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COGNITIVE PROCESSES AND THE P-P-P (PRESENTATION-PRACTICE-PRODUCTION MODEL) IN CONTEMPORARY ELT MATERIALS[1]

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ABSTRACT

This paper focuses on the two kinds of knowledge humans may attain (specifically, linguistic knowledge), the cognitive processes as described in psycholinguistics and neurolinguistics leading to knowledge attainment and their correspondence to the PPP (Presentation-Practice-Production model of activity sequencing). Even though method in general and specific pedagogical actions imply the development of a specific type of knowledge (declarative or procedural), and a specific activity sequencing in teaching materials and procedures, the application of cognitive studies to language teaching has not been granted much relevance throughout the history of foreign pedagogy.

The analysis of a case-study is undertaken in which a sample lesson from a well-known contemporary textbook is examined with the following aims in mind: (i) to ascertain up to what point its activities favour the attainment of declarative or procedural knowledge, and (ii) to detect whether the activity sequencing agrees or not with the PPP and thus with DEC->PRO cognitive sequencing. The analysis is performed on the activities of the units, since they constitute the operative pedagogical units both in textbooks and in the classroom.

Keywords: language teaching materials, PPP, activity sequencing, cognitive sequencing, declarative knowledge, procedural knowledge

RESUMEN

El presente trabajo se centra en los dos tipos de conocimiento lingüístico que los humanos pueden aprender, así como en los procesos cognitivos descritos en psicolingüística y neurolingüística que conducen a la obtención de conocimiento y su correspondencia con el PPP (modelo de secuenciación de actividades de Presentación-Práctica-Producción). A pesar de que los métodos en general y los procedimientos didácticos en particular implican el desarrollo de un tipo específico de conocimiento (declarativo o procedimental) y una determinada secuencia de actividades en los materiales docentes, apenas se ha concedido importancia alguna a la aplicación de estudios derivados de la psicología cognitiva en la historia de la enseñanza de idiomas.

El estudio de caso en este trabajo analiza una unidad modelo procedente de un libro contemporáneo para la enseñanza del inglés como lengua extranjera muy conocido a nivel nacional. Se persiguen los siguientes objetivos: (i) determinar hasta qué punto las actividades favorecen el aprendizaje de conocimiento declarativo o procedimental, y (ii) averiguar si la secuenciación de las actividades concuerda o no con el PPP y, por tanto, con la secuenciación cognitiva DEC->PRO. El análisis se efectuará sobre las actividades, pues éstas constituyen las unidades pedagógicas operativas en los manuales y en el aula.

Palabras clave: materiales para la enseñanza de lenguas extranjeras, secuenciación de actividades, secuenciación cognitiva, conocimiento declarativo, conocimiento procedimental

1. LANGUAGE TEACHING AND COGNITIVE PROCESSES

The analysis of language learning processes may be viewed from two perspectives: (i) the inner, built-in processes inside the brain of the learners or, in other words, the cognitive processes governed by the neural network that controls the brain; (ii) the cognitive processes induced or fostered by external factors, i.e., the processes triggered by the teaching action itself.

The importance of cognitive processes in knowledge acquisition in general and in language learning in particular is explicitly emphasised here. This issue has been absent in academic discussions and research until recently. The importance of cognitive processes has been pointed out in instructed SLA research (Ellis, 2006; Hulstijn, 2005; Schmidt, 1994; VanPatten, 2009; Van Patten and Cadierno, 1993, among others), and is one of the most salient issues today in

psycholinguistics, biolinguistics and neurolinguistics (Anderson, 2005; DeKeyser, 2007a, 2007b, 2007c; Jenkins, 2000; Paradis, 2009; Schmidt, 1990, 1994; Ullman, 2004, among others).

