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Puberty as a Critical Period in Teaching English as a Foreign Language

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1 Introduction

Throughout the realm of school and teaching it is well-known that puberty, as a demanding and decisive period in children's physical and psychological development, does not only pose particular difficulties at home but also requires teachers to face the challenge of changing behavioral and attitudinal patterns of their students and the effects on their academic performance.

Lenneberg (1967) was the first author to postulate the *Critical Period Hypothesis* stating that mastering a language is only possible when its acquisition starts before a critical period. As he referred to L1 acquisition only, in the decades that followed, his hypothesis has repeatedly been received and transformed in order to investigate age effects on foreign and second language acquisition. Hence, in the course of chapter 2, the results of four frequently cited studies on the acquisition of English as a foreign language are outlined and critically discussed (Johnson & Newport, 1989; DeKeyser, 2000; DeKeyser, Alfi-Shabtay & Ravid, 2010; Hopp & Schmid, 2013). All of them show a negative correlation between age and ultimate language performance, approximately until the age of 18. Or, to put it differently, in a range of 3 to 18 years, the older the learners are when starting to acquire English, the lower they are likely to score in standardized language tests and the lower their ultimate command of the English language will be. After the age of 18, however, no such age effects could be proven.

Moreover, without going into detail for the time being, the average scores of the studies suggest puberty as a phase in which the language performance of the participants shows a striking decline. However, the authors, if at all, refer to puberty as a period of time rather than a phase of crucial changes of young people's lives. As a consequence, in chapter 3, the neurobiological, behavioral and attitudinal changes teenagers undergo during puberty are given a closer look in order to come up with possible explanations for the decline of performance shown by the studies (especially on the basis of Sambanis, 2013).

Finally, the aim of chapter 4 is to formulate certain approaches and methods which can be taken into consideration by teachers when it comes to teaching adolescents in the EFL classroom. The suggestions are drafted taking into account the presumable sets of rules and regulations which are relevant for teachers in Berlin (e.g. *Rahmenlehrplan*), however, it has to be stated that they serve as a basis or a starting point for further reflection rather than being an exhaustive instruction material, which cannot be given for professions that comprise circumstances and conditions as complex a school system.

2 Critical periods in foreign language learning

The first researcher to postulate the so called *Critical Period Hypothesis* was Lenneberg (1967). He claimed that human beings could only master a language when they start to acquire it before a so called “critical period”. He referred to the period between age 2-12, whereas later researchers like Long (1990, p. 251), for instance, regarded the phase between age 2-6 as critical. Nowadays, if arguing for a critical period in language learning, the onset of puberty is usually named as the end of the critical period as it is well-known that there are striking interindividual differences when it comes to developmental and biological age (cf. Sisk & Zehr, 2005, p. 163), which is why the naming of exact age ranges does not make too much sense.

Be that as it may, in his biological approach, primarily focusing on first language acquisition, Lenneberg (1967) presumed that successful language learning could only take place within the first years of life since after this period the human brain lost its plasticity, i.e. its capacity to change and develop, which then would explain teachers’ impression of limited language mastery success of adult or especially teenage learners when it comes to second or foreign languages. Although, nowadays, it is more or less well-known that this loss of plasticity does not take place (cf. for example Sambanis, 2013 for a summary of relevant findings on the plasticity of the human brain), the majority of studies on second and foreign language acquisition suggests a negative correlation between age of acquisition and ultimate mastery of a foreign language. This is of particular interest as, seemingly paradoxically, the strongest success in terms of language acquisition is achieved by children, who are often regarded as organisms that have not fully developed yet (cf. Strozer, 1994, p. 130). Hence, the aim of this chapter is to summarize and weigh up relevant findings on the relationship between learners’ age and the language proficiency they achieve in order to provide a basis for further reflection on its relevance for the EFL classroom.

