THE PEDAGOGIC EFFECTIVENESS OF DEVELOPMENTAL READINESS IN ESL GRAMMAR INSTRUCTION

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ABSTRACT

The project reported in this paper aims to test the concept of 'learner developmental readiness' and its pedagogic effectiveness in the teaching of foreign language grammar. It focuses on the teaching of English as a second language (ESL) in a formal classroom context. The aim is to ascertain whether a specific teaching order based on the concept of developmental readiness, can enhance learning outcomes in foreign language classrooms. The main theoretical approach used is the Teachability Hypothesis articulated in Pienemann's (1998) Processability Theory (PT), which "predicts that stages of acquisition cannot be skipped through formal instruction and that instruction will be beneficial if it focuses on structures from 'the next stage'" (Pienemann, 1998, p.13). Past teachability studies (e.g. Boss, 1996; Dyson, 1996; Ellis, 1989; Pienemann, 1984; Spada & Lightbown, 1999) have employed predicted order testing. However in this study subjects were exposed to English syntax structures either in the predicted or in the reversed orders outlined under PT. The findings of this study show that learners exposed to instruction in accordance with the developmental order predicted in PT produce the target language (TL) structures with a higher grammatical accuracy than those exposed to the reversed order. This suggests that instruction is more beneficial, in relation to grammatical accuracy, when it focuses on the TL structures in a developmentally implicational manner.

INTRODUCTION

This study tests the pedagogic effectiveness of the concept of 'learner developmental readiness' in the context of English as a second language. The paper will focus specifically on the teaching of English word order rules to beginners in a formal classroom context. A key aim of this project is to ascertain whether specific teaching intervention strategies based on the concept of 'developmental readiness' could enhance learning outcomes in foreign language classrooms. Also under examination is the feasibility of implementing the hierarchy of acquisition stages for ESL already established in the literature (Pienemann, 1998) as a basis for determining developmental readiness in foreign language classrooms. The broad theoretical approach used is Processability Theory (PT) (Pienemann, 1998), which views language acquisition as a gradual and cumulative developmental

process involving the automation of information exchange procedures, as a principal mechanism that drives learning through the hierarchy of acquisition stages. More specifically, this paper will employ a subset of PT, namely, the Teachability Hypothesis, which reflects the core theoretical premise of PT by asserting that 'stages cannot be skipped through formal intervention, because each stage requires processing procedures which are developed at the previous stage' (Pienemann, 1998, p.13). The paper, therefore, will seek to determine the extent to which learning may be shaped by specific sequencing of grammatical structures in the second language curriculum.

THEORETICAL BACKGROUND

This study coincides with a gradual shift in language education towards employing second language acquisition research as a relevant knowledge source for teaching practice and curriculum design (Lightbown, 1985, 2000; Long & Robinson, 1998). This is clearly evident in the growing number of empirical studies that attempt to test the educational benefits of specific design features in the curriculum, or certain teaching strategies inspired by and based on theoretical claims articulated within second language acquisition research (Doughty & Williams, 1998; Macroy, 2000; Mitchell, 2000). There is also a growing relationship between theoretical research in the field of second language acquisition and other relevant areas of academic inquiry, such as applied linguistics and foreign language assessment (cf Kramsch, 2000; Lightbown 1985; 2000; Long & Robinson, 1998).

In this context, Pienemann (1995, p.3), within his Teachability Hypothesis, poses the question: "why is it important for language teachers to know about acquisition stages?". The answer to this question in Pienemann's view is straightforward and precise: acquisition stages provide specific information on what learners can and cannot learn at different points in time. In other words, acquisition stages enable teachers to determine the developmental readiness of individual learners to learn specific structures of the TL. This paper will go beyond traditional error analysis of the learner language, to argue for a new approach to language teaching that reflects the developmental reference points provided by second language acquisition stages. This is especially relevant given that there is little disagreement in second language acquisition literature (cf Ellis, 1994; Kempen & Hoenkamp, 1987; Pienemann, 1998) that second language learners follow a predictable developmental sequence. A number of studies have been undertaken to test the concept of a universal developmental order in second language acquisition. In the context of the PT, for example, Table 1 provides a brief overview of a number of studies that have tested PT's Teachability Hypothesis in second and foreign language classrooms.