Even though methods in general and specific pedagogical actions imply a specific sequencing in teaching materials and procedures, this fact has not been granted much relevance throughout the history of language teaching; only recently the PPP (Presentation-Practice-Production model) has defined a sequencing pattern which was consolidated in the school system through the structurally based methods in the 60s and 70s. Psycholinguistics and neurolinguistics, for their part, have underlined the key role of cognitive processes and their sequencing in learning.

2. THE PPP MODEL

The three Ps stand for, in this order, Presentation-Practice-*Production,* or *P1-P2-P3*. These three phases derive from or are rooted in a very traditional teaching practice and experience: (i) explicit/direct presentation of the language (P1) that the teacher introduces so that the learner gains a clear and conscious understanding of it, or indirect/implicit presentation of items as contextualised in skill based activities whose main focus is skill work rather than the study of new structural or lexical items; (ii) practice with the previously introduced material (P2), emphasising specific patterns and grammar points, (since experience shows that practice is needed for the consolidation of new and previously presented knowledge), and (iii) production of similar patterns (P3) with some autonomous manipulation of the linguistic items features already learnt or partially consolidated through previous practice.

Criado-Sánchez (2008, in press) has illustrated the fact that, from the point of view of activity sequencing within each lesson, the PPP is present in most current ELT textbooks, although the authors claim that they are guided by communicative principles. If this is so, criticisms of the PPP seem to be rather inconvincing, since communicative teaching materials run parallel to the same 'reviled' pattern in materials organization. This issue deserves a more careful analysis and in this paper it is addressed from two perspectives around which most

criticisms have concentrated, which are closely linked to cognitive processes.

3. DECLARATIVE AND PROCEDURAL KNOWLEDGE FROM A NEUROPSYCHOLOGICAL PERSPECTIVE

Traditional and theoretical constructs and methods of second language learning[2] are not adequate to deal with the complexity of language learning and acquisition. Linguistics, for example, explains the structure of language, but has nothing to say on the physical basis of language acquisition and production. Pedagogy may contribute the strategies for teaching, but it does not add anything on the storing of new information in the neural network. Hence, any method that counts on an incomplete amount of intervening disciplines is inherently limited.

Psycholinguistics and neurolinguistics are supplying new key data on cognitive processes, the way they operate and the physical conditions and constraints they are submitted to. These new disciplines (Dörnyei, 2009) are crucial for understanding the nature of cognition, and specifically language acquisition and learning. As mentioned above, the PPP offers a distinct sequence in the presentation of teaching materials. Since the PPP may be defined as a model based on the 'school tradition', common sense and some principles born within the structurally-based methods, the question may be posed whether the cognitive processes triggered by the PPP match what we know of the cognitive processes as described in psycholinguistics and neurolinguistics.

One of the models of knowledge and skill acquisition has been presented by Anderson: Anderson's model of skill learning, that is, Adaptive Control of Thought (ACT) or its latest ACT-R version [Adaptive Control of Thought-Rational] (Anderson, 1982, 2005; Anderson and Lebiere, 1998; Anderson *et al.,* 2004). Anderson's model has been widely applied in SLA (O'Malley *et al.,* 1987; Johnson, 1996, 2008; DeKeyser, 1998, 2007a, 2007c).

Anderson's model assumes the two types of knowledge which are widely accepted by contemporary scholars: declarative (DEC) and

procedural (PRO) knowledge. DEC is often referred to as 'knowledge-that', while PRO is 'knowledge-how'. DEC is conscious, while PRO is unconscious, implicit and automatised. In terms of language, the knowledge we have of the structure of the linguistic system and the lexicon is DEC. PRO, on the other hand, is proceduralised and automatised language, escapes consciousness and does not require explicit processing while being used.