After a few rather theoretical dicscussions of Lenneberg’s (1967) hypothesis by Selinker (1972) and Tollefon and Firn (1983), Johnson and Newport (1989) were one of the first to thoroughly examine the *Critical Period Hypothesis* in order to quantitatively confirm its implications. They conducted a study with an experimental group of Chinese and Korean ESL (English as a second language) speakers (n = 46) and a control group with native speakers of American English (n = 23). The ESL speakers had arrived at the United

States at different ages (range: 3-39) and had learnt English for at least five years. During the course of the study, all participants had to prove their knowledge of "syntax and morphology … by [judging] the grammaticality of spoken English sentences" (Johnson & Newport, 1989, p. 70). Whereas the results of the ESL speakers who had arrived in the US at age 3-7 did not differ significantly from those of the native speakers, the older the learners were at their arrival at the US the lower they scored on the standardized language test (cf. table 1).

	natives (n = 23)	**3-7 y. (n = 7)**	**8-10 y. (n = 8)**	**11-15 y. (n = 8)**	**17-39 y. (n = 23)**
Means	268.8	269.3	256.0	235.9	210.3
SD	2.9	2.8	6.0	13.6	22.8
Range	275-265	272-264	263-247	251-212	254-163

maximum score = 276

Table 1: Mean scores (Johnson & Newport, 1989, p. 78)

Grouping the subjects into two large, equal groups of 23 participants each (ages 3-15 and 17-39 at first exposure), the authors found a remarkably negative correlation between age and test performance for the 3-15 group ($r = -.87$, $p < .01$). In contrast, for the learning group that had firstly been exposed to English at the ages of 17-39, this correlation was only -.16 and not even statistically significant (Johnson & Newport, 1989, pp. 78f).

Giving Johnson and Newport's (1989) study design a more critical look, first of all, one could affirm that the number of participants they tested was too small in order to be able to make generalizations. Moreover, the two groups they formed for their statistical analysis (age groups 3-15 and 17-39) remain rather undifferentiated and, this way, make it very hard to draw any conclusions whether certain critical maturational states, ages or periods of learners had an effect on their ultimate success in language acquisition. Having a look at the results of the study (cf. table 1) and the non-existent correlation between age and test score after the age of 17, however, one could come to the conclusion that after the beginning of adulthood, age does not have a significant influence on the learning of a foreign or second language. As the lower mean scores of older learners suggest otherwise, the low and statistically insignificant correlation may be attributable to the rising interindividual differences (cf. the standard deviations rising along with age of exposure) or another unknown factor, which would have to be further investigated.

DeKeyser (2000) aimed at replicating and elaborating on these findings by conducting a study with 57 Hungarian immigrants in the US. His aim was threefold. First, he

wanted to reidentify and confirm the negative correlation between age of acquisition and ultimate language performance. Moreover, he intended to examine a presumable (positive) correlation between verbal aptitude and performance. In this context, *verbal aptitude* is understood as the ability to talentedly spell and use words correctly, to apply grammar rules appropriately and to semantically and pragmatically grasp word and sentence meaning. Finally, another goal was to show that the performance concerning different aspects and characteristics of a language, diverse grammatical and lexical phenomena, for instance, do not correlate identically with the age of acquisition.

Indeed, he was able to replicate Johnson and Newport's (1989) findings and calculated a correlation between age of acquisition and the performance in a standardized language examination of $r = -.63$ ($p < .001$) for younger learners and no such statistically significant correlations for adult learners although, on the whole, they scored, accordingly to the study conducted by Johnson and Newport (1989), lower than younger learners (DeKeyser, 2000, p. 510). However, adding to their findings, the results of DeKeyser's (2000, p. 500) study suggest a gradual and not a sudden decline in test scores from ages 6/7-16/17 and partly even beyond this age.