Study	TL	Learners' L1	Design	Findings
Pienemann (1984)	German	Italian	Pre-test, Post-test control group design: whether stage skipping is possible	Stage skipping shown to be not possible
Boss (1996)	German	English/ Chinese	Oral language production compared to taught syllabus as opposed to PT sequence	Learners progressed in the predicted order regardless of the taught syllabus
Ellis (1989)	German	English	Pre-test, Post-test control group design: formal versus naturalistic instruction	Support for Teachability Hypothesis
Spada and Lightbown (1999)	ESL	French	Pre-test, Post-test control group design: whether stage skipping is possible	Inconclusive (no support for Teachability Hypothesis): variation, L1 etc...
Dyson (1996)	ESL	Spanish	Longitudinal study to test Teachability Hypothesis as a predictor of teachable form	Overall support for Teachability Hypothesis despite inter-learner variation

Table 1: A brief overview of Teachability Hypothesis studies

As can be gleaned from the brief summary of the findings, there is experimental evidence to support the implicational nature of language learning and its psycholinguistic basis. However, what marks the difference between these studies and the research reported in this paper is the research design for the experiment and its slightly different focus. In fact, none of the studies listed in Table 1 tested the effect of grammar instruction by way of reversing the developmental sequence predicted in PT. Such a design would allow us to determine whether instruction, irrespective of sequencing, always results in learning. It would also shed light on the issue of long-term learnability of structures when developmentally moderated input is provided (in accordance with PT sequencing) and when it is not (in violation of PT sequencing).

APPROACH AND METHOD

In this section a discussion of key concepts and methods will be briefly outlined. The overall theoretical concept of learner developmental readiness is based on the idea of implicational acquisition stages as outlined in PT. PT's claim that languages

are essentially acquired in an incremental manner has been growing in acceptance in second language acquisition literature (Ellis, 1994; Kempen & Hoekamp, 1987; Levelt, 1989). What remains in contention in SLA literature though, are the tools and mechanisms that learners need to develop grammatical structures in the TL. According to Pienemann the incremental nature of language learning requires a number of key processing resources that are accumulated in an essentially implicational manner. The claim that there is an implicational hierarchy of developmental stages has indeed been supported by a number of empirical investigations: e.g. Mansouri (1999, 2000); Salameh, Håkansson & Nettelbladt (1996); Johnston (1995); and Pienemann (1998), on the acquisition of Arabic, Swedish, English and German respectively. The following is a brief sketch of developmental readiness as operationalised in this study.

Learner developmental readiness

The concept of learner developmental readiness is closely linked to that of acquisition stages. A learner is developmentally ready to learn a specific language structure X when he/she has access to all those linguistic and procedural skills required to produce structure X. Developmental readiness, as defined in this study, assumes that learning is cumulative and implicational by nature and that learners acquire the structures of the TL in a step-like manner with less complex structures forming the prerequisite for the more complex ones. In other words, the sequencing of the structures must reflect their exact linguistic and processing complexity for learning to be successful. In the process of acquiring a second language, learners acquire the rules of the TL in a fixed order and, therefore, go through a predictable order of developmental stages. A developmental stage may include one or more morpho-syntactic structures that learners can use productively at a certain point in time. What is important as far as acquisition criteria are concerned is the learner's ability to produce the given structure in lexically and morphologically different contexts.

Research hypotheses and predictions

The main hypotheses to be tested are as follows:

- The effectiveness of grammar instruction is affected by the sequencing of grammar rules and the careful assessment of the learner developmental readiness;
- Formal instruction can be most effective if it focuses on structures for which learners exhibit developmental readiness.

In order to test these hypotheses we need to establish a hierarchy of stages for the acquisition of ESL, which allows us to identify the developmental status of learners at the pre-testing stage, during the course of the study, and at the post-testing final phase. The acquisition stages for English as a second language

outlined below are concerned with syntactic structures only. They represent a developmental hierarchy that was a fundamental methodological tool in this project as it was used to identify the learners' developmental status (i.e. their stage on the hierarchy) and therefore their readiness to benefit from specific sequencing of grammatical structures. Rather than representing a comprehensive display of the acquisition stages, Table 2 displays a number of key syntactic structures in English interlanguage (cf Pienemann, 1998, p.171).

Stage	**Processing Procedures**	**Syntax – Word Order**
Stage 1	Lemma (no sequence of constituents)	Invariant Forms
Stage 2	Category procedure (no exchange of information)	Canonical Order (Subject Verb Object)
Stage 3	*Phrasal* procedure (exchange of information within constituent)	Do Fronting
Stage 4	Simplified sentence procedure: word order rules + saliency (exchange of information from internal to salient constituents)	Inversion in Yes/No Questions
Stage 5	Sentence procedure: word order rules – saliency: (exchange of information between internal constituents)	Auxiliary 2nd
Stage 6	Subordinate clause procedure	Cancel Inversion

Table 2: Processing procedures of English

The above representation for the acquisition of English syntax is data-driven in that it is based on the actual speech produced by learners. The borders between the various acquisition stages reflect a combination of the formal linguistic properties of the structures and the processing requirements for their production. Subjects were tested using Stages 1 to 6, however, emphasis was placed on the analysis of Stages 2 to 6.