4. THE DEC->PRO SEQUENCE AND THE PPP

Anderson's theory is particularly relevant regarding activity sequencing and the order adults adjust to in the acquisition of knowledge in formal contexts. Anderson (1982: 380-381; 2005: 281-282) states that DEC precedes PRO, which results in the cognitive sequence DEC->PRO. Moreover, DEC may lead to PRO after passing through three different phases: cognitive elaboration, associative and autonomous. Anderson's model as applied to language learning (and the PPP; see below) faces some restrictions: they both adjust well to the path followed by adult learners, especially when they attend formal teaching in school, but do not match the process of native language acquisition by children, or by adults when they learn a second language through the interaction with native speakers in real communicative situations. Indeed, although Anderson and Fincham (1994) consider that the ideal procedure for the acquisition of skills – and thus of language learning– is the attainment of a declarative base prior to proceduralisation and automatisation, they also acknowledge that such a declarative base may not always come first.

From a cognitive perspective, the PPP favours and fosters both types of knowledge on the one hand, DEC and PRO, and the DEC->PRO cognitive sequencing, on the other. Firstly, DEC has a parallel in the Presentation stage (P1), since the presentation of linguistic input may include explicit information on specific structures or grammatical points of the language learnt; if there is not explicit information (as was the case in the audio-lingual and other structurally-based methods), the materials are prepared according to elaborate pedagogical or merely linguistic criteria, which are aimed at implicit inductive learning by the students. It should be borne in mind that

some very controlled practice in the shape of fill-in-the-blanks, paraphrasing, etc. can also be targeted at the consolidation of DEC previously explained (DeKeyser, 1998). Secondly, PRO is to be related to P2 (Practice stage) and P3 (Production stage, facilitated by and made possible after previous repetitive practice)[3]. The aim of P2 is to start proceduralization, i.e. the establishment of form-meaning relationships in the mind, whilst P3 targets complete proceduralisation or language automatisation, whose visible result is fluent and error-free production.

5. DEC->PRO AND THE PPP ILLUSTRATED IN A TEACHING UNIT

Research in SLA has a practical side in language teaching and learning. The main characteristic of formal learning is that somebody (the teacher) guides, arranges and controls what the students are supposed to learn. In so doing, the materials to which the learners are exposed are typically modelled according to specific pedagogical criteria, implemented in textbooks and other classroom materials. It should be taken into account that teaching materials may affect the learning processes of the students 'from outside', whether or not distorting the inner and built-in processes of the brain.

If the cognitive processes operative in adults (the sequence DEC->PRO, for example) are to be taken into account by the teaching materials, textbooks could be analysed from that perspective in order to find out whether they adjust or not to those cognitive processes and their underlying sequencing. Since activities constitute the operative pedagogical units, both in textbooks and in the classroom, the analysis of these functional units will reveal, (i) their nature regarding the development of DEC and/or PRO, and (ii) the sequence of the teaching action enhanced.

In what follows the analysis of a case-study to verify up to what extent the unit examined goes in line with the PPP model is reported. Unit 5 (out of a total of 9 units) from a contemporary textbook for teaching English as a Foreign Language in Spanish *Bachillerato*, Level 1 (*Bachillerato Made Easy 1.* Santillana Richmond Publishing) was randomly selected. Units are long and the one analysed has 54

activities. It takes several hours of teaching in the classroom. The unit is planned in sections, around the four skills, plus grammar, pronunciation and vocabulary. Therefore two levels of hierarchisation in the structure of the unit are considered: Level 1 (sections on skills and language use: reading, grammar, vocabulary, listening, pronunciation, speaking, writing), and Level 2 (specific activities within each of the sections).

The analysis takes two axes into consideration: (i) the DEC/PRO types of knowledge and (ii) the PPP phases. In both levels, the parameters are which kind of knowledge is generally favoured (DEC or PRO) and the implied phase from the PPP model in each section or activity. The P-phase of each one of the activities is identified in Level 2 so that the weight of each one of the phases in the unit can be established.

Due to space limitations, only the *main* focus of each section and activity is annotated, but we are conscious of other possible secondary goals in each section or activity, such as the incipient and rudimentary starting of proceduralisation in very controlled practice targeted at consolidating DEC.