Furthermore, DeKeyser (2000, pp. 514f) could confirm a correlation between adult learners' verbal aptitude and their ultimate success ($r = .33$, $p < .05$), whereas this interrelationship could not be found in younger learners ($r = .07$, n.s.), which might imply that teenagers, on the whole, are very well capable of learning a foreign language, regardless of presumable talents. However, these findings should be considered cautiously as the author used a "Modern Language Aptitude Test" which was published by Carrol and Sapon (1959) more than 40 years before the conduction of the study. Hence, it remains questionable whether the criteria for test quality and the topicality of the standardization are met.

Ten years later, DeKeyser, Alfi-Shabtay and Ravid (2010) were able to elaborate on these findings and narrow down the period, in which verbal aptitude and performance seem to correlate most. They found that only between age 18-40 there is a significant correlation ($r = .44$, $p < .05$) between verbal aptitude and language performance.

Both Johnson and Newport (1989, p. 87f) and DeKeyser (2000, p. 515) were able to verify the hypothesis that the mastery of different lexical and grammatical phenomena of English correlates differently with the age of the acquiring learners. The following table shows the correlation between the number of errors committed by the participants and their

age when they were first exposed to English. It can be seen that some phenomena, the third person singular morpheme in the simple present tense, for instance, are less prone to negative age effects than tense mistakes.

3rd person singular	.29*
present progressive	.32*
wh-questions	.39**
particles	.44**
auxiliaries	.45**
word order	.48**
yes-no-questions	.50**
subcategorization	.53**
determiners	.64**
pronouns	.73**
plural	.75**
past tense	.79**

** p < .05, ** p < .01*

Table 2: Correlation between age of arrival and number of errors per rule type (Johnson & Newport, 1989, p. 88)

All the correlations discussed above are not inherent to English as a foreign or second language. For example, in the second part of their study, DeKeyser et al. (2010, p. 422f) could show that age of acquisition and ultimate attainment correlate negatively for both English L2 speakers ($r = -.80$, $p < .001$) and Hebrew L2 speakers ($r = -.79$, $p < .001$).

A more positive view is provided by the study on pronunciation conducted by Hopp and Schmid (2013). They showed, on the one hand, that learning a language from birth is not guaranteeing a 'native like' pronunciation at later stages of life and, on the other hand, even more relevant for the EFL classroom, late language acquisition does not generally prevent it. They formed three groups: 1. German monolinguals (n = 20), 2. L1 speakers of German / L2 speakers of Dutch (n = 40), 3. L1 speakers of Dutch / L2 speakers of German (n = 40). Their "foreign accent" in German speech production was rated by 130 raters and quantitatively expressed via an FAR ("Foreign Accent Rating") score (p. 365).

The results show that German monolinguals, as expected, have the lowest FAR score of M = 2.36 (SD = .95) whereas German bilinguals who speak German as their first language or mother tongue showed an FAR score of M = 2.79 (SD = 1.25). Rather surprisingly, German bilinguals who speak German as their second language received an

average FAR score of M = 2.79 (SD = 1.46), too. Descriptively speaking, the only difference between these two groups seems to lie in the interinvidiual differences of the participants (cf. standard deviations). Hence, the authors conducted a one-way ANOVA (p. 377), which could prove that all three groups differed significantly from one another ($F(2, 98) = 14.033$, $p < .001$, $\eta^2 = 0.47$) and that group membership explains 47% of the FAR score variance. Although all participants of the study were between 24 and 85 years old and therefore do not represent the different age groups discussed in the previous studies, it can be stated that, in a way, they showed divergent results as far as ultimate attainment is concerned. In contrast to the participants in the previously discussed studies, the subjects in Hopp and Schmid (2013) showed that age does not prevent near-native or even 'native like' pronunciation skills, even in languages whose phonetics are not less challenging than the English sound system

At this stage of the discussion, at least two conclusions can be drawn. It could be seen that verbal aptitude or, to put it differently, talent does not play a vital role in learning attainment of younger learners. As it does only have a statistically significant effect when it comes to learners firstly exposed to English at later stages of their life, it can be assumed that younger learners and teenagers in particular are very well capable of learning English even during difficult phases in life, such as puberty. However, there is a notable decline in performance gradually taking place along with the aging process until the age of 17/18, which should not be neglected. The studies discussed rarely mentioned the term puberty when referring to the phase between age 10/11-18 and, when doing so, only used it to refer to a certain point or period in time without considering possible reasons for the changes taking place in that time. Thus, the following chapter will try to have a look at the developments and changes teenagers undergo during puberty and discuss their relation to difficulties in the EFL classroom.

