

**ЗАКАРПАТСЬКИЙ УГОРСЬКИЙ
ПЕДАГОГІЧНИЙ ІНСТИТУТ
ПЕДАГОГІЧНИЙ ФАКУЛЬТЕТ
СОРВОШСЬКОГО ІНСТИТУТУ ім. Ш. ТЕШЕДІКА**

СПІЛЬНІ ЦІННОСТІ

Збірка наукових праць

За редакцією *Габоди Б.* та *Липчеї І.*

**ПоліПрінт
Ужгород - 2004**

**KÁRPÁTALJAI MAGYAR TANÁRKÉPZŐ FŐISKOLA
(BEREGSZÁSZ)**

**TESSEDIK SÁMUEL FŐISKOLA
PEDAGÓGIAI FŐISKOLAI KAR (SZARVAS)**

KÖZÖS ÉRTÉKEINK

Tanulmánykötet

Szerkesztette: *Gabóda Béla és Lipcsei Imre*

**PoliPrint
Ungvár - 2004**

ББК 74(4УКР)
С 72
УДК 37(477.87)

A tanulmánykötet a Kárpátaljai Magyar Tanárképző Főiskola (Beregszász) és a Tessedik Sámuel Főiskola Pedagógia Kara (Szarvas) tanárainak a tanulmányait-dolgozatait tartalmazza.

A kötetben elsősorban a két főiskola azon pedagógusainak társadalomtudományból, nyelvtudományból, természettudományból íródott tanulmányait válogattuk össze, akik doktori képzésben vesznek részt Magyarországon, illetve Ukrajnában.

A tanulmányok magyar, német, ukrán és angol nyelven íródtak.

Збірка містить наукові статті викладачів Закарпатського угорського педагогічного інституту та Педагогічного факультету Сорвошського інституту ім. Ш. Тешедіка.

У збірці висвітлюються актуальні проблеми гуманітарних та соціально-економічних наук.

Статті написані угорською та англійською мовами.

ISBN 966-7966-19-4

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PoliPrint Kft
Ungvár, Turgenyev u. 2.
Felelős vezető: Kovács Dezső

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THE CRITICAL PERIOD LOOKED AT FROM THE NEUROLOGICAL PERSPECTIVE

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Introduction

It is generally assumed that age is a factor that has an impact on learning a foreign or second language. The problem of age in foreign or second language acquisition is quite controversial: researchers have not yet arrived at a consensus. The main question, which causes a dilemma among researchers, is whether adults or children are better learners of a foreign or second language. There is no clear-cut answer to this question, though a great number of studies have been conducted to investigate the effect of age on foreign or second language learning and what role it plays in the process of foreign or second language acquisition (Johnson & Newport, 1989; Ehrman & Oxford, 1990; Johnson, 1992; Ioup *et al.*, 1994; Bongaerts *et al.*, 1997; DeKeyser, 2000; Nikolov, 2000b; Ottó, 2000).

In recent years, due to different factors, e.g. parents' belief in children's early start with regard to foreign language learning (Nunan, 1999), foreign language teaching to young learners has been introduced to the curriculum in countries like Ukraine, Italy or Slovakia. Two informative papers were published about the Slovakian and Italian experience with teaching English to young learners in 2000 (Farkasová & Biskupicová, 2000; Hill, 2000). One of them (Farkasová & Biskupicová, 2000), report on "an innovative project involving first foreign language from the very beginning of school" (p. 121), while the other (Hill, 2000) provides insights into the problems and success of introducing foreign language teaching to the elementary school curriculum in Italy.

Thus, current trends tend to give way to 'the younger = the better' assumption, but whether the younger is really the better is another matter. The present paper tries to give empirical evidence for the highly debated hypothesis of the critical period in foreign or second language acquisition and give explanations for it from a special perspective, the neurological one.

Explanations for the critical period: Evidence from second language

The critical period hypothesis claims that there is a period of time in people's life during which it is easier to learn a foreign language and if they start learning this language after this period, they will not achieve as good results as they could have reached if they began the process before this period (Lenneberg, 1967). The critical period has its 'strong version' and 'weaker version' (Singleton, 1989). The strong version says that even if one starts acquiring a language within the critical period, this acquisition will not extend beyond this stretch of time. On the other hand, the weaker version asserts that the earlier language acquisition starts after the onset of the critical period the better, but it does not claim that beyond this period foreign or second language learning is impossible (Singleton, 1989).