Regarding DEC, analysis of whether the activity favours DEC or not in a general way is performed and well-known distinctions in the teaching of DEC are not entered into. DEC may be taught explicitly in either a deductive (statement of rules or item meanings) or inductive mode (i.e., when the learners are told to discover by themselves the rules or meanings underlying isolated samples of language or embedded within an aural or written text which has been previously arranged and pedagogically adapted to include the target linguistic features). DEC can also be taught and learnt implicitly, which entails the absence of learners' consciously driven attention to rules or item meaning. This normally happens in extensive reading and listening, where the main focus is on the text meaning and incidental attention to form is ancillary. Regarding PRO, only whether proceduralisation is enhanced through practice, be it repetitive or of a less mechanical nature (P2 and P3 respectively) is considered.

Concerning Level 1, each section implies the development of DEC and PRO and the related PPP phase as shown in Table 1:

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	Main type of knowledge (DEC or PRO)	**Main PPP phase**
reading	PRO	P2
Grammar	DEC	P1 followed by P2
Vocabulary	DEC	P1 followed by P2
pronunciation	DEC	P1
listening	PRO	P2
Speaking	PRO	P3
Writing	PRO	P3

Table 1. DEC, PRO and the PPP stage in the sections

Regarding Level 2, the total number of activities favouring DEC and PRO is 30 and 18 respectively, whereas that of the P phases emphasised is 23 (P1), 19 (P2) and 6 (P3). Due to space restrictions, only the detailed analysis of a representative sample of the unit (activities 13-25 out of a total of 54) is included. See Table 2:

Activities	**Main type of knowledge (DEC or PRO)**	**Main PPP phase**
Grammar 13. Identify the modal verbs in the sentences.	DEC	P1
14. Can you find other modal verbs in the text?	DEC	P1
15. Match these sentences to the modal use.	DEC	P1
16. Fill in the gaps with the help of the previous activities. Follow the example.	DEC	P2
17. Look at these conditional sentences (1st type) and answer the questions below to find	DEC	P1

out how to express conditions.		
18. Look back at the text on page 43. What conditional sentences can you find?	DEC	P1
19. Compare these 2nd type conditional sentences with the ones in the box above.	DEC	P1
20. Join the beginnings and endings using *if*. Follow the example.	DEC	P2
21. Fill in the gaps with the correct word form. Follow the example.	DEC	P2
Vocabulary 22. Some nouns can be followed by certain prepositions. Look at these sentences and identify the "noun + preposition" construction	DEC	P1
23. Look at the sentences above and write two more examples	DEC	P2
24. Put a preposition from the box after the following nouns. Follow the example.	DEC	P2
25. Choose three 'noun + preposition" constructions from the previous activity and make sentences of your own.	PRO	P2
(Adverbs of degree) 26. Identify the degree adverbs in these sentences.	DEC	P1
27. What words do they	DEC	P1

usually modify?		
28. Is it the same in your own language?	DEC	P1
29. Put the adverbs in the correct column. Follow the example.	DEC	P1
30. Choose an adverb from each of the columns and make a sentence of your own	DEC	P1
31. Look at the following words. What do they have in common?	DEC	P1
32. Put the verbs into the corresponding box by adding a suffix. Follow the examples.	DEC	P1
33. Error analysis	DEC	P1
TOTAL IN THE WHOLE UNIT	DEC: 30 PRO: 18	P1: 23 P2: 19 P3: 6

Table 2. DEC, PRO and the P phase in each activity from the grammar and vocabulary sections

6. ANALYSIS OF DATA

As can be seen in Graph 1, with respect to Level 1 (sections in the unit), PRO is abundant in the four skill sections (reading, listening, speaking and writing). Conversely, DEC prevails in the three sections across the skills (grammar, vocabulary and pronunciation). From the analysis of the sections, the unit may be defined as favouring both DEC and PRO, and in this order, with the exception of a few initial activities (warm-up), whose prototypical function is to raise students' attention to certain language features and increase their motivation by engaging in a discussion. Regarding P-phases, P1 prevails in three sections (grammar, vocabulary and pronunciation, as it was the case for DEC), P2 in two sections (reading and listening), and P3 in two sections (speaking and writing). See Graph 2.

