

# THE IMPORTANCE OF SENIORS' EDUCATION FOR THE LEVEL OF THEIR COGNITIVE COMPETENCIES

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## Abstract

Cognitive competencies of adults are described by different theoretical models, most often in empirical research using the information processing model and the genetic-development model. In the first case, individual processes, such as the speed and accuracy of information processing, are tested. The second model tests the ability to solve abstract, laboratory and practical problems. From middle adulthood, competencies in abstract thinking are reduced, but training limits this decline (Salthouse, 1993, 2006; Sternberg, 1996, Birren, Schaie 2006; Michalska 2015). The ability to solve practical problems is stable and even increases with age of adults (Blanchard-Fields, 2007; Gurba 2016), but it is not known whether education is important for these seniors competencies. The purpose of the study was to determine if the level of cognitive competencies of seniors, measured by the way of solving everyday problems (Test Everyday Problem by Seby, Papini, 1994), depends on their participation in education in the course of the Third Age University. The two groups of seniors: students of the Third Age University (45 persons) and those who did not participate in institutional education (50 persons) were examined. The best solutions presented by the respondents were compared. For the analysis of the level of cognitive competence, the concept of G. Labouvie-Vief (1980) was used.

Keywords: seniors, education, cognitive competencies, development.

## 1 INTRODUCTION

The phase of adulthood, and even more so the senior age, were excluded from the reflection upon development for a long time. The research results indicated a systematic decrease in the level of intelligence from the middle adulthood. Since the middle adulthood (from about 50 years old), a slowdown in cognitive processes, a decrease in speed as well as a decrease in performance level of mental tasks have been observed. The progressive changes in cognitive competences, which have been progressing since the middle adult period, are reflected in the decreasing efficiency in acquiring and using abstract knowledge, and in the memory deficits often present in seniors, particularly in mechanical and direct memory [1].

However, this pattern of exclusively regressive changes in intelligence has been partially questioned when the distinction between fluid and crystallized intelligence has been made<sup>1</sup> [2]. It turned out that in the middle adulthood, fluid intelligence is mainly deteriorating when crystallized intelligence, if it deteriorates in seniors' age, it is definitely to lesser extent than fluid intelligence. Some studies even indicate its progress.

Research on cognitive competences of adults, conducted in the context of the genetic-development approach, also initially supported the thesis about the regressive nature of changes in cognitive processes after reaching adulthood. As compared to adolescents, adults encountered greater difficulties and made more mistakes when solving tasks requiring correct application of formal – operational reasoning. Usually, this concerned so-called laboratory tasks, also known as academic

<sup>1</sup> Fluid intelligence is closely related to the activity of the nervous system and covers the ability to solve novel problems which do not have ready solutions. The tasks most frequently used to estimate its level require the participant to determine the relation between the presented objects or between relations usually having the character of symbols.

Crystallized intelligence is determined by the level of acquired knowledge. It is measured by tasks related to both theoretical knowledge, for example requiring definition of a certain concept as well as practical knowledge, for instance through the question of *why we should pay taxes* (Stuart-Hamilton, 2006).

tasks<sup>2</sup>. Proponents of the J. Piaget's theory of intelligence development in many studies confirmed the thesis of the author according to which the peak of intelligence development falls on the youthful period and after the plateau phase a systematic regress occurs. However, it was also found that the training brought back the seniors, at least to some extent, the ability to correctly solve these tasks [3], [4]. It was also pointed out that in studies aimed at determining the level of adult cognitive competences, problems should be applied with a content referring to their interests and everyday or professional activity [5]. These problems are usually of a social nature, and therefore open, that is, having several correct solutions and containing a conflict situation. The use of such problems in the research on cognitive competences has allowed the authors to recognize the specific features of adult thinking, relatively rarely observed in adolescents, and which provide an effective solution to these tasks. To those features belong: contextuality, allowing the broad background of the problem to be taken into account; systemness and intersystemness, allowing to discover the complexity of systems and their interrelationships; relativism connected with taking into account different perspectives of the analyzed issue, which gives the opportunity to discover new problems; dialectic that allows to synthesize contradictions and capture the dynamics of phenomena.