Research design

This project employed an essentially pre-test, post-test experimental design using two groups of learners in an English for Academic Purposes (EAP) 1 Pre-Intermediate course. All students were exposed to the same English teaching curricula and teaching staff and received additional tuition outside college hours once a week from one of the researchers. However treatment in these post-school

sessions varied resulting in developmental readiness being varied, as shown in Table 3. Half the students were taught ESL syntactic structures in the predicted order hierarchy of Stages 2-6, the order they were developmentally ready for, while the remainder received the same lessons but in reversed order (6-2).

Variable	Predicted Order Group (2-6)	Reversed Order Group (6-2)
Developmental Readiness (Processability Theory hierarchy for ESL syntax)	+ Developmental Readiness (based on PT hierarchy for ESL)	- Developmental Readiness (based on PT hierarchy for ESL)

Table 3: Research design

The learners

The learners in this project were adult English students studying full-time. Although 12 subjects began the study, only 6 completed all sessions (n=6). As participation was entirely voluntary and held outside class hours, subject attrition was unavoidable. Three men and three women fulfilled all the study's research and testing requirements. Their biographical details are listed in Table 4.

The students were undertaking academic English programs of 10 to 40 weeks duration, with the majority intending to complete 25 weeks of instruction. All subjects were studying English so that they could further their academic studies either in Australia or in their home country. All but the 26-year-old male subject intended to complete pre-tertiary studies in Australia, in business or mass communications, once they had satisfactorily completed their English studies. Most then hoped to use these studies to gain entry into degree courses in Australian institutions, either at bachelor or master levels.

	Sex	Age	Country of Origin
Predicted Order 2-6 Group			
Subject A	Female	20	Hong Kong
Subject B	Male	24	Thailand
Subject C	Male	23	Thailand
Reversed Order 6-2 Group			
Subject X	Female	17	Hong Kong
Subject Y	Male	26	Korea
Subject Z	Female	18	Indonesia

Table 4: Biographical details of participants

Selection of participants

Participants were EAP Level 1 students at an English college in Melbourne. Students enrolled at this level were essentially beginners and hence represented a credible group for testing the project's hypotheses. Before testing took place permission was sought both from the college and the prospective participants. It was stressed to the students that participation in the project was voluntary, would take place outside teaching hours and would not have an impact on their EAP studies. Those students who agreed to participate in the research were then tested to determine their English levels.

Pre-testing, through oral interviews and examination of written entrance essays and tests, placed the students along the ESL acquisition stages outlined in Table 2, confirming their suitability for the study. According to PT's Teachability Hypothesis they were developmentally ready to acquire Stages 4, 5 and 6 in that implicational order. The students were already able to produce structures from Stage 1 (Invariant Forms), Stage 2 (Canonical Order) and Stage 3 (Do Fronting).

Classroom input

The EAP 1 class did not use a prescribed textbook. Instead teachers received a recommended resource list for use with each class level. Exercises from the textbooks were used periodically within the classroom. The students received formal instruction from several qualified teachers, who were native English speakers, from 9am until 3.30pm Monday to Friday. Around 80% of teaching time was spent on integrated consolidation of skills (reading, writing, listening, speaking, grammar and vocabulary) and the remaining 20% on specific academic skills such as writing essays, research and note-taking. Apart from this formal teaching, students had interaction with one of the researchers, a native English speaker, on a weekly basis for around one hour. Most students lived with English-speaking host families but used their first language with friends at school.

Data collection schedule

Data was collected systematically from the two groups of learners (Predicted and Reversed Order) on a weekly basis over six weeks with a final test one month later, as outlined in Table 5 below. The students self-selected themselves into the Predicted or Reversed Order Group, on the basis of their ability to attend either Tuesday or Thursday sessions. The Predicted Order Group, whose sessions were held on Tuesdays, was exposed to the TL structures in the developmental order predicted by PT, i.e. Stages 2 to 6. In contrast, the Reversed Order Group, whose sessions were held on Thursdays, was exposed to the TL structures in the reverse developmental order as predicted by PT, i.e. Stages 6 to 2. Subjects A, B and C formed the Predicted Order Group and Subjects X, Y and Z the Reversed Order Group.

	Predicted Order Group (2-6)		Reversed Order Group (6-2)	
	Test Stage	**Date**	**Test Stage**	**Date**
Week 1	Pre-test (Time 1)	26 July	Pre-test (Time 1)	26 July
Week 2	Stages 2/3 (T2)	31 July	Stage 6 (T2)	2 August
Week 3	Stage 4 (T2)	7 August	Stage 5 (T2)	9 August
Week 4	Stage 5 (T2)	14 August	Stage 4 (T2)	16 August
Week 5	Stage 6 (T2)	21 August	Stages 2/3 (T2)	23 August
Week 6	Post-test (T3)	24 August	Post-test (T3)	24 August
1 Month Later	Final test (T4)	3 October	Final test (T4)	3 October

Table 5: Data collection schedule

The chronological timeline (T) for the study as represented in Table 5 refers to the following data collection sessions: Time (1) Pre-testing; Time (2) Interim testing; Time (3) Final/Post-Testing; Time (4) Delayed Testing.

