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### The Relationship Between Level of Intelligence and Autonomy Among Young People with Mental Disabilities Studying Primary Professional Skills in an Inclusive Program

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**Objectives.** In connection with the reform of the system of mental health, the system of residential institutions for psychiatric patients (PRI) and the development of assisted living, the relevance of the socialization of people with mental disorders has increased. An inclusive approach also implies their inclusion in work activities, the creation of opportunities and the organization of support for successful integration into the work environment.

**Methods.** The results of a pilot study of the level of intelligence and the severity of the need for support in young adults with mental disorders are presented. The study involved respondents aged 19 to 42 years (N=20; 9 men, 11 women) with mental disabilities who are being trained in primary professional skills with the aim of possible integration into work activities in the future. We used the standardized "WAIS" (Wechsler Adult Intelligence Scale) and a specially developed "Questionnaire for assessing the degree of independence of persons with mental disorders and the support they need".

**Results.** The study of intelligence revealed a wide range of results — from normative indicators to moderate mental retardation. The need for some degree of support is experienced by everyone, including those who do not have intellectual disabilities. Respondents with lower levels of verbal intelligence show more significant difficulties in autonomy, respectively, they need for more intensive social support.

**Conclusions.** The assessment of the possibility of independent living and mastering professional skills should not be based only on the level of intellectual development. A comprehensive assessment should include the ability for social cognition, communication skills, daily living and social skills. However, lower levels of verbal intelligence determine a greater need for accompaniment, help and support. In future work, it is intended to expand the sample of study individuals by adding comparison groups.

Keywords: assisted living, independence, mental disabilities, included employment, need for assistance, WAIS test

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# Исследование связи уровня интеллектуального развития с показателями автономии у молодых людей с ментальными нарушениями, обучающихся первичным профессиональным навыкам по инклюзивной программе

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**Актуальность и цель.** В связи с реформированием системы психоневрологических интернатов (ПНИ) и развитием системы сопровождаемого проживания возрастает актуальность темы социализации людей с ментальными нарушениями. Инклюзивный подход предполагает также их включение в трудовую деятельность, создание возможностей и организацию сопровождения для успешной интеграции в рабочую среду.

Методы и методики. Представлены результаты пилотажного исследования связи уровня интеллекта и степени выраженности потребности в сопровождении у молодых взрослых с ментальными нарушениями. В исследовании приняли участие респонденты с ментальными нарушениями, проходившие обучение первичным профессиональным навыкам, в возрасте от 19 до 42 лет (N=20; 9 мужчин, 11 женщин) с целью возможной интеграции в дальнейшем в трудовую деятельность. Использовался стандартизированный тест Векслера (взрослый вариант) и специально разработанный «Опросник оценки степени самостоятельности лиц с нарушениями психических функций и необходимого им сопровождения».

**Результаты.** Исследование интеллекта выявило широкий разброс результатов — от нормативных показателей до умеренной умственной отсталости. Потребность в той или иной степени поддержки испытывают все, в том числе и те, у кого не выявлено нарушений интеллекта. При этом у лиц с более низкими показателями вербального интеллекта обнаруживаются и более серьезные трудности в автономии, соответственно, их потребности в интенсивном социальном сопровождении гораздо выше.

**Выводы.** Оценка возможностей самостоятельного проживания и овладения профессиональными навыками не должна опираться только на показатель интеллектуального развития. Комплексная оценка должна проводиться с учетом развития способностей к социальному познанию, навыков коммуникации, бытовых и социальных умений. Тем не менее, у людей с ментальными нарушениями более низкие показатели вербального интеллекта предполагают большую потребность в сопровождении, в помощи и поддержке, чем у людей с более высокими показателями.

**Ключевые слова:** сопровождаемое трудоустройство, ментальные нарушения, потребность в помощи, самостоятельность, самообслуживание, сопровождаемое проживание, тест Векслера

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**Для цитаты:** *Авакян Т.В., Константинова И.С.* Исследование связи уровня интеллектуального развития с показателями автономии у молодых людей с ментальными нарушениями, обучающихся первичным профессиональным навыкам по инклюзивной программе // Аутизм и нарушения развития. 2023. Том 21. № 3. С. 27—36. DOI: https://doi.org/10.17759/autdd.2023210303

#### Introduction

Increasing attention is being paid by specialists, parents and society as a whole to the problem of so-

cialization of people with mental disabilities, including those living in social care institutions. The ongoing reform of the system of psychoneurological residential institutions (PRI) in Russia and the development of

various forms of supported living [2; 4; 8; 9; 10] make an important contribution to the social integration of people with disabilities. Inclusion as a process of creating environmental opportunities for the complete integration of people with physical and intellectual disabilities into social life implies integration into work activities, and this too needs assistance. We can therefore talk about developing an inclusive working environment.

