Bialystok's 'Processing Continuum Model':
a 'Cognitive' Approach to Patterned Variation in SLA.

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ABSTRACT

This paper *reports* a *study* which, applying Bialystok's *framework* for analysing rask variarion, *investigates* rhe *proficiency* of 52 English learners of Spanish ar *two* differenr levels -advanced and intermediate-wirh *regard* ro four Spanish conjuncrions across rhe following rask condirionst judging grammarical senrences *(GR/GR)*, judging ungrammarical senrences *(UNG/UNG)*, *correcting* ungrammarical urrerances *(UNG>GRJ*, and *translating orally* (OTJ. All rhe *tasks* presenred rhe *same* linguisric *context* and were carried *out* under similar condirions. *Results* of rhe srudy *provide evidence in support* of rhe *hypothesis* rhar rhe urrerances ofsecond language learners show a *systematic variability related to* rask. The *study also* shows rhar such *variability may be related to* rhe differenr *demands* each rask imposes on *the* learners' *ability* ro analyse linguisric knowledge *and/or* on *their* ability *to* conrrol *the* access ro rhar knowledge. Moreover, we *attempt* ro *argue* rhar Bialysrok*'s* use of rhe norions of "analysis" and "conrrol" *blurs* rhe *traditional* disrincrion *"competence/performance"*, much in rhe line of Cognirive *Linguistics* analyses.

KEY WORDS: Bialystok, processing continuum model, language **learning**

RESUMEN

Este artículo presenta un *experimento* que, aplicando el modelo *propuesto* por Bialysrok *(1982, 1991)*, invesriga la variabilidad en la actuación de 52 esrudianres de español al llevar a cabo cuatro rareas o ejercicios diferenres: evaluación de oraciones gramaricales *(GR/GR)*, evaluación de oraciones no gramaricales *(UNG/UNGR)*, corrección de oraciones no *gramaticales (UNG>GR)*, y rraducción oral (OTJ. Los esrudianres *pertenecían* a dos niveles disrinros de *español* -avanzado e inrermedio-. Todas las rareas presenraban el mismo *contexto* lingüísrico y se llevaron a cabo bajo las mismas condiciones. *Los resultados* del experimenro corroboraron la hipóresis que sostiene que la actuación de los aprendices de una segunda lengua es siremáricamenre *variable* y que dicha *sistematicidad* esrá condicionada por el *tipo de tarea* a realizar. El esrudio *también* muestra que esra variabilidad puede *estar* relacionada con las diferenres demandas que cada una de las rareas impone en la habilidad de los esrudianres para analizar el conocimienro lingüísrico y/o en su habilidad

para controlar el acceso a este conocimienro. Además, intentaremos argumentar que el uso que hace Bialysrok de las nociones de "análisis" y "conrrol" difumina la distinción tradicional entre "comperencia" y "actuación" conforme a los postulados de la Lingüística Cogniriva.

PALABRAS CLAVE: Bialysrok, "processing conrinuum rnodel", aprendizaje de lenguas

I. INTRODUCTION

One of the greatest difficulties in establishing an overall theory of Second Language Learning which is relevant to the way people learn second languages, has been our inability to define unambiguously the relationship between knowing and using linguistic forms.

It has been claimed (Bialystok 1979, 1982, 1991) that knowing a form does not ensure that the form will be used in every appropriate situation when the circumstances change. Variability has been reported in learner output both between what has been taught and what is used and between what the learners use in different situations (e.g. Tarone, Frauenfelder and Selinker 1976; Bialystok 1982). The question is, if learner output is so variable, how can an adult, native speaker of some language, acquire both the knowledge of a new system and the ability to use that system appropriately both conversationally and linguistically?. The answer to this question lies in what is now one of the most basic assumptions in second-language acquisition research: that the language produced by language learners is variable in a predictable manner. Language-learner language is assumed to be systematic, that is, to be ruled by some underlying principles that enable learners to acquire a second language. But what does it exactly mean to affirm that learner output is systematic when there is evidence that the learner's performance varies from one situation to another?

This paper attempts to approach such a question by presenting our own empirical evidence of variation in learner language. It surnmarises the main results and conclusions of an experiment carried out as part of my M.A Dissertation submitted at Salford University in 1993. We shall first review some of the main theories proposed to explain the nature and causes of task-related variability in the language produced by second-language learners. It will be argued that task-related variation can oniy be fully explained by considering imer processing (i.e., cognitive) factors as causes of such variation. Moreover, we will try to show the compatibility of 'cognitive models' of SLA with Cognitive Linguistics postulates, as stated in the work of Langacker (e.g., Langacker, 1987, 1991). Secondly, an imer processing theory, namely, Bialystok's (1982, 1991) psychological processing model, will thus be proposed to describe the systematic causes of task-related variation. And finally, we will introduce the results of an experirnent which, applying Bialystok's framework, attempts to investigate empirically both the 'cognitive' constraints that operate to produce variability in learner speech and the principles that contnbute to progressive mastery of the language.

II. EXPLANATIONS FOR IL VARIABILITY.

It is now axiomatic that the language produced by second-language learners is systematic (e.g., Corder 1967; Nemser 1971; Selinker 1972). In order to review the variety of methods which have been used to define the nature of such systematicity (and by default, of variation), we will mainly follow Tarone's (1988) study of research on IL variation.

Tarone classifies the SLA theories which **have been** proposed to account for systematicity in IL variation into two general types:

1) Theories which look to psychological processes for causes of variability in IL, or what she calls "imer processing theories". Exarnples are Krashen's Monitor Model (Krashen 1981,1982), the "Chomskyan" models of Adjemian (1976, 1982) and Liceras (1981,1987); the extensions of the "Labovian" models of Dickerson (1975) and Tarone (1983,1985); and Sharwood-Smith and Bialystok's psychological models (Bialystok & Sharwood-Smith 1985, Bialystok 1982).

2) Theories which **provide** social and form-function explanations of IL variation, such as Beebe and Gile's model (1984).

Unfortunately, lack of space **does** not allow a detailed discussion of **all** the theories. Instead, oniy those theories which we consider to be most relevant to the **purposes** of our study will be reviewed. Since the focus of this work **is** on 'cognitive processes', a further distinction of the so-called "imer processing theories" will be made into two groups according to the type of variability description they **provide**.

II.1. "INNER PROCESSING THEORIES: THE CHOMSKYAN AND LABOVIAN MODELS".

Some have addressed the problem from a 'linguistic' perspective, placing the emphasis on the conditions eliciting the most systematic **and**/ or the most grammatical forms of language. This **is** the case of "Chomskyan" models of language acquisition, such as those proposed by Adjemian (1976, 1982) and Liceras (1981, 1987). Importing Chomsky's views on 1LA to 2LA, these authors argue that learners follow acquisitional sequences determined by an **internal Language** Acquisition Device. Universal **Grammar** Theory holds that learners approach language acquisition endowed with **innate**, specifically linguistic knowledge that is biologically determined and specialised for language **learning**. **In** order to reconcile such a claim for an **innate** language acquisition ability with the undeniable **evidence** of variation in the learner's IL, they resort to the distinction between "competence" and "performance". They claim that IL systematicity lies in the homogeneous system of **rules** or competence, which underlies the learner's efforts at performance. On the contrary, **all** variability **is seen** as a performance aspect and, therefore, non-systematic.

The other "imer processing theory" which investigates variation from a predominantly linguistic point of view **is** that of **Tarone's** (1983,1985) extension of the "Labovian" models. Such a theory, **in** contrast to "Chomskyan" models, **proposes** that the learner's competence **is** heterogeneous, made up of a system of variable and categorical **rules** based on particular contexts of use. These contexts are charted along a continuum of styles which range from formal to vernacular. It **is** the list of these **rules**, both variable and categorical, which **provides** a **definition** of language variability by describing the language under those conditions in the continuum.

Although Tarone still suggests, following **Labov**, that the style learners **call** upon depends on the degree of attention paid to language form, her approach **is here** considered 'linguistic' **because** the determinant for the set of **rules is** primarily given by the point along the style continuum in which the elicitation situation is **placed**. The methodology proposed to investigate variation consists in giving the **subjects** a range of **tasks** ordered from those

which require attention to the form of the discourse to those which require attention to the content of the discourse. The assurnption is that in the style produced when the learner is paying the least attention to language form, gramatical forms will be produced with least accuracy whereas in the style when the learner is paying the rnost attention to form, gramatical forms will be produced with most accuracy. Gramatical accuracy is usually measured by the syntactic presence or absence of the form in obligatory contexts.

Nevertheless, the shortcornings of an explanation based solely on "attention" were revealed in Tarone (1985). She found different patterns of style-shifting for four English forms -third person singular present tense verb -s, the article, the noun plural -s, and third person singular direct object pronouns- across three different tasks -test. interview and narrative-. Her results showed that oniy one form -the third person singular- seemed to improve from the interview to the test. The other two either decreased - e.g. articles - or did not shift at all - e.g. plural -s-.

Since it would be unlikely that learners paid different attention to each language form without any particular reason, another type of explanation seemed necessary. The solution was provided by Tarone herself, who, resorting to "function-form" explanations traced the causes of such variation to the different comunicative demands required by the type of discourse in each task. For instance, in order to explain the decrease in accuracy of the articles, she argued that accuracy was better in the interview because the referential function performed primarily by articles and pronouns is very important in connected discourse (as reflected in the interview and narration tasks). However, accuracy decreased in the grammatical test because the referential function is less important in a task where cohesiveness in discourse does not matter so much.