3 Teenagers as special language learners

As it has already been indicated in the course of the previous discussion, puberty appears to be a critical period, not only in general but also in terms of success in language learning. Hence, the aim of the following chapter is to outline the changes teenagers undergo during the process of growing up and link these changes of brain structures, behavior, feelings and attitudes to their performance in the EFL classroom.

Puberty can be described as an individual process every person experiences during his or her lifetime. However, one cannot speak of it as a uniform episode as there are great interindividual differences in terms of quantity and quality, as there is no fixed date or age when it starts or ends. Whereas some biologists assume that the onset of puberty is genetically programmed, others deem further aspects, such as nutritional level or environmental factors, as significant (cf. Strozer, 1994, p. 132). There are, however, some neurobiological factors that have been proven to have an influence on the commencement of puberty, such as hormones, for instance, which shall be given a closer look in the following.

3.1 Neurobiological changes

Hormones, as already mentioned, play a vital but not an exclusive role when it comes to the onset and development of puberty. At some stage in young people's lives, the hypothalamus, the ventral part of the diencephalon ("interbrain", located between cerebrum and brain stem), triggers the release of certain hormones which then initiate this extensive process which will take from one up to six years to come to an end (Sambanis, 2013, p. 69; for a more detailed neurological description see Sisk & Zehr, 2005, p. 164).

At the beginning of puberty, the human brain starts to create a huge amount of synapses in order to provide a basis for the final development it will undergo in the following months and years. Those synapses which are activated due to the reception of certain stimuli will remain, whereas those the young adult does not use will vanish or will not be activated equally well at later stages of life. These processes of "exuberant synaptogenesis" (Huttenlocher & Dabholkar, 1997, p. 167) usually take place before certain periods that are crucial in human development. This might be one of the reasons why young children, for example, seem to have less problems when it comes to learning to walk or the acquisition of languages. Therefore, puberty should not be regarded as a problematic process which is to be endured but rather as a chance (cf. Sambanis 2013, p. 67) since the exuberant synaptogenesis provides the 'young adults' with great developmental potential which should not go unused.

Another aspect of neurobiological change of teenagers' brains, besides hormonal changes and synaptogenesis, is the shift of functions from certain areas to other parts of the brain (Blakemore, Burnett & Dahl, 2010, p. 927). Very generally speaking, this reorganization and restructuration of the brain takes place from the back to the front, i.e. tasks which were formerly performed by the back regions of the brain begin to be carried out by

frontal regions. As the prefrontal cortex, which is, among others, responsible for the planning, reflection and regulation of actions, finishes its development last, it is not surprising that teenagers show a behavior that is characterized by taking more risks and a lack of reflection and impulse control (cf. Sambanis 2013, pp. 70-72 and Lenroot & Giedd, 2006 for a summary of key events in brain development).[1] Moreover, Green, Crinion and Price (2007, pp. 191-193) could show that the cortical regions, especially the parietal cortex, are particularly important in terms of the acquisition of lexical items. They draw this conclusion due to a strong correlation between an increased density of gray matter in this particular regions and vocabulary knowledge of the subjects they examined. Consequently, in the synaptogenesis might lie a great potential for the acquisition of knowledge and competences, however, the reorganization of the brain might hinder this very acquisition.