In its reasoning, the more if it concerns social problems, adults can acquire the skills to integrate emotions, logic and behavior [6], [7], [8]. As the researchers point out, these features of thinking sometimes called post-formal thinking<sup>3</sup> fulfill adaptive functions in the life of an adult person who is confronted with practical, social problems that cannot be resolved satisfactorily based only on logical and abstract thinking [9], [10].

It is also worth mentioning that there is an association between the features of thinking and wisdom defined in the Berlin Paradigm<sup>4</sup> as prudence and far-sightedness in making judgments about real life problems [11], [12].

## 1.1 A contemporary look at the cognitive competence of seniors

Currently, in the research on cognitive competences of seniors increasingly used are the practical problems that tend to be present in their daily lives.

As mentioned at the beginning, with the age from the middle adulthood, the speed of acquiring and collecting new information, especially abstract and not very useful in everyday or even professional activity, is being reduced. These processes are the result of changes in functioning of the nervous system, especially the deterioration of specific brain areas (dorsolateral areas of the prefrontal cortex). However, as the observations of the activity of some senior groups as well as the results of research show, it does not have to mean difficulties in coping with everyday, sometimes difficult, social situations. Seniors in F. Blanchard-Fields studies more effectively than young adults solved complex social issues and more often applied strategies related to social goals. According to the authors of the study, seniors in comparison with young people more effectively solve social problems, because in the process of reasoning they do not limit themselves to the pure logic of facts, but take into account their rich and emotional life experience. The physiological base of this skill is an undisturbed, until late adulthood, functioning of the ventral-medial prefrontal cortex [13], [14].

## 1.2 Education and the quality of seniors' life

The process of education in late adulthood usually takes place outside institutions and takes mainly form of self-education. Among the various forms of institutional education in Poland, the most widespread activity is the Universities of the Third Age (UTA). They are perceived as one of the optimal educational institutions enhancing the development opportunities of the elderly [15]. The dynamic growth in the number of institutions in the world proclaim that there is a high demand for this form of education. Universities of the Third Age operating in Poland implement the formula of education of the elderly, mainly based on the French model, initiated in Toulouse in 1972 [16]. This

<sup>2</sup> These are problems that have one, correct solution that can be discovered after applying the proper algorithm. Most often in the researches the tasks defined on the abstract material are being used.

<sup>3</sup> The term "post-formal thinking" denotes those forms of thinking which, in the opinion of continuators of J. Piaget's theory, are associated with mental structures that develop on the basis of formal and operational schemes.

<sup>4</sup> It is a concept of wisdom developed on the basis of the results of the following stages of research: a) intuitive understanding of wisdom, b) ways of solving hypothetical, difficult life problems (the respondents loudly thought about these problems). Five indicators of wisdom were distinguished: rich factual and procedural knowledge regarding basic life pragmatics, contextual knowledge, relativism of values, tolerance, awareness of uncertainty and coping with it.

model is associated with the university and is characterized by a high level of teaching and research activities. UTA enter the structures of universities, they are associations, they are often subject to cultural centers or libraries. Important for their functioning is the substantive, organizational and financial support of many local social, economic and government forces. The British model, created a little later, is largely independent of university structures, but is based on the mutual support of UTA students [17].

The aim of UTA is to improve the quality of life of elderly people, strengthen their continual education, coordinate gerontological research programs and implement permanent educational programs. Participation in UTA classes affects not only the intellectual development of seniors, but also helps them to make new friends, which counteracts loneliness and exclusion. Classes are focused on promoting activity, discovering talents, developing hobbies. Involvement in volunteering and working for the university does not deprive listeners of the possibility of satisfying individual needs [18]. By implementing them, they develop comprehensively. Mobilizing the elderly enables them to creative use of leisure time, while helping them in social integration and makes it more visible in society [19].

The topics discussed during the UTA classes are related to the interests of seniors, and at the same time constitute an educational offer adequate to the profile of the university organizing the classes. They take place in the form of lectures, seminars, exercises or team projects. Participation in the classes puts the senior in the new role of student, listener, active participant of classes, which compensates for deficiencies in education and knowledge, as well as strengthens his self-esteem [20]. The proactive dimension of UTA activity is also important, especially in the dimension of gerontological prophylaxis. Its purpose is to slow down the aging process and to keep people in physical and mental health until late in the years.