Data elicitation procedures

The researchers were interested in gathering both oral and written language production of the relevant PT stages. Emphasis was placed firstly on the subjects' production of form, and secondly on grammatical accuracy, in lexically and morphologically different contexts. Therefore, the main data-eliciting procedures used during the classes were oral interviews, semi-structured conversations and short written tasks with specifically designed sets of stimuli that created linguistic and functional contexts for the tested structures. The researchers formulated stimuli appropriate to each stage and modelled on examples from the elementary grammatical teaching guides listed above. Students were given handouts of pictures representing typical topics of elementary conversation such as pets, family, hobbies, studies and weather. In order to gain a full picture of the progress of both groups, all sessions were audio-taped, as were the oral interviews. At the conclusion of each session, to test short-term learnability subjects were given a brief written test, which covered the language aspects under consideration.

Once procedures were in place the project commenced with a pre-test of all participating students (T1). This took the form of a five part written test

which covered Stages 2 to 6 of PT and a conversational interview with one of the researchers, in which subjects were asked biographical questions, again in a form which would elicit syntactical stages of PT. Students who were both available and at a suitable level for the study, then chose either the Tuesday (Predicted Order) or Thursday (Reversed Order) group to attend.

Both the Predicted and Reversed Order Groups followed the same research procedures, with the same researcher using the same materials. Each week the researcher spent approximately 50 minutes to one hour with both groups presenting structures from a specific developmental stage. The experimental teaching strategies involved presenting the students with input rich in the target structure both orally and in a written form often using the whiteboard. Multiple versions of the target structures were always presented ensuring both lexical and morphological variation. The students were then prompted to produce their own examples, with the researcher providing (positive) feedback as necessary. They were then given additional stimuli in the form of printed handouts with simple drawings and topic labels and asked to use these for conversations with fellow students. Where needed, students received additional instructions from the researcher. Once all subjects were able to produce examples representative of the stage of PT being assessed, the examples were removed from the board.

The next stage involved a brief written test of 5-10 minutes (T2). These interim tests were modifications of the relevant PT stage of the pre-test and were formulated to test short-term learnability. Once the written testing was concluded, students undertook an oral test. Each student was given the opportunity to both ask and answer questions and this section of the session usually took between 10 and 15 minutes. If it appeared that students had exhausted the handout format, the researcher asked questions to restart the conversations.

A week after the final class, subjects were asked to complete a post-test (T3), which was similar in structure and design to the pre-test. Just over a month later we sought to establish long-term learnability by having participants complete oral and written delayed post-tests covering all PT stages. The final oral test consisted of an interview during which each student was asked to formulate questions, make statements and provide comments on drawings and pictures used during their classes. The final written test was a modification of previous written tests. While students may have had some familiarity with the layout and structure of tests, modifications of questions and delayed testing reduced the possibility of 'practice' results.

DATA ANALYSIS

At the end of each testing period, both oral and written data were collected from the participants in the study. This data was first transcribed, grouped according to Structure Stage and then collated separately as either Predicted or Reversed Order subject data. As this paper focuses on the effectiveness of specific developmental

sequences in grammar instruction, discussion of the mere suppliance of structures will be brief. Suffice to note here that overall form suppliance results for both the Predicted Order 2-6 and the Reversed Order 6-2 groups across all time periods were relatively high, in particular in written forms. This may in some part be attributable to the learners' subsequent familiarity with the tests and an increased recognition of form patterns. For instance, although S6 Cancel Inversion is predicted to emerge last along the developmental hierarchy, both groups were in most instances able to supply this structure often relying on formulaic syntactic patterns. For example, Subject A (Predicted 2-6) used the strategy:

"I wonder why" + (definite/indefinite article) + noun + verb + object

This is illustrated in the learner's pre-test answers which included:

I wonder why the chocolate is trick;
I wonder why the sun wearing the sunglasses;
I wonder why the shark eating small fish.

As far as the S5 Auxiliary 2nd structure is concerned, learners from both groups were unable to consistently produce the structure in the correct syntactic form. For example, Subject X's (Reversed 6-2) pre-test data included:

Why Cathy wasn't at work today?

In the example above, the learner does not produce the structure S5 Auxiliary 2nd because the key feature (Aux. 2nd) is not present in the example. After the intervention of S5 teaching, Subject X's interlanguage usually included the required structure in the immediate testing. However, by the time of the delayed post-test it was clear that this structure was still not acquired, as demonstrated by the lack of application of the inversion rule in this extracted test question:

Why the class was cancelled?

This apparent regression in the production of this structure highlights the importance of delayed learnability testing in the context of language teaching in general and grammar instruction in particular.