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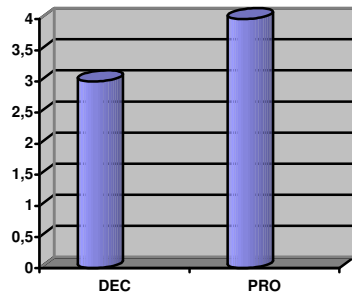
Graph 1. DEC and PRO in the unit   Graph 2. P-Phases in the unit sections
sections (Level 1)   (Level 1)
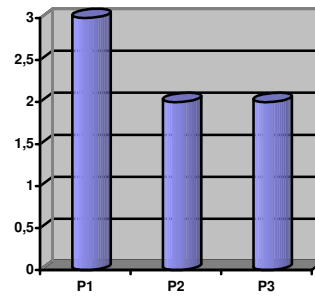
The analysis of each one of the activities (Level 2) reveals a somewhat different tendency from the results in Level 1, given that the sections do not present an equal number of activities. For example, 'Speaking' only has 1 activity, whilst 'Vocabulary' contains 11 activities.

Regarding the development of DEC or PRO, DEC is favoured in 30 activities, while PRO only in 18 (see Graph 3), as opposed to the development of DEC in three sections and of PRO in four as shown in Graph 1:
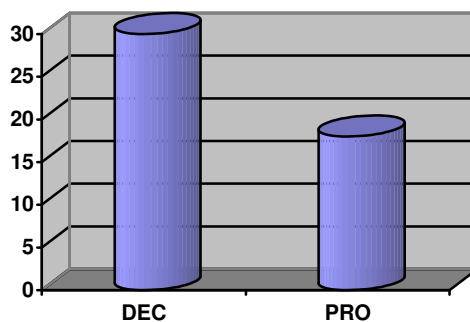
Graph 3. Presence of DEC and PRO as considered in the unit activities (Level 2)

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As to the PPP phases, the presentation phase (P1) is first in frequency (23 activities), followed by P2 (19 activities) and P3 (6 activities). The load of P3 is very low in the unit. The P1 and P2 figures are slightly different from those of Level 1, where P1 is present in 3 sections and P2 in 4. See Graph 4.
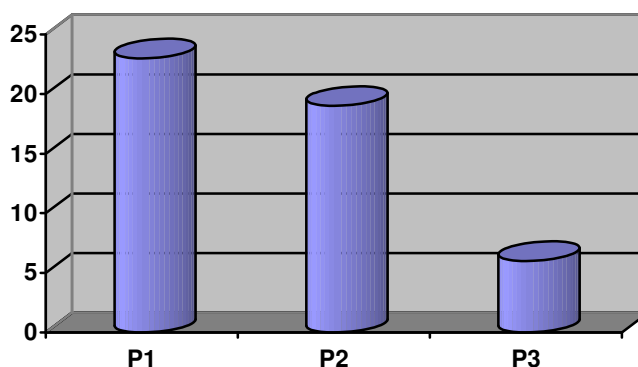
Graph 4. Presence of each P phase in the unit activities (Level 2)

