, on s'imprègne de cette littérature pour que ça puisse passer le plus normalement du monde .on a certain critères a respecter. On lit ce qui est déjà publié dans la revue, on essaye de respecter les conventions. On pense d'abord au titre , on fait un petit résumé ,on détermine les mots clefs , ensuite on écrit l'introduction, le développement puis la conclusion

Pour rédiger généralement je le fais en français parce que ma thèse est en français, les résultats sont en français. La bibliographie on la trouve en anglais , on la traduit en français ;on l'écrit d'abord en Français et au fur et a mesure on le traduit Cette manière de faire est un peu lourde on aurait aimé l'écrire directement en anglais ça nous aurait évite pas mal de perte de temps mais on est obligé de passer par le français parce que personnellement je ne maîtrise pas l'anglais je comprends quand je lis, je le parle quand je prépare ma communication mais notre difficulté c'est de comprendre le parlé des anglophones lors des communications; c'est très difficile de comprendre un anglais quand il parle .

7. Comment aviez vous appris ?

Question answered in6.

8. Quelles sont les difficultés que vous rencontrez pour rédiger en Anglais?

Le problème c'est la publication en elle même, deuxièmement la traduction et troisièmement la correction

9. Quels types de difficultés rencontriez- vous lorsque vous rédigez en français?

Question answered in 6

10. Est ce que votre papier a été relu pour une correction linguistique? Qui fait vos corrections ?

Généralement ce sont les professeurs et les membres de l'équipe de recherche ; c'est facile dans le sens ou il faut voir comment c'est déjà publié .qu'est ce qui passe, qu'est ce qui ne passe pas .il y a un modèle a suivre : un titre, des mots clefs… un certain nombre d mots qu'il ne faut pas dépasser; il y a un schéma que l'on doit calquer sinon ça ne passe pas; si vous changer de schéma l'éditeur ne l'accepte pas.

11. Etes vous satisfait de cette correction?

Absolument .surtout lorsque c'est corrigé par un anglais.

12. est ce que le travail est présenté lors d'une conférence ?

La publication dans une revue vient après avoir discuté ses résultats lors des workshops et c'est parce que nous avions jugé que c'était intéressant que nous avions décidé de consigner ça dans une revue internationale que de les laisser dans des proceedings .la publication vient par la suite càd quand on juge qu'un travail est intéressant…

13. Quelle adresse de correspondance utilisez vous ? Est ce que cela a un sens pour vous ?

L'adresse a plutôt un sens pour le journal à qui vous adressez votre article. L'adresse d'un laboratoire connu déjà fera certainement passer la publication; l'adresse, comme le nom d'une personnalité scientifique contribuent a faire passer un article. Le nom fait également référence à une adresse. Généralement je mets l'adresse du laboratoire français où je travaille

14. Est ce qu'il y a une division des tâches quant a la rédaction de l'article ?

Généralement c'est celui qui est intéressé par la publication qui fait le plus gros travail ; la publication, c'est le résumé d'un travail qui est entrepris, c'est le thésard ou bien celui qui manipule, c'est lui qui va publier ses résultats et les autres viennent se greffer parce qu'ils ont corrigé , ils ont donné une idée, parce qu'ils vous ont aidé . En France, les ingénieurs de laboratoire qui vous préparent le matériel, qui vous aident, qui font certaines analyses a votre place .quand il s'agit d'analyses de routine ce sont eux qui le font a votre place, une fois que vous leur avez expliqué le topo…vous les mettez sur votre liste de coauteurs par exemple, celui là MRG? Je le mets parce qu'il a contribué à la réalisation du travail. Le professeur soit il vient en premier ou en dernier cela dépend.…Généralement le principal auteur c'est le premier; les autres sont des collaborateurs; le nom du professeur c'est l'étiquette ou le passe partout… si c'est toujours la même équipe vous allez publier rapidement.

15. Est ce que l'article a circulé entre les différents membres de l'équipe?

Tout le monde a contribué

16. Est ce que vous pensez qu'il a une part de subjectivité ou d'impartialité de la part des référées et des éditeurs dans leurs jugements ? D'abord parce que vous venez d'un endroit qui n'est pas connu, d'autre part parce que vous êtes un non anglophone?

Je n'ai pas connu ce problème personnellement parce que j'ai publié en France. Je suis passé inaperçu parce que j'étais déjà dans un groupe qui était déjà connu**.**

17. quels sont les critères d'évaluation d'un article ?

tout ce qui est exploit, tout ce qui est original …tout ce qui nouveau s'il est bien expliqué, s'il est bien conçu, il est accepté. C'est ça les principes de la revue. dans mon cas , l'article a été d'emblée accepté parce que c'était un travail que nous avions réalisé en Algérie .nous avions pu isolé des molécules nouvelles pour la littérature phytochimique. C'était trois molécules nouvelles… .c'était un exploit.…

Pour la deuxième publication, elle a été faite dans le cadre de mon cursus de thésard ,on a eu également des résultats intéressants on a travaillé en relation avec des généticiens .au fur et a mesure des analyses on s'est rendu compte qu'il y avait quelque chose de positif dans le travail .la aussi le choix de la revue est guidé par le travail .on a travaillé sur des molécules dans la revue *phytochimie* quant a *plant breedings* , elle concerne surtout la génétique … c'est pour cela qu'il faut cibler la revue ; chaque revue est spécialisée …

18. pensez vous qu'un article puisse être rejeté sur une base purement linguistique.

Personnellement je n'en suis pas si sur. On s'arrange toujours pour qu'il soit bien écrit même s'il est fait par d'autres.

19. Etes vous découragé après un rejet ? Abandonnez vous l'idée de publier.

Je n'ai pas connu cela. Mais c'est une situation que nous acceptons. On trouvera toujours une revue qui l'acceptera. Dans l'étape actuelle des choses il faut surtout publier.

20 Sur quoi portent les révisions. Quels changements proposent ils ?

Généralement c'est sur le fond ; ils vous demandent d'argumenter davantage d'expliquer telle méthode un peu plus… ou bien citer des références.

22. A quoi attribuez- vous le problème de la publication en Algérie?

La publication est menacée surtout que la formation à l'étranger est très limitée aujourd'hui. Pour publier il faut que quelqu'un ait déjà publié. Pour les générations futures, leur encadrement va se faire ici localement. Cette génération est déjà coupée du monde extérieur .Pour publier il faut de la connaissance.

23. Comment pensez vous que la situation peut être améliorée ?

Il faut réunir les ressources humaines et matérielles pour le développement de la recherche. Qui dit ressources matérielles dit L'apprentissage sérieux de la langue, les mise sur pied des structures de traduction, le développement de la coopération internationale etc.etc.

TRANSCRIPTION 04

Interviewee : D.K
Pseudo**:D**
Setting: ISN OFFICE
Time spent:

1. Quelle est l'importance de la publication chez un chercheur scientifique?

Un scientifique qui ne publie pas à mon avis est un scientifique qui est mort honnêtement. …Dans le domaine de l'amélioration des plantes c'est une science qui évolue très très vite ; quand on manipule et on ne publie pas c'est comme si on avait rien fait .donc on est obligé de publier .

2. Comment l'idée de la publication est elle née chez vous?

On part d'emblée avec l'idée de publier. nous abordons des sujets d'actualité ou il faut publier obligatoirement càd l'objectif, la finalité de la recherche c'est la publication dans notre domaine .on n'aborde pas des sujets au hasard, c'est des sujets ciblés qui aboutissent directement sur des publications.

3. Est-ce que les résultats que vous allez publier sont prealablement discutés?

Généralement il s'agit de collaboration, on ne part pas comme ça … c'est des collaborations surtout avec des étrangers et surtout que le terrain Algériens et mal connu càd on discute avec des collaborateurs étrangers. On leur que nous voulons faire cela et cela et ils nous encouragent .

Qu'entendez vous par collaborateur. Sur quelle base se fait la collaboration?

Le laboratoire c'est là où j'ai réalisé ma thèse d'état d'une part et a travers mes publications d'autres laboratoires m'ont connu, ils souhaitent

travailler avec moi sur le matériel Algérien ; ces collaborateurs sont espagnoles, italien etc. …

4. Sur quelle base choisissez vous le journal de la publication?

Ce sont des journaux spécialisés, par exemple dans mon domaine biochimie et amélioration des plantes. C'est des journaux déjà ciblés nous avons le journal de *journal of Cereal Science, Journal Of Cereal Chemistry, Journal Of Plant Breeding and TAG (Theoretical And Applied Genetics.)*il s'agit de journaux internationaux…les chercheurs qui ne publient pas dans ces journaux, leurs travaux n'ont pas de valeur.

5. Donc si je comprends bien vous visez le top dans vote spécialité ?

C'est toujours souhaitable d'atteindre le meilleur.

6. Comment procédez vous pour publier votre article en Anglais ?

Dans un premier temps on rédige l'article en français, on le soumet aux collaborateurs étrangers qui eux même désignent des interprètes et ce pour aller vite.

7. Etes vous satisfait de la traduction?

Généralement oui.

-Qui prends en charge les frais de traduction?

Les collaborateurs parce que on les associent avec nous dans la publication

8. Quelles difficultés rencontriez- vous en rédigeant en anglais?

Not concerned by the question.

9. Quelles difficultés rencontriez- vous lorsque vous rédigez en français

Peut être une question de temps Avec la traduction nous perdons beaucoup de temps.

10. Est ce que vos papiers sont relus pour une correction linguistique?

Dans la plupart du temps, je passe par un traducteur. Il s'agit plutôt d'une correction éditoriale qui se fait au niveau des services de la revue.

11. Etes vous satisfait par cette correction?

(No need for this question regarding the previous answers).

12. Est ce que vous pensez qu'il y a des préjugés par rapport aux auteurs non anglophones?

Je ne pense pas qu'il y a des préjugés; parce que au niveau des revues scientifiques c'est la valeur de l'article qui prime. ce qu'il juge c'est le contenu scientifique d'une part et d'autre part la forme compte pour beaucoup .si l'article n'est pas bien rédiger en Anglais il est rejeté.

-Justement. Ne pensez vous pas que là il s'agit d'un préjugé?