GRAMMATICAL ACCURACY FINDINGS AND DISCUSSION

It should be stated from the outset that although each group ultimately consisted of only three learners, each individual learner had to produce all structures numerous times, across multiple time periods in a minimum of five obligatory linguistic contexts. In other words, while the study size was small in terms of number of par-

ticipants, the actual size of data collected was considerable and averaged 30 instances of production for each structure per participant. This gives us around 180 tokens per structure across the six learners, which is a substantial amount of data for testing specific developmental sequences in ESL syntax. Tables 6 and 7 show grammatical accuracy results in ratios for all PT structures.

Structure	***Subject***	***Time 1:*** ***Pre-test***	***Time 2:*** *Subsequent to T1 sessions (short term effects)*		***Time 3:*** *Post-test*	***Time 4:*** *Delayed Post-test (long term learnability)*	
		Written	Oral	Written	Written	Oral	Written
S2 Canonical Order	*A*	*2/4 (0.5)*	*4/4 (1.0)*	*2/2 (1.0)*	*4/4 (1.0)*	*5/5 (1.0)*	*N/T*
	B	*2/4 (0.5)*	*4/4 (1.0)*	*2/2 (1.0)*	*4/4 (1.0)*	*5/5 (1.0)*	*N/T*
	C	*4/4 (1.0)*	*4/4 (1.0)*	*2/2 (1.0)*	*4/4 (1.0)*	*5/5 (1.0)*	*N/T*
		0.67	***1.0***	***1.0***	***1.0***	***1.0***	***N/T***
S3 Do Fronting	*A*	*0/5 (0.0)*	*10/10 (1.0)*	*3/3 (1.0)*	*5/5 (1.0)*	*3/4 (0.75)*	*4/4 (1.0)*
	B	*3/5 (0.6)*	*7/7 (1.0)*	*3/3 (1.0)*	*5/5 (1.0)*	*3/3 (1.0)*	*5/5 (1.0)*
	C	*5/5 (1.0)*	*4/4 (1.0)*	*3/3 (1.0)*	*5/5 (1.0)*	*4/4 (1.0)*	*5/5 (1.0)*
		0.53	***1.0***	***1.0***	***1.0***	***0.92***	***1.0***
S4 Inversion Yes/No	*A*	*4/8 (0.5)*	*7/7 (1.0)*	*8/8 (1.0)*	*8/8 (1.0)*	*1/11 (0.09)*	*4/5 (0.8)*
	B	*7/8 (0.88)*	*9/9 (1.0)*	*8/8 (1.0)*	*8/8 (1.0)*	*8/8 (1.0)*	*3/5 (0.6)*
	C	*8/8 (1.0)*	*9/9 (1.0)*	*8/8 (1.0)*	*8/8 (1.0)*	*3/9 (0.33)*	*5/5 (1.0)*
		0.79	***1.0***	***1.0***	***1.0***	***0.47***	***0.8***
S5 Auxiliary 2nd	*A*	*2/8 (0.25)*	*4/11 (0.36)*	*10/10 (1.0)*	*5/10 (0.5)*	*4/5 (0.8)*	*3/5 (0.6)*
	B	*0/4 N/S*	*2/8 (0.25)*	*10/10 (1.0)*	*10/10 (1.0)*	*6/14 (0.43)*	*4/5 (0.8)*
	C	*4/10 (0.4)*	*6/7 (0.86)*	*8/10 (0.8)*	*7/10 (0.7)*	*5/6 (0.83)*	*4/5 (0.8)*
		0.33	***0.49***	***0.93***	***0.73***	***0.69***	***0.73***
S6 Cancel Inversion	*A*	*1/5 (0.2)*	*5/8 (0.63)*	*5/5 (1.0)*	*5/5 (1.0)*	*7/9 (0.78)*	*5/5 (1.0)*
	B	*0/5 (0.0)*	*4/5 (0.8)*	*4/5 (0.8)*	*4/5 (0.8)*	*7/8 (0.88)*	*5/5 (1.0)*
	C	*5/5 (1.0)*	*3/4 (0.75)*	*5/5 (1.0)*	*5/5 (1.0)*	*6/6 (1.0)*	*5/5 (1.0)*
		0.4	***0.73***	***0.93***	***0.93***	***0.89***	***1.0***

N/S - non-suppliance – no answer given
N/T – not tested

Table 6: Grammatical accuracy - Predicted Order Group 2-6 data results and ratios