There is a debate over when this period begins and when it is over. Scovel (1988) argues that this period occurs around puberty. Long (1990) defines the limit of the critical period as age six. I do not share the view of Long in that it is age six that is a crucial point in acquiring a foreign language, because there are hundreds of thousands of examples proving the opposite of Long's theory. But I agree with Scovel that if there exists a critical period, it must occur around pre-puberty, which in my understanding is around age ten.

As for the explanations for the differences in language learning related to age, Larsen-Freeman and Long (1991) provide four kinds of. These are the following (pp.163-164):

- social-psychological explanation;
- cognitive explanation;
- input explanation;
- neurological explanation.

In a comprehensive review, Nikolov (2000a) also presents four various explanations, similar to those by Larsen-Freeman and Long (1991), with the difference that Nikolov (2000a) talks about the linguistic argument for the critical period instead of the input explanation.

On the other hand, Ellis gives six explanations for the same phenomenon (1994, p. 494):

- sensory acuity;
- neurological;
- affective-motivational factors;
- cognitive factors;

- input;
- storage of L2 information.

One essential question of controversy is whether environmental factors are responsible for dissimilarities between child and adult language learners, or it is the alteration in the neurological mechanism that is in charge. Long (1990) believes in the neurological explanation. Ellis (1994) throws light on the main arguments for each of the explanations, he says that “child learners are more strongly motivated to communicate with native speakers and to integrate culturally” (p. 494).

Ellis (1994) says that the critical period hypothesis supports the belief that younger learners on the whole learn a foreign or second language better than adults. In her study of the critical period effects in second language acquisition, Johnson (1992) wanted to test the view held by Ellis (1994). She investigated 27 native Chinese and Korean speakers studying English as a second language who “arrived in the United States between the ages of three and thirty-seven years” (Johnson, 1992, p. 222). Having analysed the results, she found that the age of arrival correlated with performance on a written grammaticality judgement task and that those who arrived at an earlier age outperformed those who arrived at a later age. Besides the written test of English grammar, an auditory grammaticality judgement task was also employed and the results of both tests showed “the existence of a decline in grammatical knowledge with older ages of learning” (Johnson, 1992, p. 241). In my interpretation, the younger the language learner when first exposed to a foreign or second language, the greater his or her grammatical competence will be. Thus, Johnson (1992) came to the final conclusion that when very young children pick up a language (either first or second), in most of the cases they arrive at native or native-like grammatical competence in the learned language, while adult learners seldom attain native levels of competence.

Neufeld (1979) questioned the existence of a critical period, so in his research he used a small number of tapes prepared by adult learners of French. These were misidentified as native speakers. Thus, Neufeld claims that “accent-free second language performance is possible and that, therefore, there is no sensitive period for SLA” (Neufeld, 1979). One cannot generalise the findings of Neufeld’s research because there are some limitations to this study (e.g. incorrect wording of the judges’ / raters’ instructions, extreme limitation on speech sample).

In contrast, Ioup, Boustagui, Tigi and Moselle (1994) report about a study in which they investigated a naturalistic adult language learner of

Egyptian Arabic — a native speaker of English — with the help of different measures to assess her level of achievement: a speech production task, a grammaticality judgement task, a translation task, an anaphoric interpretation task, an accent recognition task. Her results were compared to native Egyptian Arabic speakers and to those of a proficient learner of Egyptian Arabic who obtained formal instruction in this language. The findings show that unlike most naturalistic language learners reported in the academic literature, the participant of Ioup et al.'s research did attain native proficiency in her target language, in this way refusing the statement of Klein (1986) who claims that "... it is reasonable to assume that little progress is made after the age of puberty" (p. 9). However, one must admit that the subject in the Ioup et al. study was highly motivated to learn the language — she was married to a native speaker of Egyptian Arabic: an affective factor that must trigger language acquisition to a great extent.