The problem with "discourse" explanations like this is that, although very useful to explain linguistic variation within tasks, there seems to be no easy way to account for the evidence supporting the constraint of "attention to speech". How can a function-form explanation account for the general increase in the accuracy of the four forms as a whole, from the interview to the test? Moreover, it cannot account either for variation across tasks which present similar amount and type of discourse but vary in the mental operations required (Lund 1986; Chaudron 1983). Perhaps, re-analyses as that of Tarone's (1985) rnay provide some insight into the process of variation, but first it seems necessary to re-define the term function, since it is still confusing and undeveloped.

11.2. "THE SOCIAL MODEL"

So far, the assumption of a continuum determined by differing degrees of attention has managed to account for variation in tasks ranging from free speech to grammaticality judgement tests. Furthermore, in cornbination with function-form explanations has also succeeded in explaining linguistic variation within tasks. Nevertheless, such an approach still provides oniy a partial explanation for task variation. As Beebe (1982) and Bell (1984) observe, anention can oniy be at best an intermediary, not an explanatory factor. On the basis of this claim, attempts to determine these end causes of variation have shifted the focus of research from "attention" into two different directions.

Some researchers, such as the already rnentioned Beebe and Bell have focused on external social constraints as causes of variation. Instead of attention, they propose to

establish what is in the task and in the situation that causes learners to pay attention to speech and. thus, to style-shift. The cause of IL variation in this approach is usually traced to social factors, such as the identity of the interlocutor, the topic of discussion and the social norms activated in the speech situation. Although these theories have the advantage that are all empirically verifiable, Tarone (1988) has also pointed out that the controls in these studies have been too lax, using, for exarnple, more than one variable at a time. Moreover, almost none of them establish a clear relationship between the social constraints they point to and particular linguistic features of the IL. The theories are promising in that they point to the irnportance of social factors in SLA. However, in their current stage. they fail to account for all the evidence which keeps social variables constant across tasks.

II.3. "INNER PROCESSING THEORIES: THE COGNITIVE MODELS"

Others, however, have taken an approach to the study of SLA which ernphasizes the importance of "cognitive processes" in influencing both the acquisition and use of IL. They have atternpted to investigate both situational factors' and the inner processes these factors cause to operate. They aim at discovering the cognitive constraints imposed on the learner by various language situations. In this approach, attention is still a factor, but only a mediating one between the tasks and the demands they irnpose on higher cognitive mechanisms. This is the sort of approach illustrated by Krashen's Monitor Model[2] and Psychological Processing Theories.

These theories, which have their roots in research on human information processing and which Tarone (1988) classifies as "psychological processing theories", differentiate "between knowledge and the processes used to implement that knowledge in communicative performance" (Tarone 1988: 33).

McLaughlin (1978) outlines the broad characteristics of an approach that reconciles systematicity and variability by emphasizing the cognitive processes involved in the intemalization of knowledge. These processes account for how rules are accurnulated and automated and how learners restructure their internal representations to match the TL: to start with, IL production requires 'controlled processes' which dernand the leamer's attention, but repeated performance leads to the availability of the form via automatic processes[3]. The result is that less and less attention is required for autornated routines and the learner can attend to other forms or sequences that are not yet automated. This finds a clear parallel in Langacker's notion of *entrenchment:*

> Linguistic structures are more realistically conceived as falling along a continuous scale of **entrenchment** in cognitive organization. Every use of a structure has a positive impact on its degree of entrenchment (…). With repeated use, a novel structure becomes progressively entrenched, to the point of becorning a unit; rnoreover, units are variably entrenched depending on the frequency of their occurrence. (Langacker, 1987:59).

McLaughlin (1978) explains task-related variation in terms of this distinction between 'controlled and automatic processes'. In this sense, when a learner can use a form in simple tasks, but not in more cornplex communicative ones, it is assumed that the learner is still producing that form by means of controlled processes. Although theoretically plausible, this

explanation posits the problem of ernpirical validation. As Tarone (1988: 34) points out, this theory seerns to identify 'controlled processes' with the leamer's performance in simple tasks which allow thern to focus their attention. and 'autornatic processes' with their performance in cornplex tasks. But the problern is the distinction between 'simple' and 'cornplex communicative' tasks: to test this theory ernpirically we need to specify what is exactly understood by a 'simple' or a 'cornplex' task.

II.4. CONCLUSIONS.

Thus far, all the theories we have reviewed have failed in one way or another to account for IL variation. The ovenvhelrning evidence on Tarone's stylistic continuurn has brought to light the shortcornings of hornogeneous approaches to cornpetence. The "Chornskyan" view of variability as part of the leamer's non-systernatic performance is no longer compatible with the existence of consistent variation pattems in the leamer's use of the language.

But the factor of attention to form proposed by "Labovian" rnodels also fails to give a full account of IL variation. Whereas it explains general variation across tasks, it still has to resort to function-form explanations in order to account for differences arnong several linguistic forms. Furthermore, we are still left with the question of determining those factors inherent to the tasks that cause a shift in the leamer's attention.

"Social psychological explanations", such as those of Beebe (1982) and Bell (1984) have tried to answer this question by looking for altemative causes which, unlike "attention", can be ernpirically observed. However, the evidence on these social factors is very little and alrnost none of the studies establishes a clear relationship between these factors and particular linguistic features.

Others, like McLaughlin, have atternpted to determine the cognitive processes which, in cornbination with certain situational factors, underlie the reported shift in attention. We believe such a cognitive account is necessary in order to fully account for the existing evidence. As we have seen, differences between tasks eliciting different types of discourse can be described in terms of the functional dernands imposed by the different types of discourse (e.g. Tarone 1985). But differences such as those between discriminating and correcting errors (e.g. Lund 1986) seern harder to explain only in linguistic terms.

III. BIALYSTOK'S PROCESSING CONTINUUM MODEL

Bialystok (1978, 1982, 1983) and Bialystok and Sharwood-Srnith (1985) atternpt to develop an information-processing theory of SLA which overcornes the limitations of Mc Laughlin's approach by specifying the dernands different tasks impose on the leamer's cognitive abilities. Following processing accounts, they propose that explanations of leamer performance should be related to two dimensions of language proficiency: the way in which knowledge is represented in the leamer's rnind, and the processing system leamers use to control this knowledge during language production.

One of the main points which connects Bialystok and Shanvood-Srnith's approach with Cognitive Linguistics postulates is their treatment of 'pragrnatic cornpetence'. They

consider pragmatic competence to be part of the learner's knowledge of the language together with 'grarnmatical competence'. In this way, they abandon the Chomskyan view of pragmatic aspects as part of the leamer's performance and, therefore, excluded from hislher competence. Although Bialystok and Sharwood-Smith still posit two dimensions of language proficiency (knowledge and control procedures), they are closely related. This relationship is defined by the authors in terms of what could be called 'the library metaphor':
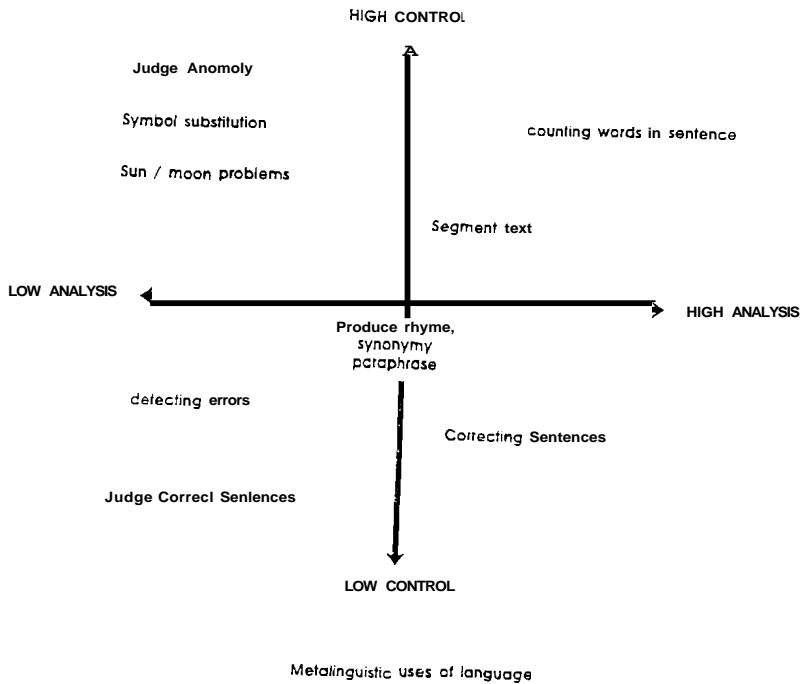
> The language user's mental library may be said to contain a number of books as part of its stable repertoire (i.e. information in long-term storage). These books are not treated as totally unrelated units, but are arranged together in some system[4] [...] The library user and language user needs to know the required procedure for obtaining information - what is necessary, for example, to get information on weight-lifting, yoga, a given author, etc. The user has to know which volumes (i.e. linguistic units and structures) will contribute to what goal, where they may be found, and how to get them out efficiently (i.e. with speed and without undue effort)[5]. (Bialystok & Sharwood-Smith 1985: 105)

This framework is also used to understand language variability. According to Bialystok (1982), variability in IL performance is due to the way in which different tasks and routines place differing demands upon the leamer's knowledge andlor upon the control system. For instance, learners may "know" a TL rule because they have studied it or learnt it, but under communication pressure they may not have enough time to retrieve it. In terms of the 'library metaphor' we can say that the book is in the library, but they do not have enough time to find it. Learners will, therefore. only be able to function in a situation when those situational demands are met by hislher competence within the two dimensions.