Structure	Subject	Time1: Pre-test	Time 2: Subsequent to T1 sessions (short term effects)		Time 3: Post-test	Time 4: Delayed Post-test (long term learnability)	
		Written	**Oral**	**Written**	**Written**	**Oral**	**Written**
S2	*X*	*2/4 (0.5)*	*4/4 (1.0)*	*2/2 (1.0)*	*4/4 (1.0)*	*5/5 (1.0)*	*N/T*
Canonical	*Y*	*2/4 (0.5)*	*5/5 (1.0)*	*2/2 (1.0)*	*4/4 (1.0)*	*4/5 (0.8)*	*N/T*
Order	*Z*	*3/4 (0.75)*	*4/4 (1.0)*	*2/2 (1.0)*	*3/4 (0.75)*	*NT*	*N/T*
		0.58	***1.0***	***1.0***	***0.92***	***0.9***	***N/T***
S3	*X*	*3/5 (0.6)*	*4/5 (0.8)*	*2/3 (0.67)*	*2/5 (0.4)*	*3/4 (0.75)*	*5/5 (1.0)*
Do	*Y*	*3/5 (0.6)*	*4/4 (1.0)*	*3/3 (1.0)*	*5/5 (1.0)*	*3/4 (0.75)*	*4/5 (0.8)*
Fronting	*Z*	*4/5 (0.8)*	*4/8 (0.5)*	*1/3 (0.33)*	*3/5 (0.6)*	*3/5 (0.6)*	*4/5 (0.8)*
		0.67	***0.77***	***0.67***	***0.67***	***0.7***	***0.87***
S4	*X*	*8/8 (1.0)*	*8/9 (0.89)*	*6/8 (0.75)*	*7/8 (0.88)*	*7/9 (0.78)*	*3/5 (0.6)*
Inversion	*Y*	*6/8 (0.75)*	*14/14 (1.0)*	*8/8 (1.0)*	*8/8 (1.0)*	*7/8 (0.88)*	*5/5 (1.0)*
Yes/No	*Z*	*7/8 (0.88)*	*9/10 (0.9)*	*8/8 (1.0)*	*8/8 (1.0)*	*10/16 (0.63)*	*5/5 (1.0)*
		0.88	***0.93***	***0.92***	***0.96***	***0.76***	***0.87***
S5	*X*	*7/10 (0.7)*	*14/15 (0.93)*	*6/10 (0.6)*	*8/10 (0.8)*	*5/7 (0.71)*	*4/5 (0.8)*
Auxiliary	*Y*	*7/10 (0.7)*	*10/12 (0.83)*	*5 I/I & 5/5 (1.0)*	*9/10 (0.9)*	*2/6 (0.33)*	*5/5 (1.0)*
2nd	*Z*	*7/10 (0.7)*	*7/11 (0.64)*	*6/10 (0.6)*	*4/10 (0.4)*	*12/17 (0.71)*	*3/5 (0.6)*
		0.7	***0.8***	***0.73***	***0.7***	***0.58***	***0.8***
S6	*X*	*0/5 (0.0)*	*1/6 (0.17)*	*2/5 (0.4)*	*3/5 (0.6)*	*1/6 (0.17)*	*1/5 (0.2)*
Cancel	*Y*	*3/5 (0.6)*	*4/4 (1.0)*	*3/5 (0.6)*	*2/5 (0.4)*	*3/7 (0.43)*	*4/5 (0.8)*
Inversion	*Z*	*0/5 (0.0)*	*4/5 (0.8)*	*3/5 (0.6)*	*1/5 (0.2)*	*3/13 (0.23)*	*2/5 (0.4)*
		0.2	***0.66***	***0.53***	***0.4***	***0.28***	***0.47***

Table 7: Grammatical accuracy - Reversed Order Group 6-2 data results and ratios

Ratios were calculated by dividing the number of grammatically accurate structures by the total number of tested structures. For example, in the pre-test for Stage 3 Do Fronting, the Predicted Order Group 2-6 had an overall ratio of 0.53. Subject A produced no grammatically correct forms in the 5 tested, Subject B managed 3 correct and Subject C produced 5, hence the overall score was 8 tokens out of 15

obligatory contexts. This aggregate score gives us the overall ratio of 0.53 for the structure in question.

Overall, the statistical findings suggest that there was a noticeable disparity in results between oral and written tests. Learners in both groups were able to produce grammatically accurate forms in written tests more frequently than in oral ones, critically when using structures from S5 (Auxiliary 2nd) and S6 (Cancel Inversion). At times the difference between oral and written data was considerable, most notably in the results of the Reversed Order Group across S5 and S6 testing. These learners were able to produce S5 structures with grammatical accuracy in 4 out of 5 contexts (a ratio of 0.8), but this dropped to 3 out of 5 (a ratio of 0.6) in the oral test. Likewise, the Reversed Order Group S6 ratio result in written testing was 0.47 but only 0.28 when participants had to produce this structure orally. The following examples highlight the difference between oral and written production for S5 and S6 structures.