Nikolov (2000b) has conducted a study whose findings challenge the strong version of the critical period hypothesis. In her research, Nikolov aims to refute the strong version of the critical period hypothesis which claims that native-like pronunciation cannot be achieved if the learning of a foreign or second language does not begin before a critical age (Scovel, 1988). The investigator's main purpose was to discover whether near-native proficiency could be obtained by adults beginning to learn a foreign language after puberty and whether these learners could be misidentified as native speakers on a tape (Nikolov, 2000b). Although the author admits that there are limitations of the study, nonetheless she concludes that the findings of her research have demonstrated that one cannot support the strong version of the critical period hypothesis and that adult learners, i.e. people who commence SLA after puberty, can hope to achieve native-like proficiency in a new language.

In brief, there is evidence and counter-evidence for the existence and effects of the critical period. What follows is an overview of the theoretical arguments for the critical period from a neurological perspective.

The critical period from the neurobiological perspective

Jacobs and Schumann (1992) claim that investigators studying the cognitive processes underlying language acquisition need to have a clear picture of how the brain works. They attempt to illuminate the basic methodology one needs in such research. So, they consider that

Neurobiology refers to the nervous system in all species, including how the nervous system interacts with the environment. Neurobiological findings, especially those related to plasticity, memory and learning, apply at a basic level to the language acquisition process (Jacobs & Schumann, 1992, p. 283).

This brain plasticity was first touched upon by Penfield and Roberts(1959), who attributed the child's greater ability to learn a language to it. Lenneberg (1967) also mentioned that the critical period for language learning has some neurological bases.

Researchers investigating critical period effects on language acquisition have often appeared with some nerve or brain-based models (Sokolik, 1990; Pulvermuller & Schumann, 1994; Ottó, 2001; Ullman, 2001). The Connectionist Model for solving the 'Adult Language Learning Paradox' was fostered by Sokolik (1990), according to whose view adults should have an advantage over children in learning a second language because it is easier for them to generalise and recognise rules from experience.

Pulvermuller and Schumann (1994) propose a brain-based model for language acquisition. Their model works well if two conditions are given "in order to acquire full knowledge of a particular language":

1. the learner is motivated to acquire the language;
2. the learner has the ability to gain grammatical knowledge.

In their understanding, motivation (m) and the ability to acquire grammatical knowledge (g) are of crucial importance. Thus, Pulvermuller and Schumann (1994) describe an early learner who is motivated and has a perfect ability to acquire grammatical knowledge as [+m; +g]. Consequently, a person who is not motivated to learn a language and his or her grammar acquisition mechanism is deficient, is described as [-m; -g]. In Pulvermuller and Schumann's (1994) view, the value [-g] does not only refer to morphological and syntactical acquisition deficit, but can point to phonological deficit as well.

Pulvermuller and Schumann (1994) also express their views on the neurobiological theory of language acquisition, stating that strengthening of connections between neurons probably represents the neurobiological basis of learning:

Neurons in the cerebral cortex, in particular those of the language areas of Broca and Wernicke, play a crucial role in language acquisition (p. 691).

Another model introduced by Ullman (2001) is the declarative/procedural model. He makes a clear distinction between ‘the memorised mental lexicon’ and ‘the computational mental grammar’, saying that “the lexicon contains memorised words — that is, pairings of sound and meaning” (p. 105), while the grammar contains rules, i.e. it “subserves the computation of compositional linguistic forms whose meanings are transparently derivable from their structures” (p. 105). Ullman claims that his model addresses representational, computational, and neural aspects of the lexicon and grammar. According to the model, declarative memory rooted in the temporal lobe structures subserves the lexicon, while procedural memory rooted in left frontal/basal-ganglia structures, subserves aspects of grammar. The model is supported by psycholinguistic and neurolinguistic evidence.

In their article on the relations of age and second language (L2) learning, Marinova-Todd, Marshall and Snow (2000) put forward their idea that there are three misconceptions about age and L2 learning, namely, “misinterpretation of the facts relating to speed of acquisition, misattribution of age differences in language abilities to biological factors, and, most notably, a misemphasis on poor adult learners and an underemphasis on adults who master L2s to nativelike levels” (p. 9). Having analysed a great many of studies concerning age and L2 learning, they state that differences in speed of processing of input in L2, etc., have been frequently misattributed by neuroscientists who consider that these factors can account for differences between children and adults in their proficiency levels or the poorer performance of older learners. They criticise these studies for their improper subject selection, i.e. they believe that the participants of these studies (early and late learners) were carelessly selected on the basis of equal proficiency levels. In their comments on the Marinova-Todd et al. (2000) article, Hyltenstam and Abrahamsson (2001) accept that this is “a valid criticism” (p. 160), however, they have objections to the views expressed in the article by Marinova-Todd et al. (2000). They find fallacies with the three misconceptions about age and L2 learning suggested by Marinova-Todd et al. (2000). For example, with regard to the misattributions in neuroscience, they say that the claim of Marinova-Todd et al. (2000) that neuroscientists have misattributed differences between early and late L2 learners to cerebral correlates is nothing more than a simple prejudice against brain science. Hyltenstam and Abrahamsson (2001) ‘blame’ Marinova-Todd, Marshall and Snow for being selective when choosing the facts and ref-