Several foreign meta-analyses on the effectiveness of supported employment programmes have shown the positive impact of work on the quality of life of people with ASD without intellectual disability [14], and on the increased self-esteem and degree of autonomy of adults with various intellectual problems [13]. National authors also emphasise the importance of employment for people with mental disorders and society [5; 6]. The development of an inclusive educational environment has led to the creation of adapted educational programmes enabling vocational skills acquisition, both based on state schools [3] and within specialised social projects [1].

At present, the Regional Charitable Public Organisation "Centre for Therapeutic Pedagogy" runs an inclusive programme called "Gastronomic Model Platform" (GAMP) for the purpose of socialisation and possible integration into further employment, where people with various intellectual disabilities are currently being trained. Level of intellectual development is regarded as a determinant of ability to live autonomously. Investigating the deficient and preserved aspects of intelligence can help to design individual programmes of education and further social support, including later employment. GAMP conducts a comprehensive examination of students to determine their readiness and ability to acquire vocational skills, but

this article will present the results of assessing their intelligence level.

The proposed study aims to investigate the structure of intelligence in young mentally handicapped adults enrolled in GAMP. It is hypothesised that the higher the level of intelligence, the lower will be the need for support in independent living. The tasks were to measure the level of intelligence of the students, to measure the level of autonomy of the students, to analyse and compare the results obtained.

#### Materials and methods

Twenty people with mental disorders participated in the study. The detailed characteristics of the sample are shown in Table 1. Understanding addressed speech as well as using expressive speech for communication is available to all people.

To determine the level of intellectual development we used the standardized Wechsler test (adult version), including 11 subtests [11]. The indicator of verbal intelligence is made up of 6 subtests: Awareness (assesses the total amount and level of knowledge); Comprehension (assesses practical thinking, the ability to draw inferences based on everyday and social experience); Arithmetic (the ability to perform simple arithmetic operations in the mind); Similarity (the ability to think logically, the ability to perform generalization operations); Repetition of numbers (assesses the amount of short-term memory); Vocabulary (assesses the ability to understand and understand the meaning of a word); and Verbal Intelligence (assesses the ability to understand and understand the meaning of a word). Non-verbal intelligence is assessed by means of 5 subtests: Cipher (assesses visual perception and kinetic praxis, hand-

The characteristics of the sample (N=20)

Table 1

Gender	Number (N=20)	Age		
male	9	from 21 to 41 years (M=27,1 years)		
female	11	from 19 to 42 years (M=25,5 years)		
Diagnosis				
Autism spectrum disorder (ASD)	3			
Schizotypal disorder	1			
Mild mental retardation	8			
Moderate mental retardation	6			
Severe mental retardation	1			
Epilepsy	1			
Live in				
family	8			
in the training flat (formerly at the PRI)	4			
in a training hostel at the Family Education Support Centre (FESC)	7			
independently (previously in a psycho-neurological boarding school)	1			

eye coordination); Missing Details (assesses attention, object gnosis, ability to detect a significant missing detail); Koos Cubes and Folding Figures (these subtests assess the ability to spatial analysis and synthesis); Sequential Pictures (reflects the ability to establish cause-and-effect relationships). Scoring and assessment of results were carried out according to a standardized procedure.

To determine the degree of independence and the need for help and support, we used the "Questionnaire for assessing the degree of independence of persons with mental disorders and the support they need" developed by M.E. Sisnyova and colleagues [7]. In a semi-structured interview format, the respondent is assessed on a number of functions grouped into 9 sections. In addition, we have added sections containing the interviewer's observations (the respondent's ability to communicate, to maintain attention during the interview, to concentrate in the interview) and the survey of the immediate environment, which covers various areas of the respondent's life, his/her behaviour and reactions, which allows us to obtain a more objective assessment. We will not go into the description of each of these sections in detail, but will give a brief overview:

- General tasks and requirements: questions in this section focus on orienting oneself to one's own personality and environment (e.g. being able to say how old you are or understanding one's own limitations);
- Learning and applying knowledge: questions in this section assess numeracy, writing skills and the ability to solve a simple household problem. Questions can be practical, such as reading a notice, writing down a telephone number or counting a small sum;
- Communication: communication skills are assessed (e.g. expressing a request or need in a clear way), the ability to use electronic means of communication, the ability to follow verbal instructions (e.g. understanding the content of public transport announcements);
- Mobility: this small section assesses the respondent's ability to ask for help when travelling (e.g. when looking for an address);
- Self-care: this section assesses skills such as the ability to seek medical help, to choose clothing according to weather conditions, etc;
- Home life: this section is related to the understanding of domestic functions (shopping for food, the ability to use household appliances, the understanding of safety rules in the home, etc.);
- Interpersonal relations: reflects the ability to interact with other people, including understanding the rules of communication, emotional reactions when communicating;
- Main areas of life: reflects the respondent's ability to manage money, opportunities to study and get educated;

— Community, social and civic life: assesses the respondent's involvement in society (hobbies, leisure activities, membership of any social groups).

Based on the results of the survey, an overall score is calculated which allows the respondent to be placed in one or another group according to their level of independence and ability to work, and to determine the type and level of support required. Five groups have been identified:

- The first group is people who have a sufficient level of autonomy and no need for assistance and support in independent living;
- The second group may include people whose autonomy is slightly reduced (level 1) and who need support "on demand" (type I support);
- the third group includes people whose autonomy is moderately impaired (level 2) and who need "assistive participation" / "supervised accompaniment" (type II accompaniment);
- the fourth group includes people whose degree of autonomy is severely restricted (3rd degree) and who require "guiding participation and cooperative fulfilment" (type III support);
- The fifth group includes people whose autonomy is severely limited (level 4) and whose type of support is "substitute fulfilment and care" (type IV support).

In this article we'd like to describe in more detail the level of cognitive development of those interviewed, and a more detailed analysis of the results of the survey using the Autonomy Questionnaire will be presented in the following publications.

The intelligence study was conducted by a qualified clinical psychologist, who was not previously familiar with the subjects, face-to-face and individually between the end of April and the end of June 2022. A standardised procedure was followed. Mathematical processing was performed using IBM SPSS Statistics (version 21) software. The Mann-Whitney U-criterion was used to compare groups with different levels of autonomy, and the Spearman rank correlation coefficient was used to determine the relationships between verbal intelligence and autonomy indicators.

#### Survey results and their discussion

The results of the test using the Wechsler scale revealed each subject's actual intellectual level (fig. 1).

As shown in the diagram, there were 2 individuals with normative intelligence values (one with a mean value, one with a reduced norm, mean IPR=89). Borderline values of intellectual development are revealed in 2 persons (at the same time unevenness of intellectual achievements is noted, average value of IPR=74,5). These data allow us to note that formal indicators of intellectual level do not fully determine the ability and possibility of independent living. In-

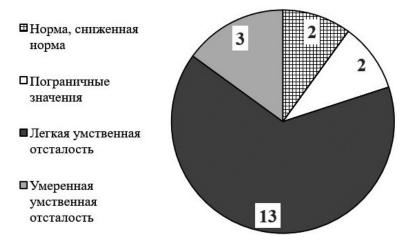


Fig. 1. Distribution of subjects by intelligence level (Wechsler test, general intellectual index — GII) (N=20)

tellectual indicators close to the norm and borderline were found in the study subjects whose main disorders were caused by autism spectrum disorder or schizophrenic spectrum disorder. It has been shown that the deficit of social functions, especially social cognition, which allows understanding and comprehending the mental state of other people, which in turn significantly affects social functioning, is associated with the greatest difficulties in people with these disorders [15].

In a recent study by S. Corbera and colleagues [12] compared groups of young adults with schizophrenic spectrum disorders (N=46, mean age 29 years) and autism spectrum disorders (N=30, mean age 21 years) with healthy subjects (N=51, mean age 26 years). Intelligence level was assessed using the Wechsler test and corresponded to normative values in all subjects (mean values on the Wechsler test: in the group with schizophrenic spectrum disorders 95.6; in the group with RAS 115.9; and in the control group 110.8). The comparison groups showed lower indices of general and cognitive empathy, as well as a high level of personal distress, while no correlations between intelligence indices and the level of social functioning were found.