A most outstanding finding is the lower frequency of P2 if compared to P1 and the scarce presence of P3 (i.e. fostering proceduralisation and automatisation). P1 equals the frequency of P2+P3 together. The low frequency of P2 is especially significant taking into account that this book is addressed to 2nd year *Bachillerato* students, who should reach a complete B1 (old intermediate level) at the end of their studies. B1 is the first of the two Independent levels distinguished by the *Common European Framework of Languages* (2001). In order to become "independent users", the students need to have achieved an "operative" and "applicable" knowledge of grammar and vocabulary to communicative situations instead of reaching a declarative stage alone. In other words, they should have received many opportunities for proceduralisation before engaging in automatisation. This entails practice with different and challenging sentences, which obliges them to pay attention to meaning while declarative knowledge is still active in processing (i.e. there is some sort of attention to form, as students consciously search in their

declarative memory to find the right forms which transmit meaning). Communicative drills, absent in this unit, can contribute to such a purpose (DeKeyser, 1998, 2007b). Thus, as the analysis of this unit reveals, it seems that proceduralisation is not sufficiently catered for so that full automatisation can be attained in later year(s) when students enrol in B2 and C1 levels.

7. CONCLUDING REMARKS

It is time to check whether innovations and findings in research –particularly those derived from SLA studies– have reached the teaching arena. If it is so, textbooks and classes should reflect those changes in some way. If we centre on textbooks, the ideal cognitive path designed by textbook authors should comply with the natural learning path of students in instructional settings. As argued above regarding adults' learning path, two facts are undeniable: (i) the role of both DEC and PRO in formal teaching contexts and in individual learning, together with (ii) the frequency of the sequence DEC>PRO in adult knowledge acquisition and consolidation. This means that, in those same contexts, DEC prevails over PRO and precedes it. That is, adults typically gain consciousness of what they want to learn before proceduralising it. This is accounted for by the fact that, in comparison with children's, adults' working memory is larger and allows the latter to rely more on DEC. Given that consciousness depends on working memory, the predominance of DEC in learning is a logical development.

The unit analysed adjusts partially to the cognitive model described above, but not as much as the PPP does. The data resulting from the analysis of the unit shows that,

(i) It offers more opportunities for attaining declarative rather than procedural knowledge (30 activities favour DEC and 18 favour PRO).

(ii) The DEC->PRO sequence, however, does not generally prevail in the lesson. If we take each section as a self-contained unit in which a well defined sequence may be developed, we notice that the grammar, vocabulary, writing and listening sections follow the DEC->PRO cognitive sequence. The reading section conveys a PRO->DEC

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sequence with a major presence of activities fostering PRO, similar to the listening section –according to their focus on skill receptive practice (P2). The speaking section entails PRO alone as compliant with its productive nature.

(iii) The prevalence of DEC over PRO and the 'cohabitation' of the DEC->PRO and the PRO->DEC cognitive sequencing models offer opportunities for both deductive and inductive learning. It partially adjusts to Anderson's cognitive model in adults, but at the same time it also favours inductive learning, as advocated by natural teaching methods, which highlight the role of the input in language acquisition.

The role of explicit deductive and implicit inductive processes in this unit may be shocking to readers used to establishing barriers between methods. The results found here suggest that such barriers are not necessarily real (see Criado-Sánchez and Sánchez, 2009). Differences may often be lighter than expected. So it seems to be the case with the textbook under analysis. Although the authors should follow the CLT –as prescribed by the official Spanish syllabus– the activities offered and the underlying pattern of activity organisation combine the PPP, or the 'classical school model' (Sánchez, 2001) with the CLT. Practice of various kinds (receptive and productive P2, PRO) sometimes initiate the section and precede the presentation stage (P1, DEC), but there are as many other instances in which the presentation stage (P1, DEC) is placed first, followed by productive practice (P2, P3, PRO).

It seems that the book complies with two opposing trends: the CLT on the one hand and the 'real classroom' and learning practices of adult students on the other. The textbook gives in to DEC, in spite of the prevailing role which should be assigned to PRO, according to the official syllabus. From a cognitive perspective though, it seems that the basics regarding the role of DEC and PRO and their fostering in learning are partially kept.

NOTES

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[2] For the purposes of this paper, second language and foreign language are regarded as synonyms, i.e. a language which is not the L1.

[3] For the purposes of this paper, the beginning and intermediate phases of proceduralisation will be referred to as PRO, in the same way as the full attainment of proceduralisation and final automatisation.

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