The significance of seniors' education for their quality of life can be described in the context of the set of needs related to aging. Those needs are as follows: 1. coping and self-sufficiency, 2. self-expression, 3. altruistic desire to serve others, 4. influencing something and striving for wisdom, 5. transcendence or rising above age-related limitations. Education of seniors allows them to maintain control over their own lives, preserve and even develop cognitive skills and adaptive abilities. It enables the elderly to exercise their mind and memory, provides orientation in the changing social reality and becomes an opportunity to initiate and sustain social contacts [21], [22]. Educational activities foster self-recognition, self-acceptance, maintain positive thinking, improve the quality of seniors' life, which in turn prevents social marginalization of the elderly [23], [24]. The condition of adaptation to the requirements of everyday life is the ability to solve everyday social problems. As shown earlier, in many cases, seniors are better at dealing with such situations compared to young people [25].

In the context of the alleged studies, the question was asked about the importance of institutional, systematic education of seniors for the level of their skills in solving everyday, practical problems. In order to answer it, research was conducted on the cognitive competence of Polish seniors from two groups: those attending classes at the University of the Third Age and those who do not have such experience.

## **2 METHODOLOGY**

### **2.1 Participants**

Two groups of seniors were examined: students of the second year of the University of the Third Age in Krakow (45 people: women - 33, men - 12) and those who did not take part in institutional education (59 people: women - 41, men - 18) and compared indicated by respondents the best solutions for tasks. The subjects were aged from 61 to 80 years.

### **2.2 Method**

The level of cognitive competence of the participants was tested using the method of Solving Everyday Problems [26] (in the devise of E. Gurba).

The Solving Everyday Problems Test consists of three problems specific to individual developmental periods: adolescence, middle adulthood and seniors' age.

Problem 1 describes the efforts of the mother of an adolescent daughter to persuade the girl to look after the order in her room. The main issue that the respondent is facing is the definition of how a mother should behave when her daughter did not meet her condition

Problem 2 presents the situation of a marriage in which a husband abuses alcohol and neglects his wife's condition: stop drinking, or the wife and children leave him.

Problem 3 concerns an issue important for the elderly, a woman who lives alone in a storey house. Moving up the stairs turns out to be a dangerous activity for her and therefore faces a dilemma: moving from a house into an apartment, or staying in a place with which she is emotionally and sentimentally connected?

The task is to choose one out of five possible solutions designed for each problem. These solutions were developed by the author (E. Gurba) on the basis of answers to open questions provided by the respondents in the pilot studies. Each of them represents one of the levels of thinking development proposed by G. Labouvie-Vief (1 – intra-system level, 1.5 - transition phase between the intra-system and inter-system level, 2 – inter-system level, 2.5 - transition phase between the intra-system and integrated level, 3 - the level of integrated thinking).

The pre-system level describes early childhood. The structure of the Self is defined here by sensorimotor regulations, which are not coordinated within any superior system.

The intra-system level, that is symbolic regulation, characterizes the stage of the development of the Self, on which individual elements are coordinated within individual, abstract systems. It gives the person the possibility of a systematic understanding of reality, which is perceived as linear, causally and systematically arranged by universal and normative laws. At this stage of development, the subject makes reality judgments using unambiguous categories of truth and falsehood, to which he attributes an objective character.

Regulations from the inter-system level are built on the basis of earlier intra-system regulations. Mental operations typical of inter-system regulations allow to perceive reality and logic as separate, equivalent systems and recognize that the same judgment, depending on the context, can be assessed differently. Post-formal thinking based on inter-system regulations allows to coordinate different points of view, consequently the individual is able to accept even mutually exclusive thoughts, feelings or assessments related to a given problem. Adults without giving up ideals, can agree them with the requirements of specific life situations.

Regulations from the autonomous level are shaped at the highest stage of development, according to Labouvie-Vief. The basic regulator here is the Self structure, which functions as a metasystem. It integrates three spheres: thinking, emotions and action. The autonomy of this level means the entity's ability to take responsibility for its own actions and development, while taking into account various types of restrictions

### 3 RESULTS

To determine the importance of institutionalized education, such as the University of the Third Age, for the level of seniors' cognitive competence in the field of solving everyday practical problems t-Student analysis was conducted in which the results of solving individual dilemmas and global results of the whole test were compared by two groups of seniors: participating in the University of the Third Age and those who do not have such experience.