Quelque soit votre nationalité, il faut respecter les conventions du journal; si un article ne respecte pas ces conventions il est rejeté.

a) Utilisez vous des référés potentiels dans vos références bibliographiques ?

Pas du tout. Avant tout nous ne les connaissons pas. On ne les cible pas du tout.

b) Est ce que vos résultats sont présentés lors d'une conférence avant d'être publiés ?

Généralement c'est la tactique avant de publier … on ne se lance pas comme ça dans une publication les yeux fermés .on soumet cette idée a débat au niveau d'un colloque et ca dépend de l'écho , des questionnements des participants ça dépend de l'intéressement des participants du colloque la communication pour nous est une sorte de sondage et tous les chercheurs adoptent la même tactique .ils soumettent une idée au niveau d'un workshop, d'un colloque ou d'un séminaire et en fonction de cela ils développent leur publication

13. Est ce que l'adresse de correspondance a un sens pour la publication ?

Quand j'étais en France, j'étais à l'INRA je mettais mon adresse là bas .le travail est fait à l'INRA donc on est obligé de mettre cette adresse. mais une fois que j'ai terminé la thèse, jai fait des travaux en Algérie je mets mon institution, il n'y a pas de complexes…pour faire accepter une publication l'essentiel est d'associer.

14. Qui sont les auteurs ? Qu'a fait le premier pour être cité en premier? Est ce que l'ordre des nom a une certaine importance?

L'idée vient du premier auteur **,** le premier jet de la publication vient de lui ensuite les associés soient ils ont manipulés soit ils ont corrigés l'article , ils ont contribués a la confection de l'article .l'ordre des noms a un sens particulier, le premier……l'idée émane de lui les cela dépend de la contribution de chacun ;la contribution du deuxième est beaucoup plus importante que celle du troisième et ainsi de suite et par moment on associe des auteurs qui n'ont même pas contribué ;c'est fait exprès parce qu'il y a certain journaux qui sont réservés a des sommités mondiales et le fait d'associer un américain avec nous ça passe très vite. C'est le cas de L qui est Américain, comme il connaît G.B .pour pouvoir publier dans *Cereal chemistry,* une revue Américaine, il fallait l'associer sinon la publication ne serait pas passée quelque soit le niveau ; avec ce nom çà passe très vite ; il n'a rien fait avec nous mais on était obligés de l'associer.

15. Est ce que l'article a été lu par vos collègues avant de le soumettre?

Question answered in 14.

16. Pensez vous qu'il y a une part de subjectivité de la part des éditeurs et des référés dans leur jugement quand il s'agit de chercheurs venant de laboratoires qui ne sont pas connus ?

A mon avis oui parce que si un chercheur des pays du tiers monde soumet, quelque soit le niveau de la publication, il ne passera pas .il y a beaucoup de subjectivité. il faut qu'on associe obligatoirement des noms connus.

17. Sur quelle base l'article est évalué ?

Il y a des facteurs objectifs .Ce sont les normes scientifiques de l'evaluation. Mais il y a aussi d'autres critères que nous appelons subjectifs.

-Vous voulez dire une discrimination ?

Dans une certaine mesure.

18. pensez vous qu'un article puisse être rejeter sur une base purement linguistique ?

Cela serait bien possible mais je pense que c'est très rare. La publication qu'elle soit écrite en français ou en anglais, elle est d'abord soumise à des services spécialisés. Nous passons par des intermédiaires mais cela est dans notre intérêt.

Jusqu'à quel degré le problème linguistique représente t il un handicap pour vous?

C'est un réel handicap parce que aujourd'hui tous les colloques, les séminaires de niveau sont en Anglais Pour communiquer avec des chercheurs qui travaillent sur le même thème nous avons d'énormes difficultés. Si je connaissais l'anglais mieux que ça, peut être que j'avancerai beaucoup plus vite.

19. Etes -vous découragé après un rejet ? Abandonnez vous l'idée de publier ? Demandez vous des explications?

Non .alors là on ne cherche pas a comprendre du tout. On soumet l'article à un deuxième journal.

20. Sur quoi portent les revisions ?. Quels changements proposent ils ?

Ils demandent des informations sur la technique, ils demandent plus de précisions, pousser l'investigation sur un sujet particulier. Ou bien dans la discussion des résultats. Ils rajoutent des omissions

21. combien de fois l'article est réécris?

2 Fois

22. A quoi attribuez- vous le problème de la publication en Algérie?

Les choses sont entrain de changer. Nous manquions de moyens, beaucoup de choses sont encours pour que la situation s’améliore. L’acquis principal que nous avons aujourd’hui c’est un encadrement local qui peut prendre en charge les futurs chercheurs.

23. Comment pensez vous que la situation puisse être améliorée ?

Des cours donnés a l'université pourraient nous aider parce que ce qui nous manque c'est la communication; nous comprenons presque tout mais comment poser des questions, comment informer nous ne pouvons pas ;le parler pour nous est le plus dur nous lisons , nous nous débrouillons pour écrire, nous utilisons des logiciels etc., mais pour communiquer .c'est difficile

TRANSCRIPTION 05

Interviewee:. A.D

Setting: lab

Pseudo: **B**

1. Quelle est l'importance de la publication chez un chercheur scientifique?

On ne peut pas concevoir une recherche sans publication. C'est un aboutissement de tant d'efforts. C'est une continuité de la recherche. Ceci sans parler des avantages à un niveau personnel.

2. Comment l'idée de publication est-elle née chez vous ?

La publication vient souvent juste après des résultats qu'on obtient. On les juge sur leurs valeurs scientifiques par rapport au sujet et par rapport à l'environnement dans lequel se situe le travail. Si les résultats sont assez pertinents, ils peuvent faire l'objet d'une publication. Leur solidité est souvent liée au protocole expérimental.

3. Est-ce que les résultats à publier sont préalablement discutés?

Personnellement, maintenant, je suis arrivé a un stade où je suis juge de la question. Si le travail rentre dans le cadre d'un magister ou d'un doctorat, le jury suggère sa publication. en ce qui me concerne et dans le domaine dans lequel j'évolue, j'ai comme même assez d'appréhensions, de perceptions sur la valeur des choses

4. Sur quelle base choisissez vous le journal de la publication

Le journal généralement on le choisit en fonction du contexte dans lequel est réalisé le travail. On choisit aussi par rapport à la spécialité de la revue et bien sur on cible la revue où on a le maximum de chances pour que notre travail soit publié

5. Avez-vous essayé de soumettre votre article à un journal top ?

Pour le moment on ne peut pas parler de Top. On essaye de voir a quel niveau on peut placer le travail. On n'est pas arrivé au stade de résultats "tels" pour cibler la plus élevée. On fait de la formation par la recherche ce n'est pas un laboratoire qui fonctionne avec force de production de résultats assez importants et qu'on peut a partir d'un résultat donné ou a partir de remarques données qu'on peut suggérer ou reprendre certaines études qui existent dans la matière mais bien sur il y a toujours cette condition d'aller au delà. Pour arriver a ces revues là il faut être parrainé, il faut être membre associé ou a la limite être avec quelqu'un qui a l'habitude de publier dans ces revues.

6. Comment procédez-vous pour rédiger votre article?

La rédaction se fait d'abord en français et puis au fur et à mesure on écrit soit des termes soient des phrases en anglais pour que la traduction du français à l'anglais soit facile pour le traducteur. Ou bien on fait appel à des collègues, avec qui nous travaillons; aptes à rédiger un article en anglais et avec lesquels on travaille en collaboration en leur suggérant des termes des phrases

-Est ce que vous travaillez ensemble ou bien vous les laisser faire?

On les laisse d'abord faire, ensuite on reprend toujours la traduction pour voir si la traduction n'a pas fait perdre a l'article son sens.

8. Quelles difficultés rencontrez- vous dans la rédaction d'un article ?

Le premier handicap c'est la maîtrise de la langue ensuite c'est l'environnement. Nous n'avons pas de moyens pour concevoir un article cohérent linguistiquement nous n'avons pas assez de moyens pour nous faciliter l'acquisition de la langue et comment rédiger un document scientifique

9. Quels types de difficultés rencontriez- vous lorsque vous rédigez en français?

C’est bien sur tomber sur le bon traducteur. C’est ne pas perdre de temps pour soumettre l’article.

10. Est ce que votre papier a été revu pour une correction linguistique?

Oui je consulte toujours quelqu'un ; souvent un enseignant du département d'anglais

11. Etes vous satisfait de cette correction?

Sa contribution est importante; sa contribution apporte des changements .surtout au niveau de la grammaire. Il y a comme même un acquis la dessus.

12. Il est souvent dit que l’entrée dans le monde de la publication scientifique est difficile. Prenez vous certaines précautions pour faciliter cette entrée ? Par exemple, Aviez vous essayé d'inclure dans vos références des "éventuels" référées?

Oui; sachant que dans certaines revues, il y a tel ou tel membres de l'editorial board, nous les incluons leurs travaux.

-Aviez vous présenté votre article lors d'une conférence avant de le soumettre a publication

Nous les présentons pour tester la portée de nos résultats. D'abord ce sont les conférences; ensuite c'est l'agressivité propre a la personne .je présente ce que je suis entrain de faire, ensuite je tisse des connaissances

13. Quelle adresse de correspondance utilisez vous est ce que cela a un sens pour vous?

J'utilise l'adresse de l'université de Constantine

-Est ce que cela ne porte pas préjudice?

Ça peut porter préjudice sachant que cette institution n'a pas de traditions de recherche, mais souvent cet handicap est caché par le nom d'un

collègue avec qui on travaille .le fait de mettre un nom connu c'est souvent pour aider quelqu'un .ça a un sens parce que ça donne plus de crédibilité au travail. C'est un soutien scientifique.

14. Qui sont les co-auteurs ? Qu'a fait le premier pour être cité en premier? Est ce que l'ordre des nom a une certaine importance?

a)Il y a une division des taches quant a la rédaction de l'article ?qui fait quoi? Il y a celui qui a contribué matériellement, qui nous a aide quant a la réalisation de l'expérimentation. Il nous a permis d'accéder au Lab. , d'utiliser les moyens du Lab. . il y celui qui manipule en fin de compte. il y aussi qui dirige la question le responsable .il a un apport quant a l'orientation, la conception de l'expérimentation un co autheur c'est aussi l'engagement scientifique de quelqu'un.

b) Comment expliquer vous l'ordre des noms dans un articles?