This is related to a basic tenet of Cognitive Linguistics: linguistic structures are not just "generated" following some combination of syntactic categorical requisites (that is, either you know the rule, and are therefore able to generate the correct forms, or you do not know it. and cannot), but are rather part of a larger knowledge structure, a "schemata", which includes more information than merely formal requisites: facts about use (i.e., performance) are included in cognitive-style linguistic structures. It is this richer set of possibilities that Bialystok's study acknowledges and includes accordingly in her explanation.

Bialystok (1991) suggests that the demands of a variety of language uses can be quantified by plotting them along two orthogonal axes which represent the two processing components of "analysis of knowledge" and "control". Each axis marks increments in the demands placed upon each of two components. Which tasks we expect leamers to master depends on the learner's competence within the two dimensions. Language proficiency will develop from those tasks or language uses requiring low analysis and control to those requiring high analysis and control.

Figure 3.1

HIGH CONTROL

Judge Anomoly

Symbol substitution

counting words in sentence

Sun / moon problems

Segment text

LOW ANALYSIS   HIGH ANALYSIS

Produce rhyme,
synonymy
paraphrase

detecting errors

Correcting Sentences

Judge Correcl Senlences

LOW CONTROL

Metalinguistic uses of language

Bialystok (1991) herself explains this chart as follows:

> Positing levels of analysis along the x-axis and levels of control along the y-axis, the
> Cartesian space created by these axes indicates positions jointly described by the two
> skill components. These co-ordinate positions provide a means of representing
> developing language proficiency. Children's language acquisition generally progresses
> from oral-conversational uses of language, to the literate uses of reading and writing,
> and finally to the more metalinguistic uses required by tests and special types of
> problem solving. (p.123).

Bialystok (1982) reports two studies undertaken to investigate the role of these two
skill components in the performance of second-language leamers. First, she studied the
performance of 134 adults learning English as a second language (both intermediate and
advanced) on four tasks: a written multiple-choice task, a written discourse completion task,
a structural oral-interview role play and an unstructured debate on an assigned topic. The
discourse and interview were assigned three different scores assessing three different aspects
of the response: a) the ability to recognize target versus non-target forms (T-score), b)
syntactic accuracy (S-score); and c) contextual appropriateness (C-score). The tasks and the
scoring procedures were designed to vary systematically the two factors underlying the
leamer's performance: degree of analysis of knowledge and automaticity of retrieval

processes.

	MC Test (SE)	Discourse completion (DIST)	Interview role play (INTT)
	+ Analysed -Automatic		
T-Score: Ability to recognize target vs non-target		+ Analysed + Auromanc	-Analysed + Auromaric
Sscore: Syntactic accuracy		+ Analysed -Automatic	+ Analysed + Auromaric
C-score: Contextual appropnareness		+ Analysed -Automatic	-Analysed -Automatic.

Table 3.1. Knowledge and processes claimed ro underlie scores on three tasks
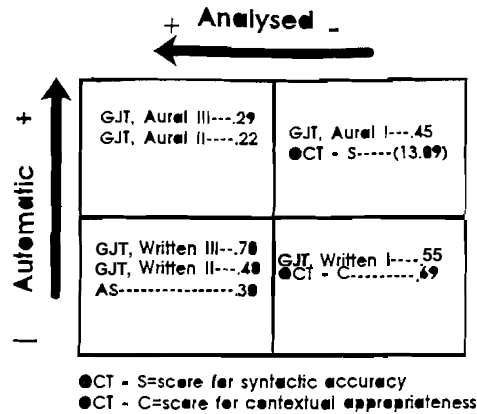Tarone's adaptanon from Bialysrok 1982. (Tarone 1988:75).

In order to support Bialystok's assumptions as to underlying knowledge and control processes, one might predict a high degree of correlation between the scores sharing the same underlying characteristics.

However, such pattern did not emerge. While the scores on all three tasks correlate with each other for the intermediates, for the advanced learners oniy the scores which captured the most similar aspects indicated related performance. For example, the T-scores and C-scores on the discourse and interview tasks did not correlate with scores on the multiple-choice test for the advanced group.

Nevertheless, Bialystok did not reject her assumption of the structure of underlying knowledge and processes. She rather argued that the advanced learners' knowledge was in fact qualitatively different. She claimed that advanced learners were developing the different types of knowledge differentially, resulting in less consistency of scores across tasks. On the contrary, the intermediates' performance was consistently low because they had *"not yet begun to show specialization of knowledge in the two ways indicated by the factors analysed and automatic"* (Bialystok 1982:192).

Because of the exploratory nature of the experiment, Bialystok (1982) carried out a second one reporting only on advanced learners. Again, each of the tasks was classified in terms of the categories " +/- analysed" and " +/- automatic". The tasks were: an abstract sentence (AS) task, an oral cornrnunication task (OCT) and three versions of a grammaticality judgement task (GJT) in both a written and an aural format.

Figure 3.2.

+ Analysed _

GJT, Aural III----.29
GJT, Aural II----.22

GJT, Aural I---.45
●CT - S-----(13.09)

GJT, Written III--.70
GJT, Written II---.40
AS----------------.30

GJT, Written I----.55
●CT - C...........69

Automatic + / −

●CT - S=score for syntactic accuracy
●CT - C=score for contextual appropriateness

Placement of tasks on matrix with factors Analysed/ Automatic
and mean scores obtained
(Bialystok 1982:197)

In the light of these results, Bialystok drew some conclusions regarding both the qualitative nature of the learner's knowledge and their proficiency progress. Since only the mean scores on tests within each cell in the "analysed" colurnn were significantly correlated, she concluded that learners had gained control over " + analysed" forms of knowledge and could therefore use them appropriately in tasks requiring analysed knowledge. Moreover, the fact that scores in the " **+** analysed, **+** automatic" cell were lower indicates that these tasks were, in fact, more difficult to solve and would be, therefore, mastered later than those requiring marked information on one factor only or those which did not require marked information.

Bialystok's model has been criticized by a number of authors (e.g. Chaudron 1983, Lund 1986, Tarone 1988), who have claimed that her classification of the tasks is arbitrary. Tarone (1988), for example, argues that Bialystok does not clearly 'operationalize' the distinction " +/- analysed". She outlines that in Bialystok's first experiment (i.e. Bialystok 1982), her requirements for " + analysed" can be formulated simply as "focused on form", being possible to explain her ordering of the tasks in terms of a continuum, from the task requiring the most attention to form (i.e. the multiple-choice test) to the task requiring the least attention to form (i.e. the unstructured debate). For Tarone (1988:76), "automaticity" is, nevertheless, clearer since "tests are ' + automatic' for the most part when they allow a great deal of time". Surprisingly, Tarone seems to make a mistake here regarding ' + automatic' tests, since Bialystok (1982: 193-4) assigns the label ' **+** automatic' to those tasks which, allowing little time, demand fluent access to the information.

However, despite the conceptual difficulties with the qualitative description of task demands, Bialystok's method still seems to have several advantages over the reviewed ones. First, as Tarone (1988) mentions in her revision of Bialystok's theory, this model could easily account for those data showing, as in Tarone (1985) or Liceras (1987), that some rules are less accurate on grarnmaticality judgement tasks than in actual performance: such rules would be less analysed (in the knowledge base), but more automatic (in control). In this way, Bialystok's model accounts for the data in a single explanation when Tarone needs to resort

to function-form accounts of IL variation in addition to the factor of "attention to form". And secondly, Bialystok's specification of the cognitive processes underlying variation provides the explanatory factor which, in combination with the task demands, establishes what there is in the situation and in the learner's mind that causes him to pay attention to speech and, therefore, to style-shift.[6]

Moreover, as Bialystok and Sharwood Smith (1985) state, psychological processing models differ from "Labovian" ones in that the former take into account the demands that using an imperfectly acquired language impose on language learners. Arguing that native speakers know more than language learners is not enough to discover the underlying principles of IL variation. We also need to determine the nature of the differences in knowledge taking into account the differences in available resources. Thus, Bialystok's (1982) experimental framework proposes to investigate empirically not only the constraints that operate to produce variability at a given point in time, but also the systematic development of such variability by using learners at two different levels and a native control group. This assumption that the learner system changes as he/she develops more extensive representations of the TL in terms of both analysis and control, is interesting for a theory of language which integrates the formal mastery of linguistic features and the applicability of those features to certain functions. If the advanced students in Bialystok's study used the structures in a different way from native speakers even when both groups showed similar grarnmatical competence, it must be that native speakers knew something about how to use the rule that advanced learners did not. A linguistic description in terms of style or context, such as that of Tarone's capability continuum helps to give an accurate account of language variability and the orderliness of the leamer's developing competence. However, in order to get some information about the nature of such orderliness, it seems useful to follow Bialystok's description in terms of the mental processes underlying language learning and use.

IV. THE EXPERIMENT

IV.1. AIM

In order to examine the issue of variability and its role on the development of the leamer's IL, we propose to apply Bialystok's framework for analysing the way in which different tasks place different demands upon either the knowledge and/or upon the control system.