**Table 1.** Comparison (t-Student's analysis) of the levels of solving each problem and global results in the Solving everyday problems Test by two groups of seniors: a. Seniors from the University of the Third Age, b. Not participating in such classes.

Participants	Seniors from the University of the Third Age			Seniors who do not participate in institutionalized education			t	df	p
	M1	SD	N	M2	SD	N			
Problem 1	<b>2,11</b>	<b>0,83</b>	<b>45</b>	<b>1,68</b>	<b>0,82</b>	<b>59</b>	<b>2,66</b>	<b>102</b>	<b>&lt;0,01</b>
Problem 2	2,20	0,89	45	2,25	0,82	59	-0,32	102	0,66
Problem 3	2,33	0,56	45	2,20	0,78	59	0,94	102	0,34
Global result	2,27	0,49	45	2,07	0,51	58	1,82	102	0,07

As the table shows, on the basis of t-Student's analysis it can be concluded that the solution level only for Problem 1 statistically significantly differentiates both groups of seniors: students of the University of the Third Age and those who did not participate in institutional education. The students of the University of the Third Age were more likely than the seniors from the second group to choose solutions containing the features of post-formal thinking.

At the same time, it should be noted that the difference in global results (the average of solutions for all problems) is on the brink of statistical significance.

## 4 CONCLUSIONS

The presented research focused on defining and comparing the level of cognitive competences in the field of the ability to solve everyday problems of two groups of seniors: students of the University of the Third Age and seniors who do not participate in institutional education. The average results from the whole test (being the arithmetic mean of the results of each problem) obtained by these groups differ (on the brink of statistical significance, for  $p = 0.07$ ) in favor of the first group. This group of seniors also achieved significantly higher results by solving Problem 1. The solutions chosen by these participants represent the inter-system level of regulation. As follows from the characteristics of reasoning representing this level presented by Labouvie-Vief, these respondents faced with open, social dilemmas, are able to take into account different perspectives of people involved in problem situations. This proves their ability to see the complexity of the analyzed dilemmas and reflections related to the doubts regarding the correctness of the recommended solution. Such a position favors the attitude of opening to different from their own arguments and views. Some of the seniors – students also chose solutions that emphasized the need to take into account the autonomy of people involved in dilemmas and the need to harmonize their actions with the needs of other people from the environment. Therefore, like in the Blanchard-Fields studies, they appealed to the goals of social nature. In their solutions, they were guided not only by the logic of events and given facts, but also by the sphere of emotional experiences.

Senior participants of organized education in comparison with other seniors revealed a higher level of cognitive competence only in one of the three problems presented to them. The content of this task concerns the conflict of a mother with an adolescent daughter. The solutions of the other two problems did not differentiate the two groups.

The presented results of own research show the possibility of maintaining by elderly people, regardless of their participation in institutional education, a high level of cognitive competence (level of post-formal thinking) in the field of solving practical, social problems, especially when they relate to content close to their experience (middle and late adulthood). The importance of seniors' participation in regular activities became evident in the ways they solved the problem of conflict between the mother and the teenager, quite distant from their current experience. Seniors - students were able to take into account the point of view of the two sides of the conflict and tried to find a compromise solution. While the other respondents were more often interested in the interest of only one of the sides to the dilemma, choosing unambiguous, cause-and-effect solutions, which in the case of social issues is not an effective way to solve them. The differences in the reasoning of the seniors observed in the solution of the Problem 1 may indicate the role of systematic educational activities in enriching various areas of their knowledge and consequently, expanding the perspective of seniors looking at the world, giving greater opportunities to understand the processes and events present in it, and the lives of people at different stages of development. The content of the other two problems allowed the seniors to refer to the knowledge related to their current or recent experience and probably for this reason there were no significant differences in the way they were solved between the analyzed groups. At the same time, it can be assumed that the desire to study at the University of the Third Age is shown above all by seniors who have been active in life so far and have strong cognitive needs and also reveal high cognitive competence regardless of continued education. Therefore, although it must be said that institutional education of seniors plays an important role in maintaining mental ability, self-education is equally important and perhaps even more important, especially when it is accompanied by regular seniors' activities. It can be described as the ability to reflect and use the acquired knowledge, previous social experience and acquired pragmatic knowledge to solve everyday life problems.

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