Celui qui est a l'origine de la publication, c'est lui le pivot central de la question le premier est l'axe central de la réalisation de l'article, le suivant celui qui repris les choses (c'était mon encadreur). Le travail a été traduit par un professionnel.

15. Est ce que l'article a été lu par vos collègues avant de le soumettre?

Oui bien sur.

16. Pensez vous qu'il y a une part de subjectivité dans les jugement des référés? Parce que vous êtes non anglophone et vous venez d'un pays du tiers monde

Etre non anglophone; ils ne le savent pas.…Ce qui importe pour eux c'est l'environnement de recherche, la fiabilité du travail, ce que nous citons comme travaux.

17. Sur quels critères un article est-il jugé ?

Sur des critères purement scientifiques.

18. Pensez vous qu'un article puisse être rejeté sur une base purement linguistique ?

C'est très rare. On juge surtout la qualité scientifique. Mais on ne peu pas négliger cet aspect.

19. Etes vous découragé après un rejet ? Abandonnez vous l'idée de publier ?

Pas à notre niveau. Souvent on revoit ce qui ne va pas et on re –soumet a d'autres revues.

20. Sur quoi portent les révisions. Quels changements proposent ils en cas d'acceptation?

Généralement c'est améliorer la discussion, mieux discuter les résultats en s'appuyant sur d'autres références bibliographiques .souvent c'est le référé lui même qui veut que son travail soit cité .d'autres fois c'est pour mieux clarifier d'autres points.

-Vous a t-on fait des commentaires sur la langue?

Non très peu

-vous arrive il de ne pas être d'accord avec les changements qu'ils proposent ? Que faites vous ?

On rectifie et on répond à la demande, on essaye de justifier notre démarche. Pour que notre article soit publié, il faut procéder par manière diplomatique, par tact.

21. combien de fois en moyenne un article est réécris

2 fois voire trois.

22. A quoi attribuez- vous le problème de la publication en Algérie?

S'il y a une insuffisance, elle n'est pas du a un manque de compétences. C'est l'environnement de recherche qui fait défaut. Pourquoi sommes nous aptes a produire ailleurs et pas ici ? La recherche a peu de place dans la politique Algérienne ; la recherche n'est pas encore une priorité

23. Comment pensez vous que la situation puisse être améliorée ?

A une échelle nationale il faut une politique de recherche, des objectifs et des moyens. A une échelle locale il faut un minimum. Je pense que dans un laboratoire qui se respecte, où il y a des résultats publiables il faut qu'il y ait au moins quelqu'un qui puisse faire ce travail; ça facilite énormément la tache surtout quand on a pas cette maîtrise de la langue; quelque soit notre niveau scientifique notre valeur est méconnue quand on a pas la langue de communication .il faut qu'il y est quelqu'un qui nous aide sur ce plan là.

TRANSCRIPTION 06

i. Date 23/ 12/97

Interviewee : NK

Pseuco **: C**

Setting:ISN LAB

1. Quelle est l'importance de la publication chez un chercheur scientifique?

Quand on entame une recherche, on sait qu'au bout c'est la publication. c'est suite une logique…sinon il n'y a pas lieu de faire de la recherche Si c'est pour garder ses résultats et ne pas les publier surtout sur le plan international si tu ne publie pas tout de suite ce que tu as çà y est tu es largué parce que d'autres vont publier ce que peut être tu as fait et toi tu n'auras plus l'originalité et a ce moment là … il n'y a plus de raison de publier …et puis en même temps puisque on fait une thèse , la thèse est obligatoirement sanctionnée par une publication pour soutenir. donc il y avait aussi cette contrainte

2. Comment l'idée de publication est elle née chez vous?

Comme je viens de le souligner, à partir moment ou vous avez des resultats et de surcroît quand ils sont intéressants et originaux on pense à la publication.

3. Est-ce que les résultats a publier sont préalablement discutés?

Dans mon cas, lors de mes premières expériences, j'ai donné d'abord une espèce de brouillon en Français à mon encadreur, avec toutes mes idées. L'encadreur a lu puis elle me remet en me disant que ça il ne faut pas, ça il le faut. Cette idée il faut l'améliorer… Après cela on reprends, je lui redonne et une fois que l'on tombe d'accord, elle intervient avec sa correction parce qu'elle va être portée dans la publication. Elle aussi elle apporte quelque chose, elle affine la rédaction, elle précise la pensée, elle

commente un peu plus un résultat si toutefois, moi il m'a échappé .Souvent, quand on est débutant on pense que tout est logique que tout est simple alors par exemple on mets des résultats qui ne sont pas bien expliquer. Alors elle est là pour rectifier le tir. là tu n'explique pas suffisamment, là ce n'était pas la peine

4. Sur quelle base choisissez vous le journal de la publication?

D'abord selon le contenu pour choisir une revue qui… a des publications qui tournent autour de même spécialité ensuite il faut qu'elle soit de renommée internationale. Une bonne revue il ne faut pas que ça soit … en France, on ne publie pas dans des revues Françaises par exemple .les sociétés Françaises de botanique de microbiologie sont mal cotées donc c'est obligatoirement en dehors des françaises

5. Avez-vous essayé de soumettre votre article à un journal top ?

On essaye de la soumettre à une revue bien cotée, mais si elle est refusée parce qu'elle ne répond pas à leurs normes …on choisit une un peu moins cotée. En l'occurrence celle de *Cariologia* …. Nous avions ciblé une revue beaucoup plus importante, on a eu un refus.…On s'est douté un peu parce que on travaillait sur un sujet sur lequel travaillaient beaucoup d'Indiens. C'était pratiquement leur chasse gardée et l'un de nos référés était l'un de ces Indiens là. On a alors compris qu'on ne doit pas marcher sur certaines bandes .Ce référé a donne une appréciation négative pour la publication dans cette revue. On a eu un rejet .Quand ils l'on renvoyée, on a compris surtout après avoir lu le nom des référés. Nous avions compris que cette personne avait la paternité de ce thème .Ainsi on s'est retourné sur une autre revue qui est *Cariologia*

a) Aviez vous essayé d'inclure les travaux de ce référé dans votre publication?

Ah oui! Bien sur il a travaillé sur le même sujet il a obtenu des résultats qu'on a utilisés donc on le mentionne dans la biblio; mais comme nous on venait après lui dans le temps chronologiquement**,** on s'est douté on s'est

certainement dit que c'est pour cette raison .On s'est donc retourné vers *Cariologia* qui a accepté tout de suite.

b) Est ce que l'idée de publier dans un certain journal émane de vous ou bien vient elle de toute l'équipe?

C'est le directeur de recherche .parce que lui il a déjà son idée derrière la tête; il a son expérience, il a déjà publié avant nous il sait que quand on est nouveau, quand on tombe comme ça dans une revue on a peu de chance d'être publié c'est pour cela que dans un groupe il faut mettre une sommité ; souvent c'est le dernier le plus important : le patron, le directeur de recherche ; c'est celui que la revue connaît .le plus important du point de vu aura scientifique pas du point de vue recherche

6. Comment procédez- vous pour rédiger votre article?

d'abord en français, nous ne l'écrivons pas directement en Anglais et une fois qu'il est bon ,on le passe à la traduction .Pour ***Cariologia***, j'avais essayé de traduire toute seule. J'étais là, ici, j'ai traduit et je l'ai donne a une collègue biologiste anglophone. On a travaillé ensemble pour me faire la traduction ;je l'ai envoyé mais on m'a dit que la traduction n'était pas bonne, je l'ai envoyé a Orsay et là bas ils ont un autre système de traducteurs spécialises qui se font payés par nombres de pages ou bien ils procèdent eux mêmes à la traduction. Ils ont toujours un parmi eux qui est anglophone , qui a été en Angleterre ou qui a fait des tas de stages, qui s'est vraiment imprégné …qui sait vraiment traduire, on lui donne et lui il corrige

-Que pensez vous de ce système?

C'est le système D. il n'y a pas mieux que de connaître l'anglais soi même.… parfois comme c'est de l'anglais scientifique et déjà que le patron a beaucoup de publications quelque fois par exemple pour matériels et méthodes c'est les mêmes phrases stéréotypes qui reviennent , alors on les reprends , alors on a réglé notre problème pour cette section on s'est que c'est bon

-Et pour la discussion?

La discussion c'est là où on nous reproche des choses…

7. Comment aviez vous appris à rédiger en Anglais ?

Not concerned by the question.

8. Quelles sont les difficultés que vous rencontrez dans la publication en Anglais?

D'abord c'est l'anglais, les raisons que j'ai invoquées tout à l'heure… Si je maîtrisais la langue, la publication ne mettra pas autant de temps à être envoyée; Ne pas connaître l'anglais c'est un frein terrible. Nous perdons énormément de temps avec la traduction

9.10.11 all the questions related to the linguistic revisions did not find answer

12. Il est souvent dit que l'entrée dans le monde de la publication scientifique est difficile. Prenez vous certaines précautions pour faciliter cette entrée ? Par exemple,

a) Aviez vous essayé d'inclure dans vos références des "éventuels" référées?

On ne les connaît pas… on reste fidèle aux exigences de la revue chaque revue à sa manière de présenter ses résultats , la manière de les passer …on essaye de rester fidèles, c'est beaucoup plus la forme là que le fond la forme, il faut que ce soit la forme de la revue**.**

b) -Aviez vous présenté votre article lors d'une conférence avant de le soumettre a publication

Pas toujours. S il y a un congrès avec communication on présente une partie de notre travail

13. Quelle adresse de correspondance utilisez vous? Est ce que cela a un sens ?

Pour la première j'ai utilisé l'adresse de France parce que le premier sens c'est que j'avais peur de perdre mon courrier, j'avais peur qu'il n'arrive pas. je préfère que tout arrive chez eux à Orsay ensuite comme je m'attendais a ce l'on fasse des remarques j'ai préféré que ça soit Orsay qui réponde à ces remarques; style corriger l'anglais ceci cela… c'est eux qui ont pris en charge la traduction, j'ai préféré les laisser faire pour la correction et tout. pour aller jusqu'au bout. troisième raison le laboratoire est plus fiable .ici on m'envoie comme correspondant principal, il ne me connaissent pas ; il ne connaissent pas le labo; peut être que ça serait un peu gênant.… On est un petit peu complexé en quelques sortes on a peur on se dit c'est un paravent il vaut mieux pour nous. Par contre celle de chimie, mes collègues chimistes ont déjà publié dans *phytochemistry;* ils sont connus ; ils ont tout pris en charge. Tout c'est fait d'ici …

14. Qui sont les auteurs ? Qu'a fait le premier pour être cité en premier? Est ce que l'ordre des nom a une certaine importance ? Que signifie travailler en équipe ?