The remaining 16 subjects were found to have cognitive underdevelopment to the level of mild (N=13, mean IPR=58.7) or moderate (N=3, mean IPR=43.7) mental retardation. In addition, among the subjects with mild mental retardation, 3 persons have a general intelligence index on the borderline with the moderate degree (50-51 points). At the same time, not all the data obtained coincided with the assessment of intellectual development reflected in the diagnosis (for example, the total score of a young woman diagnosed with severe mental retardation in this cut-off corresponded to the indicator of moderate mental retardation). These inconsistencies appeared to be characteristic of individuals living

in social institutions. During the survey procedure, most subjects demonstrated incomplete understanding of the social context of the situation, indicating a general decrease in the level of criticality. This could be expressed in violation of social boundaries during interaction, excessive directness in communication (using the first name, personal questions to the experimenter, spontaneous statements about themselves and their lives). Sometimes the degree of uncritical behaviour in the examination situation was pronounced and was corrected only with external help. For example, one of the subjects, when a mobile phone rang, picked up the receiver and began to talk casually (the call was not related to an emergency situation requiring an immediate response), while another subject was constantly distracted by the table at which she was working (stroking its surface, asking the experimenter various questions about it, seeking to bite, spontaneously speaking about the table while performing tasks). According to observations, the degree of uncriticism was stronger in subjects with lower intelligence indicators, which corresponds to clinical manifestations of mental underdevelopment.

The distribution of the participants by degree of autonomy, based on the results of the 'Survey of the degree of autonomy of people with psychiatric disorders and their need of assistance' [7], was as follows. All subjects show a need for help and support. At the same time, there are none whose level of autonomy suggests the third (III "Guided participation and shared fulfilment") or fourth (IV "Substituted fulfilment and care") types of support. In the study group, 11 people showed minor autonomy difficulties ("on-demand accompaniment", accompaniment type I) and 9 people showed moderate autonomy difficulties ("assertive participation/controlling accompaniment", accompaniment type II). It is interesting to note, however, that adults with

normal intelligence scores (2 individuals) also show a need for external support and accompaniment (one at the level of mild difficulties and the other at the level of moderate difficulties). This again emphasises that formal intelligence scores that are at or close to conventional normative levels do not automatically mean that a person does not need support, but only that other indicators (e.g. social cognition mentioned above) also influence the level of social functioning.

We then constructed average cognitive profiles of individuals indicating levels of autonomy and dependency (Figure 2). Subjects whose intelligence level did not correspond to the normative values (10 and 8 people in each group) were taken into account, as otherwise the average scores on the subtests in the sample would be highly distorted.

Figure 2 shows the average scores on the subtests of the Wechsler scale. The graph shows that, on average, scores on all subtests of verbal intelligence (Awareness, Comprehension, Arithmetic, Similarity, Digit Repetition, Vocabulary) and some subtests of non-verbal intelligence (Missing Details, Sequential Pictures) are lower in subjects who are more in need of support and assistance. These results are expected: the degree of cognitive decline reflects lower scores in abstract thinking and cognitive processes (attention, memory) in general.

The mean scores for the subtests that determine the ability to analyse space (Koos Cube, Folding Figures) are not significantly higher in the group of people with a lower autonomy level. These data, which will need further clarification with the expansion of the sample, may relate to the fact that people with ASD often possess preserved spatial cognition (and in the Wechsler test, higher scores on these subtests are seen against a background of lower scores on other, mostly linguistic, subtests), but that these abilities are of lesser influence on social functioning (as indicated by the degree of independence).

Further comparison of subject groups with different autonomy levels reveals some statistically significant differences (Table 2).

On average, the index of verbal intelligence is significantly lower in the group of less independent people, approaching the indicators of mild intellectual disability; the similar index in the group of highly independent people is in the range of the ceiling of mild intellectual disability. As for the level of nonverbal intelligence, no statistically significant differences were found (the mean values are more or less the same). The general level of awareness, indicators of attention, comprehension and the ability to search for the missing essential detail in the image are higher in persons with more developed autonomy. At the level of tendencies, too, this group shows a greater

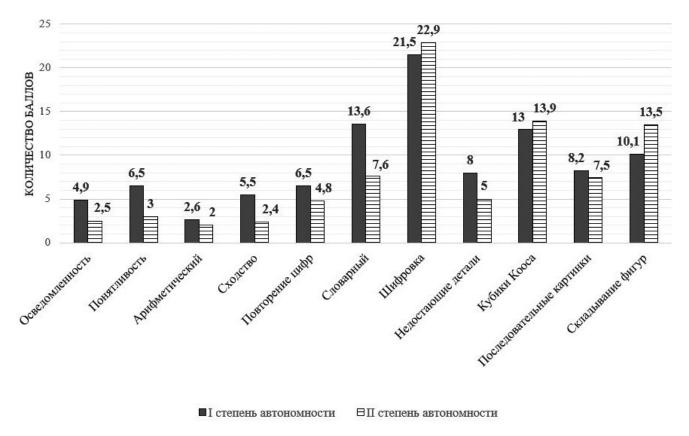


Fig. 2. Two groups differing in the degree of autonomy are compared, on all subscales of the Wechsler test (N=18)