IV.2. TASKS

Our experiment tested 52 learners of Spanish (both intermediate and advanced) for their mastery of 4 Spanish conjunctions across four tasks varying their demands for analysis of knowledge and control of information. These tasks were:

A. THREE VERSIONS OF A GRAMMATICALITY JUDGEMENT TASK (GJT):

I.   Judging correct sentences (GR/GR);
II. Judging incorrect sentences (UNG/UNG);
III. Correcting ungrammatical sentences (UNG > GR) and;

B. AN ORAL TRANSLATION TASK (OT)

Analyses of the tasks reflect the relative matrix position of these tasks along two orthogonal axes which represent the two processing components of "analysis" and "control". This matrix position defines the skill involved in performing these tasks according to Bialystok's predictions:
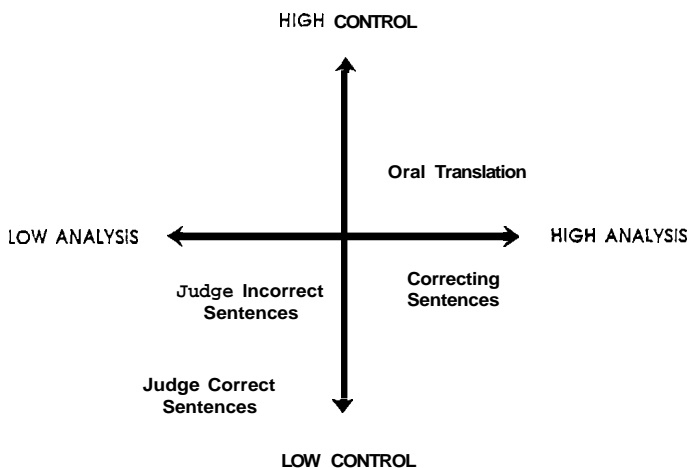
HIGH **CONTROL**

Oral Translation

LOW ANALYSIS ← → HIGH ANALYSIS

Correcting Sentences

Judge Incorrect Sentences

Judge Correct Sentences

LOW CONTROL

Figure 4.1. Placement of tasks on matrix according to their demands on both Analysis/Control (adapted from Bialystok 1991:125&131).

Thus, by positing levels of analysis along the x-axis and levels of control along the y-axis, the Cartesian space which is created by the two axes reflects the positions of the tasks jointly described by the two skill components. Such a framework describes, therefore, four major regions. Although the skill components are considered to be continua and not categories (in line with cognitive linguistic postulates of language), Bialystok (1982) considers empirically useful to represent these regions as sharing certain features so that certain generalizations can be made across a range of values. For both factors, the positive value is considered to be marked with respect to the negative. In this way, high levels of analysis (+A) are marked with respect to low levels (-A) and high levels of control (+C) are marked with respect to low levels (-C). The four regions would be thus be characterized as: 1. (-A -C); 2. (+A -C); 3. (-A +C); 4. (+A +C).

Within this framework our experimental tasks would be described as follows:

GR/GR	UNG/UNG	UNGR > GR	OT
-A	+A[7]	+A	+A
-C	-C	-C	+C

Table 4.1. Knowledge and processes claimed to underlie performance on the four tasks.

IV.3. HYPOTHESES.

The following hypotheses follow from this framework:

1. Advanced leamers will have more knowledge, both in terms of analysis and control, and should, therefore, perform bener than interrnediate students over the whole range of tasks.

2. By analysing the demands on analysis and control made by each task and the leamer's response to these demands, we will establish an order of difficulty of the tasks, which reflects the development of the learner's ability to master tasks requiring increasingly higher levels of both analysis and control. Learners should thus begin by mastering tasks which require low levels of both skill components, then succeed in tasks which increase their dernands on one factor oniy, and finally master tasks for which high levels are required on both factors:

GR/GR	UNG/UNG	UNG > GR	OT
-A	+A	+A	+A
-C	-C	-C	+C

Table 4.2. Predicted order of task difficulty in terms of the tasks increasing demands on both Analysis and Control.

3. Although the structures required to carry out the tasks are the same, leamers will appear to govem those stmctures oniy when their level of both analysis and control of the linguistic forms rnatches the task demands. Thus, if an analysed concept of the rule formation for the conjunctions is required (for example, in restating a sentence with **"pero"** as a sentence with **"sino"** in the correction task), then an unanalysed concept of the rule will not be adequate to provide the correct answer.

IV.4. METHOD

IV.4.1. TARGET FORMS

In order to respect the need to work within a linguistically defined area, we selected for study four linguistic forms - pero/sino/sino que/excepto - which are not only related by

the contrastive function they perform in Spanish, but also by the fact they all translate English **"BUT"**.

IV.4.2. SUBJECTS.

The study was conducted with a total of 62 subjects. Of these 10 formed a control group of native speakers of Spanish staying in England either as teachers of Spanish or students in a University Business Degree Exchange. The other 52 were adult learners of Spanish recruited from students of the Bachelor Degree in Modern Languages (Spanishí Frenchí German) at the Manchester Metropolitan University.

All subjects were roughly equivalent in age and education. However. in order to investigate whether task variation develops systematically or not along the route of development, the subjects were selected from two different levels in their fourth-year course: 26 second-year students (intermediate level) and 26 fourth-year students (advanced level).

IV.4.3. DESIGN AND PROCEDURE

IV.4.3.1. DESIGN

The experimental framework was double x sectorial with variation in task. Subjects at two different levels of performance were asked to perform two tasks:

A. **A written "grammaticality judgement task"** consisting of 132 Spanish sentences. Subjects were asked to tick any sentence they considered grarnmatically acceptable and to correct anything wrong they found in the sentences. Correction was requested as opposed to simple discrimination of errors in order to get a better picture of the level of the learners' analysis of knowledge: while judgements of overall grammaticality are carried out intuitively and do not require analysed knowledge (Bialystok 1979, 1982), correction requires understanding of the linguistic forms in order to detect and correct deviations. Therefore, correction seems to demand a higher level of analysis of knowledge (Bialystok 1979) and increased reliance on executive processes (Anderson, B. 1975).

The items were organized into three sets of oppositions, depending on whether the use of one or another conjunction was semantically, syntactically or pragmatically determined.

A.1. **The first** set consisted of 36 sentences illustrating the semantic opposition between **pero/sino/excepto**. In order to ensure the purely semantic character of the opposition, all the sentences followed the same syntactic pattern, that is, < *negative + conjunction + affirmative* >. Out of the 36 sentences, each conjunction appeared in 12 sentences, 4 grammatically correct and 8 ungrammatical ones. The ungrammatical sentences followed the same pattern and vocabulary as the grammatical ones but they presented the wrong conjunction. Correcting these sentences therefore involved substituting the right nexus for the wrong one. For example, out of the 12 sentences offenng **"sino",** 4 were grammatically correct, 4 wrongly offered "pero" where "sino" should have appeared, and 4 offered "excepto" where "sino" should have been supplied :

E.g.   *No quen'a ir al cine sino al teatro.*
       No quería ir al cine pero al teatro. *
       No quen'a ir al cine excepto al teatro. *

Once they had been elaborated, they were randomised through the test. In this way, one would predict that if leamers knew "sino", they would be able not oniy to recognize it in the grammatical sentences, but also to supply it, instead of the other two, in the ungrammatical ones.[8]

The same pattem of elaboration was followed in the other sets of oppositions, with the difference that oniy two items were contrasted in each one.

A.2. In the syntactic or grammatical opposition, **"sino/sino que"** were contrasted. This time only 8 sentences were elaborated with each conjunction, **4** gramatical and **4** ungrammatical ones. The purpose of this opposition was to check if the leamers knew the gramatical rule that governs the use of "sino/ sino que" in the same semantic context. Such a rule could be stated in the following way:

< neg. ------- sino + phrase (no finite verb)>
e.g. No estaba llorando sino riendo.
< neg. ------ sino que + sentence >
e.g. No estaba llorando sino que estaba riendo.

A.3. Finally, a pragmatic opposition was elaborated: **"pero/sino".** The purpose of this section was to find out whether the leamers knew that when the conjunctions link speech acts, **"pero"** is used as opposed to "sino". Due to the pragmatic character of this opposition, when necessary, we included sentences which provided a context that helped to clarify the way "pero" links its sentence to the previous speech act:

e.g.   **A.** *"Los alemanes visten muy mal"*
       B. "Pero fíjate en ese que viene por ahí. Va muy elegante."

B. The Oral Translation Task consisted of oniy **24** English sentences of which **4** were distracters which required a translation of "but" different from "pero/sino(que)/excepto". The other **20** sentences studied just two sets of those oppositions analysed in the written task. These were, namely, the semantic opposition **"pero/sino/excepto"** and the syntactic **"sino/sino que".** The pragmatic opposition **"pero/sino"** was left out because it required the creation of a previous context which would have probably resulted in lack of spontaneity. Moreover, the reduction of sentences from the grammaticality test was necessary since, having done a pilot test with **4** students, we realised that the learners got tired after translating approximately **20** sentences.

Unfortunately, due to lack of space, we have not been able to include a sample of the tests in the appendix. Although we are aware that a sample would have clarified the design of the tasks, the description of the experiment had to be inevitably reduced.

IV.4.3.2. PROCEDURE

A. For the **written grammaticality test 62** subjects **-10** native speakers and **52** second language leamers- were selected randomly since they were asked to perform the test voluntarily. The two groups **-26** intermediate and **26** advanced students- were allocated in two

different rooms.