Parce que d'abord sur un thème généralement on est plusieurs. On travaille en équipe parce que on est obligé de travailler en équipe. Le fait par exemple, si on travaille sur une plante, on la découpe sur plusieurs thèmes et chacun prend une partie. Chacun la fignole, la triture tout seul. Mais c'est une plante c'est un tout alors donc le fait de travailler sur un tout mais en divisant le travail. Mais on doit se retrouver après au niveau de la publication. Moi le travail personnel que j'ai fait, je mets la personne qui a travaillé avec moi. Mais qui n'a pas travaillé sur mon sujet exact mais elle; elle va me mettre aussi. a Orsay par exemple c'était l'équipe millet on travaillait sur le millet on était une dizaine peut être .J'ai 2 publications sur ce thème. quand je suis en tête, c'est mon boulot, Mais j'ai intégré la directrice et les deux ou trois autres qui ont publié avec moi.…Vous voyez ici par exemple, Lxxxx , c'est une vietnamienne, c'est

son travail mais elle avait utilisé en partie mes résultats - en partie - de ce que j'avais obtenu ici donc elle m'a mise dans sa publication.

-Est-ce que c'est une pratique courante ?

Ah oui, elle fait partie de l'équipe du laboratoire. Généralement quand ils sont en équipe s'ils publient c'est pour s'épauler, pour avoir un bon CV ils se mettent entre eux càd je te mets et tu me mets… ça c'est pratiqué mais en étant en équipe.

a) est ce l'ordre des noms à une certaine importance?

Généralement le premier est le plus important, le dernier c'est le patron.

b) Est ce qu'il y a une répartition des tâches pour la rédaction de l'article ?

le premier jet, comme dans ma publication, c'est moi qui l'ai fait et après ça a été corrigé.… On récupère ce qui a été rédigé quelque part, on sait que ca devient des phrases passe partout mais dans la discussion et la conclusion c'est la personne qui va être en tête généralement, c'est celle qui a la charge de la publication et ensuite elle fait corriger .Je ne sais pas si on doit considérer cela comme une sorte du division du travail?

15. Est ce le manuscrit circule entre les membres de l'équipe une fois terminé?

Non ça reste entre le patron et le premier auteur de la publication sauf si nous avons un collègue assez fort en Anglais, on lui passe pour révision et il le corrige

16. Pensez vous qu'il y a une part des subjectivité de la part des référés et de l'éditeur dans leur commentaires ?

Le premier cas que j'ai cité tout a l'heure, c'est un cas de subjectivité parce que c'était le sujet qui était leur propriété privée.

Et en tant que non anglophone?

Généralement on ne le sent pas. Mais pour eux c'est toujours anglais pauvre, anglais pauvre…Mais je ne pense pas qu'il y est préjugé parce qu'on finit toujours par publier. Je n'ai pas le sentiment que certaines revues sont la chasse gardée de certain pays.

17. Sur quels critères l'article est évalué ?

Ils ne jugent sur un certain nombre de critéres scientifique. Le suet est aussi important. Souvent ils veulent un sujet porteur parce que il faut qu'il soit lu par un grand nombre de lecteurs. les revues sont cotées en fonction du nombre de leurs lecteurs. s'il pensent que le sujet ne va pas être lu par la communauté internationale; qu'il n'apporte rien à la communauté internationale ils le refusent il faut que ça soit vraiment un sujet dont ils sont sures qu'il va bien circulé. Un article est rejeté s'il n'est pas conforme à l'esprit de la revue

18. Pensez vous qu'un article puisse être rejeté sur une base purement linguistique ?

Il y a toujours quelqu'un qui est plus sévère que l'autre .il y a toujours un qui est là pour couper le cheveu en quatre .sur la forme ils y a certains qui sont souvent très exigeants. Cela peut parfois arriver.

19. Etes vous découragé après un rejet ? Abandonnez vous l'idée de publier ?

Jamais. On tente des revues bien cotées, si toutefois ça marche ; mais on sait pertinemment que l'on risque le rejet. Si c'est le cas on soumet a une autre revue.

20. Sur quoi portent les révisions. Quels changements proposent ils en cas d'acceptation ?

A la fois sur la qualité de l'anglais si celui-ci n'est pas passé par un service spécialisé, sur le style du journal s'il n'est pas conforme aux conventions. Et bien évidemment, sur le moindre détail scientifique.

21. Combien de fois réécrivez vous votre article?

2 fois

22. A quoi attribuez- vous le problème de la publication en Algérie?

Je crois qu'il y a un peu de tout. La langue oui. Mais aussi l'environnement. Nous n'avons pas les moyens qu'il faut. On reste toujours dépendants.

23. Comment pensez vous que la situation puisse être améliorée ?

Pour moi avant tout il faut apprendre l'anglais. Il faut suivre des cors très sérieux. Ailleurs ils engagent des anglais mais là la situation ne nous le permet pas. Il faut trouver des solutions.

TRANSCRIPTION 07

Interviewee: B.H

Pseudo: **A**

Setting: ISN

1. **Quelle est l'importance de la publication chez un chercheur scientifique?**

   L'importance est double: quand on a fait un travail de recherche dans un domaine donné, on est au courant de tout ce qui se fait dans ce domaine et de tout ce qui s'est fait… et quand on est conscient d'avoir apporté quelque chose de nouveau à ce domaine et bien la motivation c'est de contribuer à faire avancer les choses dans ce domaine là. Donc le premier moteur c'est celui là. Le deuxième moteur c'est un problème de carrière. La carrière à l'université avance a coups de publications, il est évident que c'est un déterminant important

2. Comment l'idée de publication est elle née chez vous ?

là ce n'est pas compliqué ; a partir du moment où tu es dans un système parce qu'il faut se dire quand tu fais de la recherche dans un domaine donné, tu es un petit peu au courant de tout ce que font les équipes qui bossent soit sur ton problème spécifique soit sur des problèmes périphériques mais qui t'intéressent et donc a tout moment tu peux évaluer qu'est ce qui peut dans ton travail apporter un plus au débat général auquel tout le monde contribue . donc tu estimes ça comme une contribution de ta part et a partir du moment où tu juges que tu es arrivé a une qui peut être intéressante pour les autres tu te lances dans le domaine de la publication.

3. Sur quelle base choisissez vous votre journal de publication ?

Cela aussi n'est pas compliqué. Quand tu fais de la recherche dans un domaine donné tu sais évaluer ton travail et celui des autres et tu sais aussi la valeur de chaque publication de part son renom .du coup en fonction de ce que tu as fait tu sais pertinemment a quelle revue tu peux prétendre et c'est ce que je fais personnellement. J'essaye de marier les deux de faire dans la durée par exemple en une année un article de très haut niveau et de le faire passer dans une très grande revue et ce que j'estime d'un niveau inférieur je le fais placer dans des revues de moindre renom ……je cible la revue en lui proposant un travail de son niveau a elle le choix de la revue est toujours subjectif et personnel. Je lis pas mal ces revues là donc j'ai une idée sur le niveau de chacune d'elles particulièrement dans mon domaine.

Pour ma première expérience, je n'ai pas été guidé.… je l'ai tout de suite faite dans mon domaine parce que à l'époque j'avais fait un travail que j'avais estimé intéressant donc j'avais rédigé un papier et je l'ai proposé a mon patron lui demandant de le proposer a la revue " *infection immunity* " que j'avais moi même ciblée (C'était une très grande revue a l'époque, dans la microbiologie de l'infection, c'était le top du top a l'époque). Le patron était d'accord donc depuis je suis resté sur le même système…il y a des revues où tu es bien content de placer un papier pendant toute ta vie ;et donc c'est une référence que de publier dans ces revues ci . depuis que je suis rentré en Algérie je n'ai jamais pu replacer un article dans cette revue parce que j'ai estimé que la qualité du travail que je fais ici n'est plus la même. je continue toujours a publier dans des revues de très grand renoms mais d'un niveau plus bas que la première

6. Comment procéder vous pour rédiger votre article ?

D'abord la rédaction d'un article obéit à des règles; d'abord à des règles générales… ces règles je les ai acquises par la lecture. a force de lire . a coté de ces règles chaque revue a des critères spécifiques de publication .il en a qui présentent un plan. Il en a qui présentent des critères de quantité de pages etc.… personnellement je rédige en tenant compte des

règles générales de la rédaction de l'article. Donc pour moi le principal déterminant de la rédaction d'un l'article c'est un certain nombre de résultats. Quand je juge qu'il a suffisamment de résultats pour écrire un article (sans penser a la revue) je rédige l'article selon les règles générales… directement en Anglais (càd. dans mon anglais à moi) ensuite compte tenu du contexte etc. je commence par la suite a réfléchir à quelle revue je peux le proposer. Une fois que j'arrête le nom de la revue à laquelle je vais le soumettre là je le mets aux conditions de cette revue là .et une fois je l'ai mis aux conditions de la revue , je le revoie dans sa rédaction etc. je le présente a quelqu'un de l'anglais, un ami un collègue…pour essayer de le mettre en conformité au point de vue de la langue.

a)Est que vos coauteurs ont contribué à la rédaction?

Alors là non…Dans tout ce que j'ai publié, au niveau de la rédaction personne n'a jamais collaborer avec moi …en-dehors de l'aspect de la correction de l'article une fois rédigé.

b) Est ce qu'ils contribuent a la correction?