Adding to this, the consolidation processes of the human brain should be given a closer look. Learning, as a both active and receptive process, on the whole, consists of encoding and consolidation. The first, encoding, is inevitable for the reception of the sensory input, such as, for instance, auditory or visual stimuli. This input has to be perceived and understood, which means that certain top-down processes (activation of prior knowledge) and bottom-up processes (integration of knowledge into already existing system) are taking place simultaneously. However, without consolidation, this input is very likely to be forgotten. This is why consolidation is necessary (Sambanis, 2013, p. 83).

The hippocampus also plays a vital role when it comes to consolidation processes. Although it is not the place where memories are stored permanently, as its storage capacity is limited, it organizes the newly gathered information and sorts out irrelevant data. Those information the brain considers relevant for the individual are stored in larger regions of the brain, especially in the neocortex. These consolidation processes need time and are liable to disruptions, which is why they are most effectively taking place in phases of little or no interference, such as sleep, for instance (Sambanis 2013, p. 84). Regarding the fact that the functioning of the prefrontal regions develops last in the reorganization process of the teenage brain, it appears to be predictable for teenagers to have problems when it comes to permanently storing knowledge.

Summarizing the previous outline it can be stated that puberty is a phase in which fundamental changes on a neurobiological level are taking place in teenagers' brains. In how far synaptogenesis promotes students' performance or reorganizational shifts of tasks

[1] Chapter 3.2 will go into more detail concerning behavioral and attitudinal changes.

from different brain regions to another is beneficial or disadvantageous for their learning success cannot be stated in absolute numbers. However, the studies presented in chap. 2 suggest that the effects in terms of foreign language performance in situations of examinations tend to be negative. In order to complete the image of changes during puberty, the following subchapter aims to delineate the changes in terms of teenagers' behavior and attitude.

3.2 Behavioral and attitudinal changes

Due to the processes adolescents experience during the course of puberty there cannot only be observed changes on a mere physical or neurobiological level but also in terms of behavior and attitudes. Whereas the first, more tangible transformations potentially reduce brain power and capacities unintentionally, attitudinal and especially behavioral changes may have a more or less willful negative effect on teenage students' academic performance.

Very often puberty leads to changing attitudes towards school and other institutions which are perceived as authoritarian. The relationship between students and teachers begins to change. More often, adolescents show a tendency to question teachers as authorities without any fail and are more likely to refuse to take part in classroom activities they have been very willing to participate in before. Another behavior which can be observed comparatively often in teenagers is that they start to deliberately speak with a German accent although they are very well capable of adapting quite satisfactorily to the rules of English phonetics and pronunciation. One possible reason for this is the endeavor to belong to their peer group by distancing themselves from the subject and the teacher (Sambanis, 2013, pp. 67f). This process of distancing alone can already result in lower grades but, additionally, the already mentioned lacking impulse control may even drive them to express their unwillingness or demotivation in an inappropriate way, which would be another factor adding to potential deficiencies of performance.

But it is not only the mere lacking impulse control that has a possible negative influence on classroom interaction between students and teachers and among students themselves but also the fact that adolescents tend to misinterpret emotional signals sent by others (Sambanis, 2013, p. 74). Considering their overall living situation in which they regularly feel vulnerable and overstrained (p. 73), it is little surprising that teenagers show

the habit of ignoring or deliberately violating the rules of the classroom without contemplating the consequences for their academic success.

The question one should ask oneself is, whether there are certain teaching methods or approaches which take into consideration both the merits and the demerits of teenagers' particular conditions and thereby support their learning process, which might be demanding but not impossible.

4 Approaches to teaching teenagers in the EFL classroom

In chapter 2 it could be seen that, on average, the older the EFL learners are the poorer their further acquisition of language competences will be. These negative age effects could be replicated throughout a variety of studies over the past decades. Chapter 3 examined puberty and its consequences for adolescent learners as a possibly predominant factor on lessening learning success or, to put it more precisely, lower test scores. The question that now arises is, how teachers can deal with the special circumstances of pubescent learners in their classrooms in order to maximize their learning process while simultaneously accepting them as human beings in a difficult and decisive period of their lives.