Subjects were first given the first part of the test - 94 sentences illustrating the semantic and gramatical oppositions- and were asked to read the instructions carefully before staning. As soon as they performed the first pan, they were given the second one, that is, the sentences on the pragmatic uses of the conjunctions. Students were asked to write their narnes in case of any problem. However, despite the fact that they were told that the experiment was anonymous, fourth year students refused to write their names since they felt their performance was very poor.

B. Out of the 52 students, 12 were selected from each group for the **Oral Task**. Translations were recorded individually and subjects were given instructions to provide a spontaneous and fast uanslation. It was assumed that by increasing the time constraints, we would also increase the processing demands on the learners' control of information with respect to the written grammaticality test, for which we imposed no time restrictions. Although we are aware that the study of free speech would have probably been more desirable, we unfortunately lacked the very large amount of time which would have been required to record the subjects' free production of the forms. Moreover, we found that the use of a translation task was also very interesting from an empirical point of view. To our knowledge, at the time our experiment was carried out oniy a few studies had compared performance on a translation task to any other tasks (see LoCoco 1976, Liceras 1987). Interestingly, the oniy study which had compared explicitly gramaticality judgements to translation skills (i.e. Liceras 1987) reponed more approximation to TL forms in the translation task. Our hypothesis held, nevenheless. opposite predictions.

IV.5. RESULTS

In order to facilitate the presentation of the results, percentages were displayed in 10 tables which are included in the appendix. References to the tables will be made throughout the discussion. The analysis of the results will be divided into three different sections, according to the predictions of the hypotheses.

IV.6. ANALYSIS OF RESULTS

IV.6.1. PERFORMANCE BY GROUP

In this first set of analyses, we have compared the scores obtained by each group across tasks in order to check the progress of knowledge in terms of task variation. (see Table 2).

The results show that, as predicted, native speakers performed better than advanced students and these, in tum, better than intermediate across the whole range of tasks. The three groups were, in fact, ordered in their overall ability to deal with the experimental tasks. So far, as Bialystok (1982) points out, the higher scores of advanced students can be explained by quantitative assessments of proficiency, which predict that advanced students will perform better because they know more. However, such an explanation does not account for differences across tasks. Whereas a quantitative notion of proficiency would predict

equivalent performance across tasks for a given learner or level, our results illustrate task variation not only across groups, but **also** within groups. While the intermediate group has not yet **mastered** the correction of ungrammatical sentences , the advanced group has already reached the 50% **level**. We, therefore, conclude with Bialystok (1982) that not only do advanced **students** know more than intermediate, but they **also have** more knowledge under analysed and automatic control and so perform differently over the whole range of tasks.

IV.6.2. PERFORMANCE BY TASK TYPE

In this section, we analysed the results displayed in Table 2 and Table 3 in order to test Bialystok's hypothesis that mastery proceeds by the development of two component processes: analysis of knowledge and control of information. As we previously mentioned, the assumption is that language learners will advance **through** different language uses as they increasingly master these two processing components. She predicted that learners will initially be able to **solve** tasks characterized by relatively low demand values for the two processing components, and will progressively advance to more difficult tasks with advances in their mastery of analysis and control. Thus, **taking** into account the processing difficulty predicted for our experimental tasks in terms of their position along the two axes of analysis and control (see Figure 4.1), we expected learners to **solve** our experimental tasks in the order presented in Table 4.1.

However, our results did not **confirm** this hypothesis (see Table 3 in appendix). Contrary to our expectations, learners seemed to find the correction task more difficult than the oral **translation**.[9] The order of difficulty of the tasks was in fact the following:

GR/GR	**UNG/UNG**	OT	**UNG > GR**
-A	+A	+A	+A
-C	-C	+C	-C

Table 4.3. **Reported order of task difficulty** in terms of the tasks **increasing** demands on both **Analysis and/or** Control.

In terms of Bialystok's hypothesis, we would therefore predict that learners would begin by **gaining** control over tasks requiring relatively low levels of both analysis and control (**GR/GR** and **UNG/UNG**), and then master tasks which impose high demands on both factors (OT) before tasks which impose high demands on one factor only (**UNG > GR**). However, such an assumption contradicts Bialystok's (1982) hypothesis that tasks marked for one factor only, that is tasks which impose relatively high demands on one factor only, would be **mastered** before tasks marked for both **factors**. In the light of these results, we must, therefore, conclude that either Bialystok's predictions for proficiency development in terms of the task demands for increasingly marked information on both analysis and control is empirically inadequate; or the description of the processing demands imposed by the tasks under investigation is not appropriate.

Before disregarding Bialystok's frarnework, we decided to check the marking of our experimental tasks. In general, **it** would seem difficult to argue that translation as an activity is less difficult than **grammatical** correction. However, the fact that most learners admitted

to **have** found the GJT more difficult than the translation task made us **think** that this particular one may be. Even native speakers, when asked **after** the experiment, affirmed to **have** found the GJT more difficult than the OT task.

The assumption is that this specific oral translation required either less control or less analysis of knowledge than our correction task. It would in fact seem very difficult to **argue** that the correction task demanded higher control than a task such as our oral translation. which was carried out under specific time restrictions. However, it may well be that the correction task demanded a more analysed knowledge of the **conjunctions** than this particular oral translation. In fact, Bialystok **does** not specify that simultaneous translation requires higher analysis than correction. Her analysis of both tasks is carried out separately on two different diagrams: whereas the correction of sentences is described in the processing framework for metaiinguistic uses of language (see Bialystok 1991:**131**), simultaneous translation is described **with** other oral uses (see Bialystok 1991:125).

Both translating and correcting require a detailed analysis of the meaning and the structure of sentences; the former in order to "translate from one language to another", the **latter** to "convert an ungrammatical sentence into a **grammatical** one". However, when students are prompted to translate automatically, as **in** the case of translating simultaneously or in our OT task, they are not given enough time to analyse the sentences. In these cases, the tasks rely primarily on the students' control of the structures. But, even if we **assume** that our correction task required higher analysis than our oral translation, Bialystok's predictions are still unverified. The translation task is still assumed to require high control and high analysis as opposed to the correction task, which may demand higher analysis but low control. Students are therefore still reported to master a task imposing high demands on both factors (OT) before a task requiring high demand values on one factor only (UNG > GR). We thus conclude that, according to our results, Bialystok's predictions for proficiency development in terms of increasingly marked information on both factors are inadequate. In our experiment the determinant factor for task difficulty seems to be the required level of analysis of knowledge rather than demands on both **factors**. The subjects found the task which required the highest level of analysis more difficult to perform than the OT, irrespective of the high level of control demanded by the laner. In order to investigate the reasons for such a performance, we will examine in the next section the nature of the learners' knowledge of the conjunctions in terms of their ability to match the demands imposed by the different tasks.

IV.6.3. **RELATIVE** PERFORMANCE BY TARGET FORM

Our third hypothesis predicted that learners would be able to master the linguistic forms only when the task demands match their **competence** levels of analysis **and** control for those structures. In order to test this hypothesis, we calculated the percentages each group obtained for each target form across **all** tasks (Table 4).

A. We first considered the semantic opposition between **pero/sino/excepto**. Concerning our first hypothesis, we discovered that in general advanced students performed bener than intermediate learners **in** every task. However, by comparing the leamer's performance on each form, we discovered **three** cases in which intermediate students displayed a higher or at least the same percentage as the advanced learners'. One example

was the recognition of grarnmatical sentences with **"sino",** where intermediates performed a little higher than advanced learners. This was not, however, considered to be especially relevant since the difference was very small and, as we previously pointed out, the performance in "sino" was affected by the learners' confusion with "pero sí" (see note 8). The other two examples reflected the intermediate learners' higher performance in the OT task for **"pero"** and **"excepto".** If we compare the scores with the task demands, we will be able to see that the OT task is the only task requiring + control (see tables 4.2 and 4.3). Thus, it is possible to hypothesize that the intermediates' rules[10] for "pero" and "excepto" have similar control levels to those of the advanced students, and that is why both groups performed well in the OT task; but are much less analysed, and that is why they performed lower in the task requiring the highest level of analysis (i.e. the correction task).

Regarding the transferability of each form across the tasks, there were also some variations from the general pattern reported in the section investigating the relative performance by task type. As we would now expect, given the results displayed in tables 2 and 3, it would be easier to judge the un-/grammaticality of each form than to translate them. Correcting would nevertheless be the most difficult task for each form. However, two exceptions to this pattern were detected with regard to **"pero".** One was found in the advanced group, who could identify "pero" better in the translation task than in ungrammatical sentences. The other appeared in the intermediate group, who scored higher in "pero" in the OT task than in any version of the GJT, including judgements of grammatical sentences.

These results are very difficult to explain. The fact that both groups showed a similar behaviour suggests that there must be some kind of systematic underlying principle. However, the explanation of this variation in terms of the processing demands imposed by the tasks is hard to ascertain. If, as we assumed, the OT task imposes higher demands on both analysis and control than making judgements of grammaticality, students should then perform higher in judging the sentences. This finding could oniy be explained in terms of the task demands by assuming that this specific OT task required less analysis than the UNG/UNG task, but this seems rather unlikely. We then looked for possible linguistic reasons which might have caused such a behaviour, but we could not find any. The linguistic context of the sentences with "pero" was similar to the context of the sentences with "sino" and "excepto". We finally decided to examine the subjects' erroneous performance (see Tables 1 & 5). A look at table 5 enabled us to realize that the subjects translated "but" as "pero" not oniy when it was the right thing to do, but also when "but" should have been translated as 'sino" (Advanced=*39.5%; Intermediates=*64.5%). The students, not having organized yet the distinction between "pero" and "sino", tended to translate "but" as "pero" in all the cases they were uncertain about.