Même pas.…J'ai toujours pris en charge tout seul cet aspect de publication. D'abord je n'ai publié comme premier auteur a ce jour que du travail que j'ai fait et dont je suis vraiment l'auteur et l'auteur principal. Parce qu'il a beaucoup de contestations dans cette histoire de : premier, second auteur etc. et je n'ai jamais demandé rien a personne pour cette histoire de auteur et coauteur. je me suis toujours d'autorité mis premier auteur quand j'ai jugé que j'étais l'auteur principal dans un travail donné. j'ai mis sans jamais demandé a personne les coauteurs parce que j'avais estimé qu'ils avaient collaboré a ce travail et je les ai toujours mis dans l'ordre que j'ai jugé le plus approprié. Je n'ai jamais rien demandé a personne.

7. Associer vous dans vos publications des noms connus ?

Jamais.…j'ai si tu veux quelques papiers où des gens extrêmement connus sont associé mais ils sont associé non pas à cause de leur noms mais parce que vraiment à un titre ou a un autre ils ont participé a ce travail là. Ils ont effectivement contribués par exemple sur deux ou trois papiers j'ai avec moi deux ou trois chefs de service de l'institut Pasteur de Paris qui sont avec moi dans la publication c'est parce que une partie au moins de ce travail a été réalisée dans leur services mais ce n'est pas parce qu'ils s'appellent x ou y qu'ils sont dans mon papier

8. Quels sont les difficultés que vous avez rencontrées en rédigeant en Anglais difficultés aviez vous rencontrés en rédigeant en Anglais?

Franchement …Pour moi la principale difficulté que j'ai rencontrée en rédigeant en Anglais c'est une fois l'article rédigé de me dire est ce que c'est vraiment correct ou pas. C'est la seule question que je me pose.

9. Comment expliquer vous que dans les commentaires que vous recevez de vos référées c'est toujours le problème de la langue qui revient ?

oui souvent on me fait remarquer qu'il faut revoir la langue entièrement… Je viens de soumettre un papier dernièrement, on vient de me répondre en me disant que le papier était très intéressant mais présenté dans une langue peu compréhensible… mais le type a quand même compris. Donc j'ai toujours cette difficulté. Mais j'ai l'impression avec un anglophone qui serait d'essence littéraire etc. on ne parle pas du tout le même langage…je suis persuadé au fond de moi même que si je rédigeais un papier avec lui ça serait au moins aussi incompréhensible que le mien et donc ça ne règle pas le problème a mes yeux.

…je pense en français, ça c'est clair et j'essaye donc de la traduire en Anglais. Mais ce n'est pas tout a fait cela comme même parce que je la traduis en anglais compte tenu comme même de tout ce que j'ai lu et l'essentiel de ce que je lis est en anglais. donc dans l'anglais que j'utilise, je pense que le poids des mots y est. c'est les mots qu'il faut mais ils ne

sont pas utilisés dans le bon ordre, dans la bonne tournure etc. des tournures très alambiquées

10 Que pensez vous de la révision linguistique faites par vos collègues anglophones ?

Je n'ai jamais été satisfait. Jamais… je dis bien jamais …parce que quand je revois avec quelqu'un une copie, il transforme un certain nombre de choses qui, au passage pour moi perdent le sens que je voulais leur donner du moins. ça c'est un gros problème.

12. Comment pensez vous qu'on pourrait améliorer la situation?

Créer un centre spécialisé. Dans tous les centres de recherche en France ça existe… Moi j'ai bossé dans un centre de recherche en France où tu écrivais un papier en anglais ou en français, dans la langue que tu voulais .Ils avaient un service de traduction spécialisé. Donc on te donnait rendez vous et tu allais travailler avec la personne qu'on te désignait autant de fois qu'il fallait jusqu'à ce que l'un et l'autre soient satisfaits de la copie .C'est ça qu'il faut faire ici..

13. Vous ne voyez bien sur pas la solution a un niveau individuel ?

Çà c'est l'idéal a condition de vouloir payer le prix de la formation . mais arrivé à notre âge c'est un peu difficile parce qu'il faut avoir une sacrée motivation pour se remettre à étudier…du moins dans mon cas … moi j'ai toujours très vivement souhaité maîtriser suffisamment l'anglais…J'ai bien évidemment entendu parler des cours etc. j'ai même assisté à des cours une ou deux fois mais c'était exactement la répétition de ce que je faisais au lycée ,au collège etc. donc si c'était efficace au lycée et au collège je ne vois pas pourquoi il faudra que je refasse cela vingt ans plus tard. ce sont donc les méthodes qu'on appliquait qui ne m'avaient pas plus du tout ….Moi je pense que ce n'est pas compliqué en fait il faut plongé quelqu'un dans un univers anglophone dans son domaine pendant le temps qu'il faut - six mois ou une année - et je crois que ca peut lui rapporter beaucoup plus que des cours pendant dix ans . je pense c'est ce

qu'il faut faire. Mais ce que propose l'institut d'anglais c'est à dire ces espèces de cours où les gens se retrouvent de manière très nonchalante … ne sont d'aucun apport.

14. Est-ce que l'ordre des noms aune certaine importance dans vos articles ?

L'ordre que j'adopte c'est le suivant: (c'est une question d'école là aussi. Chacun a sa petite méthode derrière la tête.).chaque méthode est un peu plus juste à la mesure de celui qui l'applique. Ce que je fais personnellement ; je l'applique même ici dans mon labo maintenant. si tu veux .moi j'estime que le principal auteur du travail c'est celui qui la réalisé bien que celui qui la réalisé n'est pas toujours la source de l'idée…et dans la recherche l'idée c'est le principal parce que a mon avis lorsque tu as l'idée le protocole opératoire à la limite n'importe quelle personne peut appliquer ce travail là et obtenir les résultats que tu publies. donc l'idée est vraiment l'essentiel. Mais l'autre problème quand tu as des thésards dans le Lab.; les conditions en Algérie ils sont rarement la source de l'idée. Ce qui n'est pas le cas à l'étranger. A l'étranger nous avons été formé a une époque e dans des labo fait que on est la source .la source conceptuelle et tu as en même temps l'instrument de réalisation qui n'est pas le cas ici chez nous. Chez nous souvent le thésard est l'instrument de réalisation et non pas la source de conceptualisation. Et çà ca pose un très gros problème au niveau de la formation parce que ces gens sont censés être formé pour conceptualiser.

15. Pensez vous que l'adresse de correspondance que vous mettez puisse avoir une influence quelconque sur l'acceptation ou le rejet de l'article ?

Certainement… il est clair que c'est un handicap… il est clair qu'un travail qui est effectué à l'université de Constantine est a priori mal considéré .d'ailleurs je ne te cache pas que nous avons beaucoup , beaucoup de mal a faire passer un travail exclusivement réalisé a l'université de Constantine.

-Que faites vous dans ces cas ?

Je persiste. Dans ces cas là on se met a publier un travail de valeur dans des revues qui ne lui correspondent pas .déjà que le background scientifique du pays n'est pas brillant quand on leur propose un travail qui vient de ce pays ,ils ont raison d'être soupçonneux et d'être prudents.…je ne les blâme pas mais je me contente de payer les pots cassés.

-Est ce que le travail est présenté dans une conférence avant d'être publié?

Systématiquement. Je fais ça pour plusieurs raisons : déjà quand tu présentes un travail dans un congrès international, tu l'évalue en fonction de l'audience qu'il va avoir. Deuxièmement dans un laboratoire tu n'existes pas seulement a travers les publications, tu existes bien plus a travers toutes les participations aux congrès internationaux que tu fais.

-N'utilisez vous pas cela comme stratégie pour faire accepter votre article ?

Non… enfin je ne serais pas aussi catégorique parce que souvent si tu veux les gens qui font partie des comités de lecture des principales revues d'un secteur donné sont aussi les organisateurs ou les évaluateurs de ces congrès là. Et donc bien sur s'ils entendent parler de toi ; de ton travail dans un congrès par la suite si ton travail aboutit pour son évaluation sur leur bureau il est évident que c'est un plus pour toi.

-Essayer vous d'inclure dans vos références des potentiels référés?

Non**.** C'est parce que par définition les référés tu ne les connais pas. Parce que ce n'est pas l'editorial board qui évalue.…tu ne peux pas savoir si quelqu'un va t'expertiser ton boulot ou pas.

16. pensez vous que cette subjectivité peut être liée au fait que vous soyez non anglophone ?

Oh oui !ça c'est tout a fait clair. …

17. D’après vous quels sont les critères d'évaluation d'un manuscrit?

D'après moi, ils sont très subjectifs parce que sur tous les commentaires que j'ai reçu ; sur tous les papiers que j'ai sortis; sur tous les papiers qui m'ont été refusés …sur tous ceux qui sont en cours j'ai rarement reçu un commentaire de quelqu'un qui a réellement compris ce que j'ai proposé dans tout son ensemble. C’est extrêmement rare.

-A quoi attribuer vous cela ?

J’attribue cette subjectivité au fait qu'ils proposent pour évaluation a des référés des papiers qui ne les concernent pas directement .si tu veux on envoie à quelqu'un parce que c'est une personnalité connue en microbiologie mais les différents domaines de la microbiologie sont énormes et personne n'est capable d'évaluer tout ce qui sort en microbiologie. Donc pour eux surtout pour les plus grosses cylindrés parmi les revues je pense qu'ils proposent pour évaluation des papiers a des grosses cylindrés de la microbiologie qui n'ont certainement pas le temps de lire tout ce qu'on leur propose et qui doivent a mon avis sous-traiter leur lectures a des étudiants e le second point combien même si tu veux il lirait avec attention ce qu'on leur propose ; je ne pense pas qu'ils soient qualifié pour juger tout ce qu'on leur propose… et ce ressort clairement a travers leur commentaires . moi j'ai reçu des commentaires sur des papiers que j'ai proposés vraiment hilarants.

-Quelles raisons attribuent ils au rejet?

Quand on te rejette un papier curieusement alors que c'est dans ce cas là qu'on devrait te donner les raisons du rejet. curieusement le plus souvent on ne te donne pas les raisons. On te dit que ce papier ne correspond pas au standard de notre revue.

18. Demandez vous des explications pourquoi le rejet?

Jamais.

19. Que faites vous après le rejet?

Je le re-propose a une autre revue.

20. Sur quoi portent les révisions? Quels changements proposent ils ?

"Votre travail ne cadre pas avec les standards de notre revue». Ou bien " nous pensons que votre travail n'est pas suffisamment achevé " il faut faire d'autres manipulations etc.…

et les problèmes de langue ?