Especially the latter point should not be neglected. A healthy relationship between students and teacher is the basis for successful learning in the EFL classroom. Teachers need to be aware of the particular needs of their teenage learners and the processes of change they are experiencing. Hence, they should be taken seriously and their achievements should be appreciated rather than sanctioning their impulse-stricken, probably inadequate behavior. In his meta-analysis of over 800 meta-analyses, Hattie (2009) could show that a good relationship between teachers and learners has a very high effect on students' performance (d = .72). As a consequence, striving for a respectful professional and personal relationship between teachers and pupils is not only a humanitarian but also a pedagogic decision.

Nonetheless, the teachers at German regular schools do remain an authority as they are, for instance, obliged to grade students' performance and thereby co-determine their academic success. Although there is no clear consensus on how to manage pubescent classrooms most appropriately, it can be affirmed that authority does not have to be built up on mere strictness or a carrot-and-stick approach. A flat but still existing authority can be created by the teacher's personal fascination for the subject he or she teaches or,

as it has already been mentioned before, by authentically valuing students' endeavor (Sambanis, 2013, pp. 74f).

An easy and didactically recommendable way to value students' effort and importance in the EFL classroom is to provide them with more responsibility when it comes to selecting and working on certain materials and topics and maybe even make them accessible for fellow students (cf. effect sizes found by Hattie, 2009 for discovery learning: d = .31 and reciprocal teaching: d = .74). As they are prone to question the authority of teachers, anyway, it appears to be logical that the older they get the more rights and responsibilities they should be confronted with in order to prepare them for future requirements and demands that life will place on them. Notwithstanding, legal and structurally determined conditions due to certain curricula and school regulations or habits cannot be neglected. Hence, teachers should, on the one hand, promote students' drive for exploration (cf. Sambanis, 2013, p. 71) but, on the other hand, navigate them through the realm of authentic materials and help them to select adequate data and material in accordance with higher ranking rules and regulations.

This way, two requirements formulated in the *Berliner Rahmenlehrpläne* for primary (2006a, pp. 11, 27) and secondary (2006b, pp. 10, 13, 17) education would be met. On the one hand, students are taught to orientate themselves in complex circumstances and take responsibility for themselves and their learning outcome, which is on step into the direction of lifelong learning. On the other hand, the target-group orientation ("Lebensweltbezug" and "Differenzierung nach Interesse") is realized by letting pupils, within the existing limitations and restrictions, select the materials they want to work on themselves. Thus, the discrepancies between classroom and real life are flattened. As a consequence, the teenagers will identify better with the subject matters which may promote the networking of synapses which then will increase the probability of higher learning success.

Particularly the last mentioned fact leads the discussion to a neurobiological level, which has also been discussed in chapter 3. In the course of the discussion in 3.1, it became clear that consolidation processes are inevitable for successful and long-lasting learning. The question that arises is whether teachers can take certain actions in order to promote these neurobiological processes, which are not voluntarily controllable. However, as Sambnis (2013, ch. 3.4) could show, there are two main ways to enhance consolidation: repetition and phases of recess.

Repetition and revision of newly acquired knowledge is often realized through homework. Although the effectiveness of homework is often grounds for discussion, they

are still playing an important role in most schools. Regarding this, Thaler (2012, p. 100, cited from Sambanis, 2013, p. 78) claims that there is a positive correlation between homework, grades and students' achievement. This affirmation is also confirmed by Hattie (2009) who found a small effect of homework on students' performance (d = .29).

However, a problem which can often be observed in teenage classrooms is that students of a certain age completely stop doing any homework. Most certainly, teachers may sanction this behavior with low grades, which does not necessarily have an effect on students as it does not tackle the actual underlying problem but only the symptoms. Therefore, a better way to deal with students who refuse to do homework might be to encourage them to choose between several tasks or to ask them to come up with their own suggestions for homework. This way, they would be, as previously discussed, provided with more responsibility for themselves and their learning process.