"Pero" was probably the first conjunction they learnt. When learning Spanish as a foreign language, English students soon learn "pero" as the translation of English "but" without any explicit grammatical explanation. Then, they start to supply "pero" in any of the contexts in which English "but" appears until such a substitution becomes consolidated. Later on, when students are also taught "excepto" and "sino" as possible translations of "but", they have to restructure the information they had already stored (i.e. that "but" was always translated as "pero") and assimilate the new structures. Our assumption is that at the time this experiment was carried out, the students were still uncertain as to when they should use each form.

We also compared pero/sino/excepto in order to establish an order of difficulty of the conjunctions. Interestingly, the order of difficulty slightly varied across tasks and groups.

ADVANCED   **INTERMEDIATE**

GWGR	UNG/UNG	OT	UNG>GR	GWGR	UNG/UNG	OT	UNG>GR
-A -C	+A -C	+A +C	+A -C	-A -C	+A -C	+A +C	+A -C
pero *excepto* *sino*	*pero* *excepto* *sino*	*pero* *sino* *excepto*	*pero* *excep.* *sino*	*excepto* *pero* *sino*	*pero* *excepto* *sino*	*pero* *excepto* *sino*	*excepto* *pero* *sino*

Table 4.4. Order of difficulty of the conjunctions in each task as a function of their demands on both Analysis and Control.

A look at the figure above enables us to realize three changes in the general order of difficulty: one in the advanced group with the performance of "sino" surpassing that of "excepto" in the OT; and two in the intermediate group, who scored higher in "excepto" than "pero" in the GR/GR and the UNG>GR tasks.

The changes in the intermediate students' performance seem to show that this group is still sorting out the distinction between "pero" and "excepto" since there seems to be no correlation between the demands imposed by the tasks and the use of the conjunctions. However, the change in the advanced group can be explained in terms of the task demands on the two processing factors of analysis and control. As we can observe in the table above, the change in the advanced group took place in the OT task, which is the only task which requires a high level of control (+C). We can therefore hypothesize that the advanced learners performed higher in "sino" than in "excepto" in the OT task because the rule they possess for "sino" is more automated than the rule they possess for "excepto". The advanced students may use "sino" more frequently than "excepto" in everyday conversation, having, therefore, an easier access to the rule.

To finish the analysis of pero/sino/excepto, we studied the learners' performance in the correction task in order to establish an order of difficulty in terms of functional oppositions. A look at table 5 reveals that both groups found it easiest to distinguish **pero** and **excepto,** then **sino** and **excepto,** and finally **sino** and **pero.** If we assume that this order of difficulty corresponds to an order of acquisition, we can thus establish that learners first managed to distinguish pero and excepto, then, managed to differentiate sino and excepto; and finally succeeded in distinguishing sino and pero. From these results, it is possible to hypothesize that "sino" is harder to distinguish for intermediates because they have not yet developed enough analysis or control of the rule to meet the demands of the OT or the correction task. Similarly, advanced students find it more difficult to distinguish "sino" from the other two conjunctions because they still have not gained enough proficiency of the rule in terms of analysis of knowledge.

B. Secondly, we analysed the syntactic opposition between **sino/ sino que** (see Table 6).

As far as quantitative differences between the two groups are concerned, as in the previous opposition, advanced learners performed higher than intermediates in every task. Furthermore, there were also qualitative differences in the knowledge displayed by each group. Thus, whereas the advanced learners' performance was below average in two tasks for "sino" and two for "sino que", the intermediate group neither reached the average level in three tasks for "sino" nor in three for "sino que". These results confirmed again the initial hypothesis that advanced learners not oniy know more than intermediates, but also have a qualitatively different command of that knowledge.

Moreover, the results in this section also confirmed the now familiar order of task difficulty (GR/GR ·· UNGIUNG ·· OT ·· UNG > GR) reported in the semantic opposition between pero-sino-excepto. This result seemed to indicate that the task demands remained the same irrespective of the linguistic characterization of the terms under analysis. However, as far as each linguistic form is concerned, there were some variations from this order. The subjects' performance in "sino que" was better in the correction task than in the OT. In terms of the proposed framework, this result can be explained in terms of the mismatch between the subjects' low control of the rule for "sino que" and the high level of control required by the OT task.

Suppose the subjects have oniy recently learnt the grammatical formation rule for "sino que" through formal instruction, but have still not had the opportunity to practice that rule in conversational uses of language which require a great effort to retrieve that rule. The subjects would thus lack the necessary control of the rule to efficiently meet the demands of the OT task, which requires an automatic retrieval of information. But the learners' knowledge of the syntactic opposition "sinolsino que" is not oniy low in control, but also in analysis. The fact that they perfonned below average even in a task such as UNGIUNG, which is characterized by relatively low demands on analysis and very low demands on control, indicates that they neither know the rule nor how to use it. The learners seemed to have greater difficulty mastering the syntactic differences between these two terms than the semantic aspects of the previous opposition pero/sino/excepto. However, we did not find any qualitative difference in the learners' command of the semantic and syntactic rules, that is, in how they applied those rules to situations varying in their demands for analysis and for control of those rules.

C. To finish the analysis of the results, we shall briefly comment on the pragmatic opposition pero/sino, which we did not include in the translation task for the reasons already mentioned (see IV.3.1: design of the oral translation task).

C.1. Although we initially introduced the opposition pero/sino in order to check any possible differences between the three different functions (i.e semantic, syntactic and pragmatic) it did not develop our hypotheses any further. In fact, with the exceptions already outlined, the same pattern appeared in the three oppositions: advanced learners performed better than intermediates and both groups displayed the same pattern of task variation, that is from the recognition of grammatical sentences to the correction task, the only difference being that the OT was not included in the opposition pero/sino. The surprising fínding in this opposition was that advanced students seemed to master "sino" better than "pero" while the intermediate group performed better in "pero" than "sino". Nevertheless, the percentages in both conjunctions are so close that is difficult to draw any definite conclusion on the order of diffículty of the conjunctions.

By comparing the percentages in the three sets of oppositions, it seems that the learners in general **mastered** the semantic opposition the best, then, the pragmatic one between **pero/sino** and finally, the syntactic distinction between **sino/sino** que. **This** in fact seems to agree with the assumption of those researchers that affirm that semantics **takes precedence** over syntax (Miller 1967, Osgood 1968, Anderson & Bower 1973). However, as far as our hypotheses are concerned, we **observed** no **significant** differences between the learners' cornmand of knowledge in the three oppositions, since the same pattern of task variation was observed in the three sets of oppositions. The **subjects** appeared to apply their knowledge of the **conjunctions** to the different tasks in a similar way, irrespective of the linguistic characterization of such knowledge.

IV.7. CONCLUSIONS.

Some of the events we interpreted when dealing with the analysis of the results **have important** consequences for a theory of Second Language Acquisition. Following Bialystok's (1982) analysis of data, our results were examined in three sections, in which the **relative** performance across groups, the transferability of knowledge across tasks and the predictability of success on the basis of the task analysis were evaluated.

Regarding our **first** hypothesis, we concluded from the results that having more proficiency **in** a language implies not only having more knowledge in quantitative terms, but **also** being able to use that knowledge in qualitatively different ways. Although the two groups of learners differed from each other with respect to accuracy **in** their use of the **conjunctions,** they showed the sarne behaviour with respect to the "use" of these **conjunctions** across a number of tasks, **i.e.** their cornmand of the forms showed the **same** pattern of task variation (see Tables 2 & 3 in the **appendix**). However, the pattern of task variation for the learner groups was **significantly** different from that of native speakers. Specifically, native speakers performed well in **all** the tasks for each of the **conjunctions.**

A quantitative assessment of the learners' knowledge of the **Spanish** "adversative conjunctions" would not predict the pattern of task variation displayed by the learners **in** the present study. The assumption **is** that there are different ways of knowing and that these differences refer to the uses that can be made of that knowledge. The description of the students' knowledge of the **conjunctions** under study must thus include the description **of** those "ways of knowing" in a systematic and developmental way. Such a description would enable us to explain how learners use that knowledge differently and how they advance to more complex ways of knowing. Whereas the intermediate learners did not master the forms in the correction task, the advanced group had already **started** to develop the ability to correct. Moreover, native speakers **mastered** equally every aspect of proficiency. **If** the advanced students were able to use the linguistic forms **in** different ways from the intermediates, it must be that they "knew" something about the forms that intermediates did **not.** Similarly, if native speakers succeeded in every situation, **it** must be that **some** information about the forms was available to them, which was not accessible to advanced or intermediate learners. In order to explain the differences between the groups, we need a description which refers not only to how much knowledge they possess, but **also** to how that knowledge is represented in the learners' minds.

In this paper, we **have** presented Bialystok's (1982,1991) model for such a qualitative description of knowledge. This model is based on two underlying **psycholinguistic** dimensions which describe different aspects of the leamer's knowledge of the language :

    a) the extent to which the knowledge is analysed,

    b) the extent to which that knowledge is **accessible** (that is, the degree of entrenchment).

Each dimension constitutes a continuum along which the leamer's proficiency of the language develops by gradually achieving higher levels of analysis and control.