Jamais un papier n'a été rejeté pour des problèmes de langue. Les fois où j'ai eu des rejets c'était soit on ne me donnait pas les raisons et on me disait "Votre travail ne cadre pas avec les standards de notre revue "…soit parce qu'il jugeait que les résultats proposés n'étaient pas suffisamment étayés et qu'il fallait d'autres expériences pour les confirmer. Soit tu trouves des types qui te proposent carrément de faire un certain nombre d'expériences pour compléter. il te dit que ce que vous avez fait est très intéressant mais il aurait été utile de compléter par telle ou telle expérience ce que dans la pratique tu ne peux jamais faire .

Que pensez vous des critiques qui vous sont faites?

Souvent je les trouve infondées parce qu'ils n'ont pas compris le sens du papier. Souvent dans mes réponses je fais une explication de texte. plutôt que de réviser l'article ; je prends le parti de lui expliquer ce que j'ai fait et le papier a été accepté.

Après la révision pensez vous que votre article a changé de configuration, perdu de son poids etc.?

Jamais. De toutes les façons si on me demande de changer comme ca moi j'arrête. Pour soumettre un papier révisé tu as un délai et un papier révisé n'est pas considéré comme un papier nouvellement soumis. En fonction des critiques qu'on me fait je juges qu'il est souhaitable de faire les révisions ou pas du tout. Donc c'est au départ qu'ils jugent de le réviser ou pas.

21. Combien de fois réécrivez vous votre article ?

Une demi douzaine de fois

22. A quoi attribuez- vous le problème de la publication en Algérie?

D'abord en biologie, on ne peut pas cacher la réalité, on manque de production scientifique c'est a dire dans notre institut rares sont les travaux d'un niveau internationalement acceptable. le problème fondamental c'est celui là. Enfin pour les gens qui arrivent quand même a faire des travaux qui peuvent prétendre a publication……je disais la raison principale est le niveau du travail qui est réalisé au niveau de l'institut de biologie qui est très loin de répondre au standard international çà c'est le premier point .le second point c'est une question de culture , les gens ne sont pas habitués a publier leur travail et a le communiquer et paradoxalement on voit un petit mouvement s'esquisser vers la communication des travaux réalisés a l'institut et le moteur de ce mouvement paradoxalement ce n'est pas leur travail mais c'est la promotion c'est la carrière parce que pour passer maître de conférence ou prof…… il faut avoir publier… communiquer… . Les gens maintenant essayent de publier et de communiquer non pas parce qu'ils ont des choses à dire mais parce qu'il faut les dire.

Qu'en est il de la relève au niveau de l'institut?

Çà c'est un cataclysme .et vraiment je ne pense pas que cela soit spécifique a notre institut…Mais à l'université algérienne de manière générale. actuellement il y a une partie du corps enseignant algérien qui constitue un précieux capital en raison de leur compétence réelle, prouvée, et non auto proclamée comme c'est le cas pour la plus part. Et ce potentiel là malheureusement n'a pas de relève.

23. Comment pensez vous que la situation puisse être améliorée ?

Nous sommes en mesure de former notre propre relève mais on ne peut pas former une relève avec rien. Si tu veux le problème de la recherche en science biologique et dans beaucoup de science c'est des coûts. C’est des coûts faramineux pour l'état combien même il voudrait il n'a pas les

moyens de le faire ; c'est pour cela que moi personnellement j'estime que la seule réponse a ce problème extrêmement grave c'est la formation a l'étranger. Il faut en permanence que des gens soient formés à l'étranger. Dans les plus grands labo pour qu'on ne perde pas la main et pour qu'il n'y est pas de rupture dans la chaîne. Parce que en sciences biologiques il y a beaucoup de gens en Algérie si les conditions étaient réunies, ils, vraiment, feraient partie sans aucun problème du peloton de tête dans leur domaines. Mais le problème c'est que ces gens là ont des moyens dérisoires. Je dis bien DERISOIRES c'est pour cela que leur production est à la mesure de leur moyens.…Tu ne peux pas demander à un paraplégique de sauter à cinq ou six mètres. Nous sommes paraplégiques **.**la recherche n'est pas un chercheur, c'est une équipe, c'est un labo c'est tout un environnement.

TRANSCRIPTION 08

Date Interviewee B.B Pseudo **F** Setting :lab

1. Quels sont les éléments qui ont motivés la publication de vos résultats ?

la motivation ou plutôt la condition principale c'est de valoriser mon travail de thèse . Les travaux de thèse doivent être originaux, la seule manière de les valoriser c'est de publier dans des revues scientifiques de renom bien établi, dans des revues internationales càd. Se faire lire par d'autres spécialistes de la discipline. C'est la principale raison qui pousse dans un premier temps le thésard à publier.

2. Aviez vous été encouragé par quelqu'un pour publier vos résultats ?

Evidemment parce que le directeur de thèse lui aussi vit dans un système où il sait que pour finaliser et soutenir une thèse il faut effectivement passer par la publication. Donc c'est une obligation et de l'encadreur et de l'encadré.

3. Sur quelle base sélectionnez vous votre journal de publication?

- Il y a une base prioritaire c'est la discipline.…ma spécialité n'est pas la microbiologie en fin de compte c'est la discipline dominante. mes travaux de thèse ont touché a différents domaines scientifiques notamment la biochimie , d'autres sciences un peu moins connues ou qui ne sont pas très répandues mais la discipline dominante c'est la microbiologie .donc dans un premier temps on s'adresse a des revue spécialisées qui restent comme même ouvertes a d'autres disciplines et qui sont en interface avec la discipline dominante .si j'ai fait un travail sur la glotoximie , la glotoximie ne peut pas être publiée dans une

revue de biochimie mais elle peut être publiée dans une revue de microbiologie malgré que c'est une science qui a son propre champs .d'investigation etc. ses propres méthodes de recherche etc. le seul fait de faire appel a un micro organisme on a mis çà en microbiologie c'est comme le généticien il travaille sur un micro organisme et publie dans des revues de génétique parce que l'ensemble de ses travaux le poussent vers la discipline qui est la génétique. Par contre nous même si on travaille sur un micro-organisme dans la glotoximie qui est une science nouvelle et limitée dans son champs d'action donc qui n'est pas investit par beaucoup de chercheurs on publie en microbiologie

4. Prenez vous en considération la classification du journal dans lequel vous publiez?

Oui c'est un paramètre très important le statut de la revue. Evidemment il faut être honnête. Chacun sait ce qu'il a produit comme résultat scientifique. Il sait que dans telle revue, par exemple, il peut être accepté ou refusé. Donc en fonction de la valeur des résultats obtenus. Évidemment il y a une double motivation .nous on travaille, on a des résultats Et bien sur nous on aimerait les faire publier dans la meilleure revue .si on estime que nos travaux peuvent passer dans cette revue et bien on s'adresse a cette revue d’abord. Dans le cas contraire on prend nos précautions. Il vaut mieux publier et sortir rapidement ses résultats parce qu'il y a une concurrence entre chercheurs et alors on descends d'un cran .c'est a dire que l'on s'adresse a une revue qui est toujours de renommé internationale bien établie avec des référés, un comité de lecture, qui n'est pas à la portée de n'importe qui mais qui plus au moins… . C’est à dire que l'on procède par élimination. mais il y a aussi une autre manière de publier parce qu'il y a certaines revues qui sont spécialisées. il y des revues qui acceptent de publier les premiers résultats .dont l'émulation qu'il y a entre chercheurs qui obtiennent les premiers résultats au lieu d'attendre encore pour étoffer son travail et publier dans une revue bien établie il veut marquer des points il publie dans des revues qui font des notes qui sortent des premiers résultats

alors on envoie a ces revues on sacrifie une partie des résultats obtenus en étant les premiers dans le terrain pour être cité ou sollicité etc. des fois on se surestime et on est refusé soit on se sous estime et on a perdu. Tous les algériens faisions les mêmes pratiques on s'est inséré dans des créneaux de recherche d'un pays donné qui lui même à ces propres créneaux en fonction des autres pays c'est a dire qu'il y a une domination de la recherche on ne vous ouvre pas la porte pour rentrer dans des Lab. de pointe et où la recherche vole très haut .reste maintenant les Lab. où personnellement j'ai été qui est placé au dessus de la moyenne du point de vue recherche; de l'intérêt qu'il porte au niveau de son pays

5. Comment avez-vous procédé pour rédiger votre article en Anglais?

Je l'ai d'abord écrit en Français c'est a dire synthétisé, arrangé en fonction des conditions posées par la revue parce que chaque revue pose ses conditions. Le texte a d'abord été fait en français d'abord je ne peux réfléchir et écrire qu'en français ensuite premier jet première traduction en anglais que j'ai fait moi même ensuite ce premier jet a été corrigé avec mon directeur de recherche qui a le même niveau que moi en anglais ou peut être un peu mieux que moi. première correction mais on ne s'arrête pas là parce que eux ils ont instauré un système où il y a des … personnes spécialisées en langue des traducteurs (une américaine qui aide les chercheurs dans leur traduction d'articles ou bien nous consultons le privé c'est a dire des gens installés en ville et qui offrent leur services; on a fait ensemble la version commune travaillée en anglais travaillée et bien présentée par des spécialistes on veut pas risquer d'envoyer quelque chose qui sur le plan de la langue …la première traduction est totale c'est moi qui l'ai faite

6. quels sont les éléments qui vous ont aidé pour faire ce travail ?