Another way of supporting consolidation processes is, as already mentioned above, a sequential alternation of working and pausing phases. As Sambanis (2013, p. 85) points out, consolidation works best during sleep. Logically, in school, this is not an option, but the meta-strategy of learning directly before going to sleep may very well be taught at school. Despite the impossibility of sleeping in class in order to promote consolidation processes, these can very well be stimulated within the EFL classroom. For this, teachers should provide learners with the possibility of working and pausing individually after longer phases of group or whole class work. Thus, students have the opportunity to organize their newly acquired knowledge and to rehearse and elaborate it (p. 84).

All in all, in the course of this chapter it could be seen that there are many approaches and possibilities to maximize teenagers' learning outcome in the EFL classroom. Most certainly, the remarks and discussions outlined within the previous lines are not exhaustive but may be an impetus for further thoughts and research.

5 Conclusions, closing remarks and future prospects

The aim of this final chapter is threefold. First, the most important conclusions drawn from the discussions of the previous chapters shall be briefly summarized. On the basis of this summary, questions and suggestions for further research will be formulated. Finally, whenever it appears to be suitable, criticism and the limitations of the conducted research in the course of this paper will be verbalized.

One of the main findings of this paper is the negative correlation between the age of acquisition of ESL/EFL, i.e. the age when learners start to learn English as a foreign language, and the overall ultimate mastery proven by standardized examinations (cf. chap. 2). However, this negative correlation does not hold true for learners who started the acquisition process after the age of 18 and, hence, after puberty. The neurobiological, behavioral and attitudinal changes teenagers undergo in the course of puberty were presented in chapter 3 and constitute influential and probable reasons for the decline shown in the studies.

For teachers of English as a foreign language, some further conclusions can be drawn from these observations. As age effects reach their peak at the age of 18 and students at school usually start learning English way before this age, one could affirm that there should be less problems at German primary and secondary schools. Nonetheless, one might consider to implement more hours of language teaching into younger learners' schedules as at German elementary schools, for instance, they only have 1 to 2 lessons every week. Even more, one might consider organizing textbooks and other materials accompanying the English lessons in a way that grammar phenomena which have shown to have a higher negative correlation with age are dealt with earlier at school than others. For this, however, further research would have to be conducted in order to support these theses (stated, for example, by Johnson & Newport, 1989) and to consider other aspects of foreign language learning, such as lexis and the language competences (speech and written production, listening and reading comprehension). Especially the competences should be given a closer look as current foreign language didactics has a focus on them rather than on grammatical phenomena. Having in mind that the range of developmental age of 13-year-old teenagers is around 6 years (Sambanis, 2013, p. 71), it is very hard to develop material for the "teenage classroom", as classrooms are formed according to biological and not developmental age.

Having a critical look on the presented studies themselves, the results in question should not go unchallenged. As both participants and raters in the studies were human beings, the criteria for test quality are likely to be less met than in investigations under laboratory conditions of the natural sciences, for instance. To put it more precisely, there was always one factor (ultimate test performance or foreign accent) correlated with another factor, such as different ages of acquisition or verbal attitude. Countless factors, which implicitly influence human beings both psychologically and physically (form of the day, fitness, family conditions, views etc.), are likely to have influenced the study results. This is not a problem but rather a characteristic of research with human resources; however, it should at least be kept in mind when it comes to interpreting the presented data.

Finalizing this paper, it shall be called into question whether the approach adopted by Johnson and Newport (1989), DeKeyser (2000), DeKeyser et al. (2010) and Hopp and Schmid (2013) should be directly transferred when it comes to foreign language learning. Whereas they considered a native speaker level of language as “ultimate attainment”, teachers of foreign language should see “learners of a language primarily as ‘social agents’ … who have tasks (not exclusively language-related) to accomplish” (Common European Framework of Reference for Languages by the European Council, 2001, p. 9), which rarely requires a language level comparable to that of a native speaker.

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