The second section of the results tested the applicability of such frarnework to the explanation of task variation. The assumption was that the use of a language in different situations **inherently** demands greater or **lesser** levels of analysed knowledge and of control, and that the leamer will be able to function **in** a situation oniy when **his/her** state of knowledge **in** terms of the two processing factors can meet the situational demands. The implication for the development of proficiency is that tasks imposing low demand values on both dimensions will be **mastered** before those requiring relatively high demands on oniy one factor and these, **in turn,** will be **mastered** before tasks **highly** demanding on both **skill** components.

In order to investigate this assumption, we compared our subjects' performance to the demands Bialystok (1982, 1991) **attributes** to the **following** tasks:

    - judgements of grammatical sentences. (-A -C)

    - judgements of **ungrammatical** sentences or detection of **errors**. (+A -C)

    - correction of **errors**. (+A **-C)**

    - oral **translation.(+**A **+**C)

However, the results were not straightfonvard and Bialystok's predictions were oniy **partially confirmed**. As we hypothesized, the subjects responded differentially and systematically to tasks which varied in their demands on analysis and control. Their performance showed the **same** order of increasing task difficulty **in** both groups (i.e. judgements of grammatical sentences **-** detection of **errors -** oral translation - con-ection). But such an order did not con-espond to Bialystok's predictions for the development of proficiency. The fact that our subjects performed better **in** the OT (+A **+C)** than **in** the correction task (+A **-C)** contradicts Bialystok's assumption that tasks requiring information marked on one factor oniy will be **mastered** before tasks requiring information marked on both **factors**.

These results in fact suggest that Bialystok's predictions were wrong either in the demands attributed to the tasks under investigation or in her assumptions for the development of proficiency. It is possible that, for reasons **unknown** to us, the particular OT task we designed for this experiment demanded low levels of analysis of knowledge, being therefore described as (-A **+C)**. This would thus support Bialystok's (1982) assumption that tasks requiring analysed knowledge are more difficult than those requiring **unanalysed** knowledge. However, it is **also** possible that Bialystok's predictions for the development of proficiency are wrong in that tasks imposing demands on one factor **only** are not always **mastered** before those which impose demands on both **factors**. In fact, **it** may be that this assumption depends on the state of the learners' knowledge in terms of both analysis and control at the time they carry out the tasks. Suppose that the OT task required, in fact, both high analysis and high control, but **still** required a lower **level** of analysis than the con-ection task. Suppose as well that at the time of the experiment the learners had developed enough analysis and control of

the forms to meet only the demands of the OT task, but not the higher level of analysis required by the correction task. The learners would thus perform better in the OT task than in the correction one. This hypothesis relies on the assumption that mastery proceeds along the axis of analysis and the axis of control independently of one another. Thus, it would be possible for the learners to develop a certain level of analysis of the forms and then automate that knowledge by continuous practice before proceeding to higher levels of analysis.

The pattern of task variation reported in this paper would in fact seem difficult to explain in terms of a "sequence of development" not based on processing skills. Some authors (e.g. Tarone 1985) have described such a "sequence of development" in terms of a syntactic or grammar continuum which is the product of differing degrees of attention reflected in a variety of performance tasks. However, the pattern of variation reported in this paper seems hard to account for in terms of a syntactic sequence of development which would predict increased grammatical accuracy when learners are paying attention to the form of the discourse.

To start with, it is not clear how such a model would account for the differences in accuracy between our experimental tasks, since they all required attention to the form of the discourse. They all focused on correctness of linguistic form and none on comrnunication of subject matter. Secondly, if we are to arrange the tasks in an order of difficulty depending on the degree of attention to form, in order to explain our results, we would have to assume that the learners paid more attention to language form in the OT task than in the correction task. Such an assumption is difficult to sustain when the OT task gave the learners no time to focus on the form of the sentences. Thirdly and lastly, the assumption of a grammar continuum would posit serious problems to account for the fact that our subjects performed differently in different conjunctions under identical task conditions. This finding was reported in the last section of our results where we examined the learners' performance on each linguistic form. We, for instance, found that in the opposition "sino/sino que" each form displayed a different task-variation pattem. While the learners' performance in "sino" decreased in accuracy across the following tasks: GR/GR - UNG/UNG - OT - UNG > GR; their performance in "sino que" was better in the UNG > GR task than in the OT. An explanation in terms of attention to form would thus imply that the leamers' degree of attention to form varied when using different conjunctions. However, there seemed to be no reason why the learners would pay more attention in producing a conjunction such as "sino" than in producing a different one when the task conditions remained the same. A plausible explanation could be found in the different "degree of entrenchment" of each conjunction. However, further empirical research would be necessary to confirm this idea.

Such differences in the patterns of task variation cannot thus be predicted in terms of attention to form as the sole cause of task-related variation. Moreover, they could not even be predicted in terms of any other type of social or discourse explanations. The linguistic context the conjunctions were embedded in was the same in all the tasks and so was the type of discourse required. The leamers were given specific instructions in all the tasks and they all had a similar social and linguistic background. Thus, to explain the reported pattem of task variation from a linguistic, social or situational point of view would seem inappropriate. In fact, the main difference between the tasks lay in the *cognitive operations they required the students to perform*. An explanation in terms of these cognitive operations seems therefore more appropriate than one based on a syntactic sequence of development. On this basis, Bialystok's assumption of two underlying processing factors seems a plausible

explanation.

We are aware that some may argue that the results in this paper initially did not confirm Bialystok's predictions for the relative difficulty of the tasks. However, this framework allows us to explain variation across and within tasks in terms of the leamers' ability to match their knowledge of the forms with the task demands on their processing skills. Moreover, her attempts to empirically validate the two processing components have been supported by experimental works in cognitive psychology, which have also proposed the distinction between two aspects of skill acquisition: the level of mental representations and the level of access to those representations (e.g. Anderson 1980). One may believe our results contradict Bialystok's framework or may attempt to support them by assumptions rooted in her model. There is no easy way to verify inner processes as causes of IL variation. There are still many gaps in our knowledge about the phenomenon of variation in interlanguage. After all, our discussion of the results also represents an attempt to frame the reported evidence into a theoretical model. Most of the assumptions are nothing else than hypotheses waiting to be verified.

But whether Bialystok's model is adequate or not, what is clear is that a satisfactory theory of IL variation must be able to explain how learners use their knowledge of certain language forms differently in different situations. To serve this purpose, such a theory must be based on a notion of competence which takes into account both the formal mastery of linguistic features and the applicability of those features to certain situations. Again this postulate is in accordance with a basic tenet of Cognitive Linguistics:

> Cognitive grammar (…) asserts that linguistic structure can oniy be understood and characterized in the context of a broader account of cognitive functioning. This has the theoretical consequence (which I find neither unnatural nor disturbing) that an exhaustive description of language cannot be achieved without a full description of human cognition" (Langacker, 1987:64).

Our subjects' knowledge of the Spanish conjunctions under study is in most cases sufficient to support oral translation from their mother tongue into Spanish but not to carry out the correction of formal test items. In order to describe such a knowledge it is no longer enough to know whether the learners have been taught "pero/sino/sino que/excepto". Rather we need to know the ways in which the leamers' knowledge of the conjunctions is represented in their minds as well as the conditions under which we expect to see the use of those conjunctions. Bialystok and Sharwood-Smith (1985) outline two implications of this analysis: firstly, that the mastery of linguistic features and the applicability of those features to certain tasks should be empirically distinct. And secondly, that the appropriate use of structures in particular situations should develop systematically, irrespective of structural accuracy. Both implications were in fact observed in our experirnent: Our subjects' command of their knowledge of the conjunctions was not oniy different across various task conditions, but also systematically ordered.

NOTES

[1] A recent contribution which shows the imponance of situationai factors in cognitive linguistic studies is Jordan Zlatev's *Situated Embodiment: studies in the emergence of spatial meaning* (Zlatev, 1997).

2. Although Krashen's theory also emphasizes the role of "cognitive processes" in SLA. for the present purposes I shall here focus my attention on the so-called Psychological Processing Theories, especially on Bialystok's "processing continuum model".

[3] An elaboration of this topic from a Cognitive Grammar perspective is Tuggy (1997) "On the storage vs computation of complex linguistic structures: four maxims".

[4] This assumption of an organized system of knowledge is aiso one of CL main tenets. Cognitive linguists claim that our knowledge is organized by cenain cognitive structures which link together as a system and help us to interpret our experience. The characterization of these structures has varied according to the approach taken (e.g. Fillmore's 'frames', Lakoff's 'ICMs', Langacker's 'schemas', etc.).

[5] Sperber and Wilson (1986) have aiso applied this relationship between knowledge and control to comrnunicative behaviour in terms of what they have called 'the principle of relevance`.

[6] Evidence of the role of attention on the structure of grammar can be found in Talmy (1994), "The Windowing of Attention in Language".

[7] Although Biaiystok (1991:132) places the task of judging incorrect sentences within the Cartesian space described by low levels of anaiysis and control, she indicates that detecting errors requires a higher level of anaiysis than judging correct sentences. In order to represent this difference between the tasks in terms of the analysis of knowledge required, the detection of errors is marked as ($+A$ $-C$). The correction of ungrammatical sentences is aiso described as ($+A$ $-C$). However, this task is predicted to be more difficult for learners than the detection of errors since it requires higher level of anaiysis.