Premièrement le travail était bien mâché. à force de lire des articles dans le même domaine voilà ce qui c'est passé quand je dis que j'ai rédigé en français. en réalité c'est en lisant des articles en anglais qui sont été a 99% en Anglais et traduit ou synthétiser par moi même en

français pour faire mon expérimentation donc quand je rédige en français ce n'est qu'un retour vers des articles que j'ai lu en anglais. Donc s'il y a des termes que je ne comprend pas je cherche dans le dictionnaire mais sur la conception du texte, la manière de présenter une expérience donnée je l'ai reproduit des autres articles même inconsciemment et c'est comme ça que le premier jet de l'article du français en anglais a été fait comme ca le patron par la suite a changé certains termes certaines tournures

7. Aviez vous fait appel à un angliciste pour la révision linguistique ?

Sur place Non on s'est directement adressé aux experts de traduction. et cela pour des raisons objectives. S'ils étaient prés de nous on leur aurait certainement fait appel. Nous sommes un centre de recherche isolé, nous partageons certaines sections etc. nous étions une institution qui n'avait pas de contact avec d'autres facultés .en fait pour les scientifiques on ne s'intéresse a la traduction que lorsque on arrive a cette étape;

8. Quels types de difficultés aviez vous rencontrées en rédigeant en anglais?

La rédaction en anglais c'est beaucoup plus une partie de plaisir qu'autre chose parce que tout est finalisé on a tout fait…il ne reste que transformer ce texte en anglais …lorsque on arrive a la traduction on est plus a l'aise, on le fait à l'aise sachant que l'on va se faire corriger a la fin. il nous arrive aussi de faire appel a nos collègues anglophones ici dans le département et cela se passe toujours dans la même ambiance, on fait le premier jet et eux les finitions.

9. Présentez vous votre travail dans une conférence avant de le soumettre?

Oui. Dans notre Lab. une rencontre de tout le personnel du Lab. se faisait une fois par semaine ; une fois par semaine chaque scientifique (toute personne ayant un diplôme académique, universitaire)… présentait ses résultats et on rédigeait cela sous forme de

communication. Ensuite au niveau du centre où il y a plus de 300chercheurs on organisait des séminaires inter centres et on communiquait les résultats mensuels .en plus il y avait les rencontres organisées par l'INRA une fois par an et où on était tenu de participer. Constamment on était entrain de communiquer, d'exposer nos résultats, de corriger etc. donc tout le travail est mâché en cours de route. Jusque là c'est en français mais lorsque ça arrive à la société française de microbiologie là c'est en anglais.

10. Que pensez vous du problème de la publication en Algérie et comment peut on y remédier ?

La recherche c'est d'abord l'environnement scientifique. Auparavant on avait une image du monde on croyait que l'on pouvait faire de la recherche facilement; alors que la recherche c'est un produit qui nécessite des moyens financiers ; des moyens pour acheter le matériel, pour acheter des produits etc. A coté de l'achat ; il y a aussi d'autres problèmes par exemple lorsque le résultat est produit se posent d'autres problèmes tels que: quel est l'intérêt de ce résultat? par qui va -il être utilisé et d'abord à qui le communiquer etc. c'est tout cet environnement scientifique qui fait défaut. Aussi on avait pas de revues où publier en un mot ; en amont nous n'avons pas les moyens financiers nécessaires, même si on avait les moyens on a pas les gens qui produisent les appareils *in situ* etc. et qui peuvent les entretenir.… Tout cela indépendamment du thème de recherche .des résultats sont obtenus qui est garant de leur valeur ; dans quelle revue peut on les exposer s'ils sont les premiers résultats a être exposer, qui vont aboutir sur quelque chose d'applicable etc. s'ils débouchent qui c'est qui va les utilisés ?tout cela n'existait pas en Algérie…Après qu'il y est eu une politique de formation des formateurs a l'université tout l'environnement n'a pas ce niveau .ce n'est que maintenant que l'on commence a se rendre compte que tout va ensemble; il faut tout mettre ensemble… si il y a un tissu industriel privé ou publique qui posait un problème normal ; je me réorienterai je solutionnerai le problème ;ici le problème de la demande fait défaut .nous avons une formation académique toute simple nous

faisons tout simplement de la recherche fondamentale .certes, celle ci est bien mais quels sont les moyens de cette politique?Tout l'environnement scientifique nécessaire à la production scientifique quelle soit appliquée ou fondamentale n'existe pas ici en Algérie .nous procédons par à-coups …ajouté a cela il y a l'incompétence scientifique. Pour résumer il y a un manque de moyens financiers, humains, la formation, l'utilisateur, les activités scientifiques en elles même sont sujettes a discussion. Pour résoudre cela. Ca ne sera pas pour demain. Il faut tout revoir

TRANSCRIPTION 09

Date Interviewee SM Pseudo**G** Setting :OFFICE

1. **Quelle est l'importance de la publication chez un chercheur scientifique?**

Globalement quand on est dans un système universitaire, on est sur un programme de recherche. l'axe de travail sur lequel la publication de travail est rédigé est un axe relativement récent parce qu'il concerne la politique de l'environnement; un problème d'actualité; donc tout universitaire qui fait un travail scientifique doit impérativement publier.

2. Comment l'idée de la publication est elle née chez vous ?

…en 1988 j'ai fait ma thèse de troisième cycle et donc j'avais beaucoup de résultats et j'avais entamé le compte a rebours pour un travail de thèse alors le prof a rédigé a ma place les deux premiers articles ; deux mois avant mon départ il m'avait proposé de les soumettre a publication, je n'avais ni le temps ni l'expérience de les rédiger moi même ; le prof les avait rédigés en français pour moi.

3. Est-ce que les résultats à publier sont préalablement discutés?

Question answered in 2

4. Sur quelle base choisissez vous le journal de votre publication ?

D'abord c'est une revue qui est moyennement cotée même si le travail que l'on fait est très intéressant on a un certain recul; on ne peut pas le grossir et prétendre a certaines revues comme *science* et aussi parce que c'est une revue qui traite des problèmes liés a l'environnement et aussi parce que le prof fait partie du comité de lecture …

5. Avez-vous essayé de la soumettre à un journal top ?

Question answered in previous answer

6. Comment avez vous procédé pour rédiger l'article?

L'article entier en langue française c'est moi qui l'ai rédigé. Ensuite j'ai essayé de traduire. Cette traduction je l'ai faite moi même .Comment je l'ai faite? Je me suis inspiré des articles scientifiques qui parle du même thème communiant certains mots, certaines phrases, quelques tournures …qui correspondent a notre travail …je crois qu'on ne rate rien du tout d'autant que le vocabulaire en anglais est modeste. C'est comme ça par exemple dans tout l'article. j'ai laissé le soin a d'autres auteurs qui m'accompagnent pour c'autres sections . Matériel et méthodes c'est moi même qui l'ai rédigé ça mais la discussion, je l'ai laissée aux autres, j'ai dit aux autres je vous laisse le soin de le faire. Cela fait quatorze ans que nous avons des relations très cordiales et bonnes .donc le prof il avait donné l'introduction et la discussion a B J H qui est prof dans le service. Elle est jeune. Elle a notre âge et qui avait fait un séjour en Angleterre pendant une année et demi et qui a suivi des cours sur la manière de rédiger des articles en anglais c'est elle qui a participé a la traduction des autres sections; c'est pour cela que son nom apparaît ici.

7. Avez vous jamais consulté des manuels sur le comment rédiger un article ?

Pas du tout. Moi je suis au courant parce que mes collègues ont fait cette formation avec quelqu'un qui est spécialisé dans ce domaine. ils leur ont toutes les informations concernant cela. Donc ma proposition serait d'organiser des séances sur ces thèmes

8. Quels types de difficultés avez vous rencontrés en en anglais ?

Franchement je n'avais aucune difficulté et j'ai trouve en particulier cet article facile a rédiger est ce que c'est lié au fait qu'il y ait eu auparavant des articles qui m'ont inspiré sur la manière de faire; je n'ai pas trouve beaucoup de difficultés et surtout il y avait un article qui date de l'année

80et dont le thème était similaire au notre et même au niveau des méthodes qu'il a utilise j'ai trouvé là une source d'information et une source d'inspiration pour rédiger franchement je n'ai eu aucune difficulté cet article.…je savais quoi dire; je pouvais le dire avec mon anglais pauvre et modeste mais je ne l'aurais pas dit aussi bien que cela. En plus matériel et méthodes ce n'est pas difficile parce que c'est un truc commun, traditionnel. Quand on arrive au niveau de la discussion où il y a beaucoup de tournures de phrase (même en français il faut trouver les mots pour exprimer une idée juste .)

9. Quels types de difficultés rencontriez- vous lorsque vous rédigez en français?

Not concerned

10. Est ce que l'article a été relu pour une correction linguistique?

Oui; il a été remis à un coauteur qui est angliciste mais qui n'est pas scientifique mais qui enseigne l'anglais dans un lycée ; c'est l'épouse de mon prof.

11.Etes vous satisfait de cette révision linguistique ?

Oui

12. Il est souvent dit que l'entrée dans le monde de la publication scientifique est difficile. Prenez vous certaines précautions pour faciliter cette entrée ? Par exemple,

a) Aviez vous essayé d'inclure dans vos références des "éventuels" référées? **Ou bien**

b) Aviez vous présenté votre article lors d'une conférence avant de le soumettre a publication?

Non je ne travaille pas comme ça. C'est à dire lorsque je consulte la bibliogr**.** Si tel travail correspond a mon travail je le cite. C'est vrai que j'ai cité par exemple mon prof; mais c'est inévitable. De ce coté là je n'ai pas spécialement cherché des chercheurs susceptibles de faire partie de

mes référés. Quant a la présentation lors d'une conférence oui. D'abord le programme de recherche est financé par l'INRA. La première des choses c'est de rendre compte si on travaille ou on ne travaille pas. C'est donc de vérifier si on a obtenu des résultats. si ces résultats sont satisfaisants ou pas. Donc en cours de route le comité de INRA nous convoque et nous on expose et eux proposent et critiquent .donc il y a une évaluation en cours de route par ceux qui financent le programme .et bien sur tout cela prépare a la publication.

13. Quelle adresse de correspondance avez vous utilisé? Est ce que cela a un sens ?

Ca n'a aucun sens. Surtout parce que je fais partie de l'équipe là bas. C'est beaucoup plus pour des raisons pratiques …

14. Qui sont les auteurs ? Qu'a fait le premier pour être cité en premier?

P.H est spécialiste en xxxx on a élaboré le protocole expérimental ensemble donc nous avons travaillés en équipe elle est moi. La deuxième était une technicienne confirmée qui a mis au point les méthodes analytiques ; elle a mis au point les méthodes avec lesquelles on dose. B est la prof qui a participé a la traduction la quatrième par solidarité parce qu'elle fait partie du Lab. Et le prof qui les recrute. C'est lui la cheville ouvrière de ce programme.