S6 Cancel Inversion Spoken vs Written

Predicted Order 2-6

I wonder why the snowman has a long nose. (Subject A: Time 4: Written)

She asked her mother why the door was opened. (A:T4: Written)

He wants to know why lion is animals? (A:T4: Spoken)

I wonder why some people wear the glass when the summer is coming? (A: T4: Spoken)

Reversed Order 6-2

My parents wanted to know why I loved her. (Y:T4:Written)

I asked the teacher when her birthday was. (Y:T4:Written)

He wanted to know why you don't like to make your girlfriend in Australia. (Y:T4:Spoken)

The boss wanted to know whether he has a holiday in his company. (Y:T4: Spoken)

S5 Auxiliary 2nd Spoken vs Written

Predicted Order 2-6

Why was the class cancelled? (Subject B: Time 4: Written)

What is the teacher's name? (B:T4:Written)

When er when er when do you call to your girlfriend? (B:T4: Spoken)

Where where have you ever been to visit another country? (B:T4: Spoken)

Reversed Order 6-2

When did Lily arrive in Australia? (Z:T4:Written)

Where are the new students from? (Z:T4:Written)

What is favourite movie do you like? (Z:T4:Spoken)

What is your mother's hobbies? (Z:T4:Spoken)

In general, Predicted and Reversed Order learners' data exhibit similar patterns of production in relation to lower level structures, which suggests that specific ordering of formal instruction (Stages 2-6 or 6-2) is less important than the PT-generated developmental readiness. The lower level results are also a reflection of subjects' abilities at the commencement of the project to produce, not always grammatically accurately, Stages 1-3. It should also be noted that the Reversed Order Group performed slightly better across Stages 3-5 in the pre-test. In other words, they handled Do Fronting, Inversion in Yes/No Questions and Auxiliary 2nd with more grammatical accuracy from the outset, thus having less margin for improvement than the Predicted Order Group.

The picture, however, is more complex when it comes to the production of higher level structures, in particular S6 Cancel Inversion, where the nature of structures ordering does seem to affect learners' L2 production. This is evident when comparing both groups' starting points for grammatical accuracy of S6. In this stage the Reversed Order Group has much more margin for improvement than the Predicted Order Group, beginning with a score of 0.2 compared with 0.4. However, the delayed post-testing shows that the Reversed Order participants managed a 27% improvement, compared with the Predicted Order Group's 60%. Testing across time periods and using the same materials, instructor and tests, reduced external influencing factors such as recency of teaching and familiarity with testing methods. That such a difference emerged requires explicit analysis and examination of the effect of procedural ordering of this syntactically complex stage.

A comparative analysis of the learners' production of Cancel Inversion

The low ratios in Table 8 below provides quantitative evidence of the learners' difficulty in producing complex structures such as S6 Cancel Inversion. This is especially the case for the Reversed Order Group whose collective ratio is clearly lower than the Predicted Order Group. The following examples, taken from written test data of S6, illustrate the linguistic features of the learners' language in the context of Cancel Inversion.

Predicted Order 2-6

I wonder why the shark eating small fish. (Subject A: Time 1)

I asked the teacher when box day is come. (A:T4)

I wonder why do you have eh often summer. (B:T1)

I wonder why how to make chocolates. (B:T2)
I wonder why the shark eat fish. (C:T2)
I wonder why the winter is come very fast this year. (C:T4)

Reversed Order 6-2

I wonder why the chocolate will broken up. (X:T2)
I wonder why the snowman like a human. (X:T4)
I wonder why you hates the chocolate. (Y:T2)
I wonder why I like a sun. (Y:T3)
I wonder why he likes watch magician. (Z:T1)
I wonder why they forgive. (Z:T4)

	Time 1: *Pre-test*	***Time 2:*** *Subsequent to T1 sessions (short term effects)*		***Time 3*** *Post-test*	***Time 4:*** *Delayed Post-test (long term learnability)*	
Predicted Order 2-6	Written	Oral	Written	Written	Oral	Written
Subject A	*0.2*	*0.63*	*1.0*	*1.0*	*0.78*	*1.0*
Subject B	*0.0*	*0.8*	*0.8*	*0.8*	*0.88*	*1.0*
Subject C	*1.0*	*0.75*	*1.0*	*1.0*	*1.0*	*1.0*
	1.2/3 = ***0.4***	*2.18/3 =* ***0.73***	*2.8/3 =* ***0.93***	*2.8/3 =* ***0.93***	*2.66/3 =* ***0.89***	*3/3 =* ***1.0***
Reversed Order 6-2						
Subject X	*0.0*	*0.17*	*0.4*	*0.6*	*0.17*	*0.2*
Subject Y	*0.6*	*1.0*	*0.6*	*0.4*	*0.43*	*0.8*
Subject Z	*0.0*	*0.8*	*0.6*	*0.2*	*0.23*	*0.4*
	0.6/3 = ***0.2***	*1.97/3 =* ***0.66***	*1.6/3 =* ***0.53***	*1.2/3 =* ***0.4***	*0.83/3 =* ***0.28***	*1.4/3 =* ***0.47***