[8] A problem we had to take into account when interpreting the results of those sentences with "sino" was that the percentage was lowered by the fact that all the subjects, including the native speakers tended to supply "pero sí" instead of "sino" in some of the sentences. The reason is that in Spanish, "pero sí" and "sino" can appear in the same syntactic context but differ functionally in that "pero sí" seems to add an emphatic undertone to the sentence. However, when asking native speakers why they had supplied "pero sí", although they accepted the grammaticality of "sino", they admitted to have answered spontaneously, supplying the form they would probably use in everyday conversation. Interestingly, they affirmed not to be aware of its emphatic value when engaged in communication.

[9] Our results agree with those of Liceras (1987), who aiso reponed more approximation to TL norms in the translation task than in the grammaticality judgement test. Her experiment aiso studied the performance of native speakers of English with regard to certain Spanish structures in a GJT and a translation task. Thus, it would be interesting to carry out further investigation of performance on GJT and translation tasks before drawing any definite conclusions on the difficulty of these tasks.

[10] Here the word "rule" does not refer to innate linguistic postulates. On the contrary, it stands for the knowledge of the forms that learners dynamically structure both in terms of anaiysis and control.

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APPENDIX: TABLES

TABLE 1 (GENERAL)

	ADVANCED									INTERMEDIATE								
	GJT							OT		GJT							OT	
	G/G	G/U	?	U/U	U>G	U/G	?	CO%	IN%	G/G	G/U	?	U/U	U>G	U/G	?	CO%	IN%
PERO	94.2	4.8	0.9	77.8	53.8	20.1	1.9	91.6	8.4	87.5	8.6	3.8	68.2	39.9	28.8	2.8	91.6	8.4
SINO	77.8	20.1	1.9	61.0	50.4	37.0	1.9	60.4	39.6	78.8	20.1	0.9	50	35.5	44.7	5.2	35.4	64.4
EXC.	93.2	2.8	3.8	71.6	51.4	25.9	1.4	58.3	41.7	90.3	8.6	0.9	67.7	41.3	27.8	4.3	58.3	41.7
SINO	83.6	16.3	0	52.8	43.2	4.9	1.2	50	50	77.8	19.2	2.8	49.0	28.8	67.9	5.1	43.7	56.3
SINQ	71.5	26.9	1.5	35.8	19.2	45.1	1.9	12.5	87.5	66.9	30.7	2.3	26.9	28.8	49.9	1.9	4.1	95.9
PERO	93.2	5.7	0.9	95.1	81.7	3.8	0.9	-	-	96.1	3.8	0	89.4	72.8.	8.6	0.9	-	-
EXC.	97.1	0.9	1.9	72.1	55.7	26.9	0.9	-	-	95.1	2.8	1.9	64.4	31.9	32.6	2.8	-	-
PERO	82.6	14.4	2.8	52.8	44.2	42.3	4.8	-	-	78.8	19.2	1.9	49.0	39.4	50.9	2.8	-	-
SINO	84.6	13.4	1.9	53.8	45.1	41.3	4.8	-	-	76.9	20.1	2.8	46.1	35.5	45.1	5.7	-	-

G/G: grammatically correct sentences recognized as such.
G/U: grammatically correct sentences wrongly recognized as ungrammatical.
?: no response given.
U/U: ungrammatical sentences recognized as such.
U>U: ungrammatical sentences corrected by inserting the right conjunction.
U/G: ungrammatical sentences wrongly recognized as grammatical.
General description of each group's correct and incorrect performance in each form across all the tasks. For instance, in the task represented as G/G, the percentages reflect the students' ability to recognize grammatical sentences as such. However, in the task represented as G/U, the percentages stand for the number of occasions the students wrongly recognized a grammatical sentence as ungrammatical. Thus, all the percentages under our four experimental tasks, that is, G/G - U/U - U>G - OT, represent the students' correct performance. The rest of the tasks in the table display either the students' incorrect performance - G/U, U/G - or lack of knowledge - ? -.

TABLE 2

	GJT			OT
	GR/GR	UNG/UNG	UNG>GR	CORRECT %
ADVANCED	96.07%	68.7%	50.7%	54.5%
INTERMEDIATE	82.7%	54.2%	40.01%	46.6%
NATIVE	99.4%	99.4%	91.5%	96.6%

Table 2. Correct performance by each group across the different tasks.

TABLE 3

	GJT			OT
	GR/GR	UNG/UNG	UNG>GR	CORRECT %
	84.4%	61.4%	45.3%	50.6%

Table 3. Total correct performance across tasks

TABLE 4

	ADVANCED				INTERMEDIATE			
	GJT			OT	GJT			OT
	G/G	U/U	U>G	%	G/G	U/U	G>U	%
PERO	94.2	77.8	53.8	91.6	87.5	68.2	39.9	91.6
SINO	77.8	61.0	50.4	60.4	78.8	50.0	35.5	35.4
EXCEPTO	93.2	71.6	51.4	58.3	90.3	67.7	41.3	58.3

Table 4. Correct performance by groups on each task for pero/sino/excepto.

TABLE 5

	ADVANCED						INTERMEDIATE					
	GJT			OT			GJT			OT		
	PERO	SINO	EXCEP	BUT = PERO	BUT = SINO	BUT = EXCE	PERO	SINO	EXCEP	BUT = PERO	BUT = SINO	BUT = EXCE
PERO	94.2%	44.2%	56.7%	91.6%	393%	4.1%	87.5%	35.5%	48.07%	914%	64.5%	14.5%
SINO	37.5%	77.8%	46.1%	8.3%	60.4%	35.4%	31.7%	78.8%	34.6%	8.3%	35.4%	20.8%
EXCEPTO	70.1%	56.7%	93.2%	0%	0 9	58.3%	48.07%	35.5%	90.3%	0%	0%	58.3%

Table 5. Description of each group's performance for pero, sino and excepto in the correction and translation task. In the GJT, the forms in the horizontal column represent the total number of sentences which offered pero, sino and excepto in the test. The forms in the vertical column represent the students' ability to either recognize those sentences which offered correct uses of pero, sino, excepto - i.e. the percentages in bold- or to correctly insert these terms when the sentences offered in the test were ungrammatical. For instance, in the advanced group's performance, we are shown that out of all the sentences which offered a grammatical use of "pero", as in the horizontal column, the students were able to detect "pero" as such in a 94.2% of the sentences. Out of all the sentences which offered "pero" but "sino" should have been provided, students correctly inserted "sino" in a 37.5% of the cases. And out of all the sentences which students correctly inserted "excepto" in a 70.1% of the sentences. Similarly, in the OT task the terms in the horizontal column stand for the expected translations of "but" as pero, sino and excepto; and the terms in the vertical column represent the students' actual performance. Thus, out of all the sentences in which "but" should have been translated as "pero", i.e. but = pero, the advanced students actually translated as such in a 91.6% of the cases, but they wrongly translated as "sino" in a 8.3% of the sentences.

TABLE 6

	ADVANCED				INTERMEDIATE			
	GJT			OT	GJT			OT
	G/G	U/U	U>G	%	G/G	U/U	U>G	%
SINO	83.6	52.8	43.2	50	77.8	49.03	28.8	43.7
SINOQ	71.5	35.8	19.2	12.5	66.9	26.9	7.6	4.1

Table 6. Correct performance by groups on all ch tasks for
sino, *sino que*.

TABLE 7

	GRAMMATICALITY JUDGEMENT TASK					
	ADVANCED			INTERMEDIATE		
	GR/GR	UNG/UNG	ING> GR	GR/GR	UNG/UNG	UNG>GR
PERO	02.61	52.81	44.2	78.81	49.03%	39.41
SINO	84.61	53.8%	45.11	16.91	46.1%	35.5%

Table 7. Description of each group's correct performance for *pero* and *sino* in the
grammaticality judgement task.

TMLZ 8

	GRAMMATICALITY, JUDGEMENT TASK					
	ADVANCED			INTERMEDIATE		
	GR/GR	UNG/UNG	UNG>GR	GR/GR	UNG/UNG	UNG>GR
PERO	93.2%	95.11	81.71	96.11	89.41	12.81
EXCEPTO	95.1%	72.1%	55.7%	95.1%	64.4%	51.9%

Table 8. Description of each group's correct performance for *pero* and *excepto* in the
grammaticallity judgement task.

TMLZ 9

	NATIVE SPEAKERS					
	GRAMMATICALITY JUDGEMENT TEST					
	GR/GR	GR/UNG	?	UNG/UN	UNG>GR	UNG/G	?
PERO	100%			100%	95%		
SINO	100%			97.5%	96%	2.5%	
EXCEP	97.5%	2.5%		100%	92.5%		
SINO	97.5%	2.5%		97.5%	90%	2.5%	
SINOQ	100%			100%	90%		
PERO	100%			100%	92.5%		
EXCEP	100%			100%	90%		
PERO	100%			100%	90%		
SINO	100%			1008	87.58		

Table 9. General description of ch. native speakers'
correct and incorrect performance for each form
across the three versions of ch. GJT.

TABLE 10

	NATIVE SPEAKERS					
	GJT					OT
	PERO	SINO	EXCEP	BUT = PERO	BUT = SINO	BUT = EXCEP
PERO	100%	97.5%	95%	100%	0%	0%
SINO	87.5%	90%	90%	0%	95%	5%
EXCEPTO	95%	95%	97.5%	0%	5%	95%

Table 10. Description of the native speakers' performance
for *pero*, *sino* and *excepto* in the correction and
translation tasks.