15. Est ce que l'ordre des nom a un sens particulier?

Absolument .les gens qui sont a l'origine de l'article. Ceux qui ont bossé le plus, sont cités en premier. Comme le deuxième auteur et moi avions développés le protocole expérimental en commun on avait obtenu beaucoup de résultats donc on pouvait écrire deux articles et c'est comme ça qu'on avait convenu que pour cet article je serai cité en premier et pour le second ça sera elle ; c'est un travail complémentaire. C'est pratiquement la même chose c'est un protocole expérimental en commun sauf que une partie des résultats est exploitée par ma collègue moi j'ai exploité celle ci .

16. Est ce que l’article a été lu par vos collègues avant de le soumettre?

Question answered in previous answers

17. Pensez vous qu'il y a une certaine part de subjectivité de la part des référé quant a l'évaluation de vos articles?

Préjugés je ne pense pas. Parce que quand je lis les révisions; j'ai l'impression que ça rajoute un plus. Je suis étonné qu'il puisse y avoir de telles pratiques …dans cette revues il y a des chercheurs de tous les pays du monde, du Koweït de l'Egypte etc

18. Quels sont les critères d’évaluation d’un article ?

Il y a plusieurs critères d’évaluation scientifique. Tout d’abord il y a la consistance des résultats, leur originalité, les méthodes utilisées. …Aussi il y a la réputation du laboratoire qui engage son nom.

19. pensez vous qu’un article puisse être rejeter sur une base purement linguistique ?

Oui je pense que cela est important mais pas plus déterminant que le contenu Scientifique. On peut palier a cet aspect en soumettant l’article a des services spécialisés.

20. Etes vous découragé après un rejet ? Abandonnez vous l’idée de publier ?

Jamais. On continue a chercher une revue qui nous sied et on le re-soumet

21. Sur quoi portent les corrections. Quels changements proposent ils ?

Il y a des corrections de forme et de fond; la forme elle englobe l'aspect linguistique le fond c'est l'aspect scientifique ce sont des gens extrêmement compétents dans le domaine et qui demandent des informations que nous avons peut être omis de mentionner

22. Combien de fois aviez vous réécris l'article?

3 versions, (française, mi anglaise mi française, anglaise). Une fois l'article soumis, la révision et les corrections.

23. A quoi attribuez- vous le problème de la publication en Algérie?

Le contexte en Algérie, ce n'est pas un problème linguistique, je ne pense pas ; on peut publier en langue française; il y a des revues scientifiques en langue française; si les gens souhaitent publier dans des revues internationales en anglais à ce moment là les gens doivent s'exprimer. Je pense que pour publier il faut d'abord avoir des résultats et bien sur pour avoir des résultats il faut avoir un environnement ; quand on a des résultats réellement scientifiques on peut les publier.

24. Comment pensez vous que la situation puisse être améliorée ?

D'abord il n'y a pas de travaux chez nous donc il n'y a pas d'articles publiables. Supposons qu'il y ait des moyens pour faire de la recherche et qu'on ait des résultats publiables ; il suffit de rédiger son article de la même manière que j'ai fait (s'inspirer des autre articles) mais il faut avoir la collaboration d'un angliciste qui traite des articles scientifiques… a la limite je me demande si on ne peut pas organiser avec tous les scientifiques des séances pour les informer, pour les orienter comment rédiger un article en anglais. Je pense aux règles de rédaction que la plupart ne connaissent pas très bien

APPENDIX D :

Sample of Journal Editors' Questionnaire

Dear editor,

This survey is being conducted as part of a doctoral research work which aims at understanding the role of English in International communication. It seeks to investigate the writing processes of Algerian scientists and the problems they encounter in getting published in English.

The results of this survey will help us gain better understanding of the situation and allow us to design and implement more effective courses for science students.

We would highly appreciate your cooperation, if you could take time by completing the attached questionnaire

The information provided will be treated as strictly confidential and will be used for the purpose of this study only.

Yours sincerely

Doudja SLOUGUI
Doctoral research student
University of Constantine –ALGERIA-
Department of English

We would be very grateful if you could please return the completed questionnaire to this email address:
dslougui@hotmail.com

Journal Editors' Questionnaire

1) The intrinsic quality of scientific work is the principal criterion for publication. However, other values might influence your decision when judging a manuscript. Please rank the following on a scale from the "most important (with the score of 5) to the "least important" (with the score of 1**).**

Criteria	Degree of importance
A- Quality of reporting	
B- Relevance to the journal focus	
C -Originality of the work	
D -Professional attributes of the main author or one of the co- authors	
E -Place of origin of manuscript	

2) Do you think the quality of reporting could be a major cause for rejection?

☐Yes
☐No

If yes why?

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3) Do you think rejected papers preclude authors from publication?

☐Yes
☐Sometimes
☐Rarely
☐No

4) What is the author's usual attitude towards rejection?

☐Asks to reconsider judgement
☐Re-submits an improved draft
☐Submits to another journal
☐Abandons rejected draft

5) What types of language errors are often found in poorly written manuscripts?

☐ Incorrect use of tenses
☐ Articles
☐ Spelling
☐ Sentence construction
☐ Use of articles
☐ Prepositions
☐ Noun related problems
☐ Misuse of words

6) Do you objectively feel that there might ever be an editorial bias against submissions originating from unknown places?

☐ Yes
☐ Possibly
☐ Generally no
☐ No

7) Do you think the linguistic changes brought to revised manuscripts are often meant to moderate the level of scientific claims advanced by authors?

☐ Totally agree
☐ Partially agree
☐ Neither agree nor disagree
☐ Partially disagree
☐ Totally disagree

8) What suggestions could be made to help increase the non English speakers' chance of seeing their work into print?

_____
_____
_____
_____
_____

Thank you for completing and returning the questionnaire

APPENDIX: E

LIST OF JOURNAL EDITORS

	JOURNAL TITLE	ISSN	Subject:	Publisher:	Country:
01	African Journal of Biotechnology	16845315	Biology	Academic Journals	USA
02	Algorithms for Molecular Biology	17487188	BiologyGenetics	BioMed Central	United Kingdom
03	BC Journal of Ecosystems and Management	14884666	Biology --- Forestry	Forest Research Extension Society	Canada
04	Biodiversity Science	10050094	Biology	Science Press	China
05	Biogeosciences	17264170	Earth Sciences --- Geology --- Biology	Copernicus Publications	Germany
06	Biointerphases	15594106	Medicine (General) --- Biology	AVS: Science and Technology of Materials, Interfaces and Processing	United States
07	Biological Procedures Online	14809222	Biology	University of Waterloo, Faculty of Science	Canada
08	Biology Direct	17456150	Biology	BioMed Central	United Kingdom
09	BMC Developmental Biology	1471213X	Biology	BioMed Central	United Kingdom
10	BMC Ecology	14726785	Biology --- Ecology	BioMed Central	United Kingdom
11	CBE—Life Sciences Education	19317913	Biology --- Education	American Society for Cell Biology	United States
12	Cell & Chromosome	14759268	: Biology	BioMed Central	United Kingdom
13	Cell Communication and Signaling	1478811X	Biology --- Medicine (General)	BioMed Central	United Kingdom
14	DNA Research ..	13402838	Biology --- Biochemistry --- Genetics	Oxford University Press	United Kingdom
15	EURASIP Journal on Bioinformatics and Systems Biology .	16874145	Biology --- Electrical and Nuclear Engineering	Hindawi Publishing Corporation	United States
16	Genomics, Society and Policy	17465354	Biology --- Sociology --- Genetics --- Philosophy	Sage	United Kingdom
17	International Journal of Biomedical Science	15509702	Biology --- Medicine (General)	Master Publishing Group	United States
18	Internet Electronic Journal of Molecular Design	15386414	Chemistry (General) --- Biology --- Biochemistry	: BioChem Press	United States
19	The Internet	15402630	Biology ---	Internet Scientific	United

	Journal of Genomics and Proteomics		Genetics --- Biotechnology	Publications, LLC	States
20	Journal of Autoimmune Diseases (JAD)	17402557	Biology --- Law --- Therapeutics --- Genetics	BioMed Central	United Kingdom
21	Journal of Biological Engineering	: 17541611	General and Civil Engineering --- Biology	BioMed Central	United Kingdom
22	Journal of Biology	14785854	Biology	BioMed Central	United Kingdom
23	Journal of Biomedical Discovery and Collaboration	17475333	Science (General) --- Biology --- Medicine (General)	BioMed Central	United Kingdom
24	Journal of Biosciences	02505991	Biology	Indian Academy of Sciences	India
25	Journal of Circadian Rhythms	17403391	Physiology --- Medicine (General) --- Biology	BioMed Central	United Kingdom
26	Journal of Molecular and Genetic Medicine	17470862	Microbiology --- Biology --- Medicine (General)	Library Publishing Media, Oxford	United Kingdom
27	Molecular Systems Biology	17444292	Biology	European Molecular Biology Organization, Nature Publishing Group	United Kingdom
28	Molecular Vision	10900535	Biology	Molecular Vision	United States
29	Nucleic Acids Research	03051048	Biology --- Biochemistry --- Chemistry (General)	Oxford University Press	United Kingdom
30	Acta Protozoologica	00651583	Microbiology --- Ecology	Institute of Environmental Sciences Jagiellonian University	Poland
31	Annals of Clinical Microbiology and Antimicrobials	14760711	Microbiology	BioMed Central	United Kingdom
32	BMC Microbiology	14712180	Microbiology	BioMed Central	United Kingdom
33	Filaria Journal	:14752883	: Microbiology	BioMed Central	United Kingdom
34	Immunome Research	17457580	Microbiology --- Allergy and Immunology	BioMed Central	United Kingdom
35	International Microbiology	11396709	Microbiology	Springer	Spain
36	The Internet Journal of Microbiology	19378289	Microbiology	Internet Scientific Publications, LLC	United States
37	Microbial Cell Factories	14752859	Microbiology	BioMed Central	United Kingdom

APPENDIX: F

TOXICOKINETICS OF LEAD IN THE LACTATING EWE:

Variations induced by cadmium and zinc

(Drafts and published paper)

APPENDIX: G

A novel C to A transversion within the distal CCAAT motif of the Gγ globin gene in the Algerian Gγβ+ HPFH

(Draft and final paper)