Table 8: Group ratios for Stage 6 (Cancel Inversion)

Table 8 shows that not only do learners in the Predicted Order Group improve their production accuracy rate in both oral and written data, but also that they are able to maintain these 'acquisitions' in the delayed post-testing session. In contrast,

the Reversed Order learners were not able to maintain their improvements and, by the time of the delayed post-testing session, their production had in fact regressed in particular with regard to oral data, as shown in the following statistical summary:

	Oral: Time 2	Oral: Delayed Post-test
• Predicted Order Group	▶ 0.73	▶ 0.89
• Reversed Order Group	▶ 0.66	▶ 0.28

Figure 1: Overall statistical summary of key findings for S6 (Cancel Inversion)

In general, the results show that grammatical accuracy was overall higher and better sustained among learners who were exposed to teaching in line with PT predictions (Predicted Order). Although the Reversed Order Group were able to initially produce complex syntactic structures (e.g. S6 Cancel Inversion) despite the reversed developmental order, there are clear quantitative indicators that suggest grammatical accuracy results are less well maintained in this group of learners than in those exposed to the developmentally predicted order. This implies a relationship between PT stage ordering and long-term learnability as illustrated in Figure 2 below:

	T1	T2	T3	T4	
• Predicted Order Group	**0.4**	→ 0.93	→ 0.93	→**1.0**	Results sustained and improved upon
• Reversed Order Group	**0.2**	→ 0.53	→ 0.4	→ **0.47**	Results regress across time

Figure 2: Long-term learnability for S6 in written data

CONCLUSION

Second language acquisition research is concerned with the way in which learner language develops. It views learning from the learner's own perspective (the learner's own reconstruction of the TL) and attempts, therefore, to establish a clear reference point for what learners can do and what they cannot do. This study is an attempt to show that this reference point can then be used to determine the extent to which certain structures are teachable in second language classrooms

and the importance of specific ordering of grammar instruction. More specifically, this study tested the effectiveness of developmental readiness in second language teaching, and whether the predicted hierarchy of acquisition stages for ESL can enhance learning of grammar.

Two methodological issues affected the implementation of this study: the first relates to student numbers and the second to the relatively high level of proficiency in ESL of most participants. This meant that the most significant aspect of this experimental study related to the acquisition of Cancel Inversion (a Stage 6 structure). The relative familiarity of the learners in both groups with many of the English syntactic structures (in particular those listed in Stages 2, 3, and 4) meant, however, that grammatical accuracy would then be a more meaningful test for the effectiveness of specific developmental sequences in grammar instruction. Still, the study's findings show that learners in the PT predicted developmental order perform better than those in the Reversed Order Group both in oral and written tasks. In fact, as shown in Figures 1 and 2 above, when learners are taught the TL grammar in the PT order, not only does the overall rate of grammatical accuracy improve but, more importantly, the long-term learnability of the structures is also enhanced.

It is worth noting here that, except for S6, the Reversed Order Group outperformed the Predicted Order Group in the Pre-test and, consequently, exhibited smaller learning gains at the delayed Post-test. One might argue that this smaller gain may be a result of the fact that the Reversed Order Group had less room for improvement. Yet in S6, where the Reversed Order Group did have more room for improvement, they made less overall improvement than the Predicted Order Group. This differential improvement in grammatical accuracy does lend further support to the Teachability Hypothesis as reflected in the predicted developmental sequence. The issue of short-term memory, however, remains a methodological challenge in this particular research design, as structures were presented to learners in both groups at different points in time, as displayed in Table 5. Therefore, the temporal gap between the teaching of S6 (Cancel Inversion), for example, and its production by learners during delayed post-testing was not identical in both groups: 10 weeks for Reversed Order Group and 7 weeks for the Predicted Order Group. Nevertheless, given that (a) the delayed post-testing took place more than 4 weeks after the final teaching intervention, and (b) the Predicted Order Group still did better on a difference score following immediate post-testing, it becomes quite clear that the order of sequencing is, in fact, a key factor in the learners' language production.

Overall, and despite its unique experimental design, the study's findings lend empirical support to the Teachability Hypothesis and its key notion of implicational developmental sequences. Foreign language learning does benefit from developmentally oriented instruction: the Predicted Order Group outperformed the Reversed Order Group in most measures (production and grammatical

accuracy in different tasks). Approached differently, the findings of this study suggest that input is not a guarantee for output/acquisition, as the notion that any L2 structure can be learned as long as it is taught intensively is not supported. This research confirms the psycholinguistic plausibility of the PT developmental sequence and highlights its potential for pedagogic implementation.

NOTES

1 This point was drawn to the attention of the authors by one of the anonymous reviewers. The authors gratefully acknowledge the constructive feedback they received through the review process. Needless to say, any shortcomings remain the sole responsibility of the authors.

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