erences to prove their claims and for being faulty when representing research.

In summary, it is difficult to draw final and satisfying conclusions about the role of neurobiological evidence in relation to the critical period in foreign or second language acquisition. What needs to be carried out in the future is convincing research with convincing results.

Conclusion

Age as an individual difference is an often-debated area in SLA. The research that has been carried out on the age issue is tremendous. In sum, experts hold different views about this biological factor. Some researchers stand for the critical period hypothesis (Johnson, 1992), while others refute its relevance (Neufeld, 1979; Nikolov, 2000b).

What concerns the neurobiological bases for the critical period, it is evident that there is no uniform opinion about their relevance and that further investigations are needed into this area of foreign or second language acquisition.

Although I have surveyed a great amount of SLA research addressing the age issue, I am still not completely convinced about the relevance of the critical period hypothesis. Neither am I convinced, despite empirical data, that age has an outstanding role in the process of acquiring a foreign or second language. I believe what makes a big difference in the procedure is constituted by other individual differences, like aptitude and motivation.

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ABSTRAC

A “kritikus periódus” neurológiai szempontból

Huszi Ilona

Kárpátaljai Magyar Tanárképző Főiskola, Nyelvészeti Tanszék

Általánosan elfogadott tény, hogy az idegen nyelvet tanulók életkora fontos és meghatározó szerepet játszik az idegen nyelvek elsajátításának folyamatában. Az életkor idegennyelv-elsajátításban játszott szerepe ellentmondásos, mivel a témát kutatók körében nincs megegyezés ezzel kapcsolatban. A legfontosabb kérdés az, vajon a gyermekek vagy a felnőttek számítanak jobb nyelvtanulóknak. Erre a kérdésre nincs egyértelmű válasz, bár a témával kapcsolatos létező szakirodalom nagynak mondható.

A jelen cikk arra tesz kísérletet, hogy empirikus adatokat sorakoztasson fel, és neurológiai szempontból magyarázza a sokat vitatott kritikus periódus hipotézisét. Ami a kritikus hipotézis neurobiológiai alapjait illeti, a szakirodalomból kitűnik, hogy nincs egységes vélemény a kutatók körében, ezért ezen a területen további empirikus kutatásokra van szükség.

Наукове видання

Спільні цінності

Збірка наукових праць Закарпатського угорського педагогічного інституту та
Педагогічного факультету Сорвошського інституту ім. Ш. Тешедіка

Редактори: *Габода Б. та Ліпчеї І.*
Коректура авторська
Верстка: *Балог Жужанна*
Технічне редагування: *Петрушко Юдіта*

Здано до складання: 17.12.2003. Підписано до друку: 08.09.2004.
Формат: 70x100/16. Папір офс. №1. Гарнітура Times New Roman. Друк офс.
Умовн. друк. арк. 16,45. Тираж 300. Замовлення: 137.

СП “ПоліПрінт”, м. Ужгород, вул. Тургенєва, 2.

**Спільні цінності: Збірка наукових праць / За редакцією Габоди Б. та С 72 Ліпчеї І. – Ужгород: ПоліПрінт, 2004 – 204 с. (угорською, німецькою, українською та англійською мовами).
ISBN 966-7966-19-4**

Збірка містить наукові статті викладачів Закарпатського угорського педагогічного інституту та Педагогічного факультету Сорвошського інституту ім. Ш. Тешедіка.

У збірці висвітлюються актуальні проблеми гуманітарних та соціально-економічних наук.

Статті написані угорською, німецькою, українською та англійською мовами.

**ББК 74(4УКР)
УДК 37(477.87)**