Table 2
Correlation of intellectual abilities with some indicators of autonomy in people with mental disorders (Wechsler Test, Questionnaire to assess autonomy level and support needs of people with mental disorders) (N=18)

Wechsler scale subtests	Grade I (autonomy is slightly impaired) (N=10) M (SD)	Grade II (autonomy is moderately impaired) (N=8) M (SD)	Mann-Whitney U-criterion, p
VIP (verbal intelligence)	62,7 (9,7)	52,5 (7,2)	,026*
NIP (non-verbal intelligence)	64 (6,5)	61 (20)	,229
GIQ (general intelligence)	61,1 (6,1)	54 (12,2)	,119
Awareness	4,9 (4,6)	2,5 (1,2)	,027*
Comprehension	6,5 (3,7)	3 (2,1)	,064t
Similarity	5,5 (3,7)	2,4 (3,5)	,078t
Repetition of numbers	6,5 (1,3)	4,8 (2,3)	,063t
Missing details	8 (2,4)	5 (2,6)	,025*

Note: \* - p<0,05; \* - p<0,1 (at trend level); M - mean value, SD - standard deviation.

volume of short-term memory, more developed practical thinking and the ability to judge on the basis of everyday and social experience (comprehension subtest), as well as a better developed generalisation ability. It is important to note that a decrease in the level of generalisation and specificity of thinking is characteristic of both groups, but some of the subjects in the second group failed to generalise at all. This manifested itself in a misunderstanding of the instructions, highlighting the differences between the proposed concepts instead of looking for similarities (e.g. in the dog/lion pair "A lion sits in a cage, but a dog walks along the road", orange/banana "An orange is round, but a banana is like a crescent"). Generalisation of simple concepts (animals, fruits, instruments) was accessible for a number of subjects, but more complex pairs caused marked difficulties (e.g. north/west, poem/statue).

Almost all subjects had the greatest difficulties in the Arithmetic subtest: as shown in the graph (Fig. 2), the average values are almost identical. While all of them coped with the quantitative counting task (some of them counted using their fingers), their elementary arithmetic operations were limited to the ability to solve a problem with simple conditions for addition or subtraction within 10. As a rule, the participants of the study had difficulties in understanding the conditions of the problem and further searching for a solution, or they referred to the difficulties of counting in the mind.

No statistically significant differences were found between the groups in the Vocabulary subtest. Speaking difficulties are common to all subjects. They are expressed in poor vocabulary, difficulty in making extended inferences and in violating the grammatical structure of speech. In the vocabulary subtest, when a word was familiar to the examinees, they had difficulty in explaining its meaning. When trying to give a definition, they often relied on their own social experience reflecting a specific situation (for example, when explaining the word breakfast, they often listed specific dishes: "When you cook scrambled eggs, sandwich for yourself and eat" or "For example, porridge, sandwiches, tea, this is food and tea is drinking"), but could not identify the main meaning of the word, reflecting the temporal characteristic of the concept, namely the morning meal. Language comprehension is limited to everyday vocabulary and understanding the meaning of simple instructions for the majority of the study group.

Table 3 shows the results of the correlation analysis between intellectual abilities and individual indicators of autonomy (the questionnaire scales for which significant relationships were found are indicated). It should be noted that not all of the questionnaire scales were related to the intelligence indicators, which further indicates the need to assess autonomy not only at the cognitive level. The most important correlations were obtained between the Learning and Applying Knowledge scale and most of the intellectual indicators. Inverse correlations indicate that the higher the score on the Wechsler test, the greater the degree of independence demonstrated by the respondent when completing the questionnaire. As mentioned above, the Learning and Applying Knowledge scale assesses the ability to write, read, do simple arithmetic and solve a simple household task. At the same time, the tasks in the questionnaire are based on specific practical material (e.g. reading and understanding the information on a package, calculating the amount of money mentally or with a calculator, writing a simple note, etc.). Solving these tasks involves various cognitive processes (including attention, memory), so the relationships obtained with almost all Wechsler subtests are clear (relationships found in 8 out of 11 items). It can therefore be concluded that the scores on the

Table 3
Correlation of intellectual abilities with some indicators of autonomy in people with mental disorders (Wechsler Test, Questionnaire to assess autonomy level and support needs of people with mental disorders) (N=20)

Subtests/Scales	Learning and applying knowledge	Mobility	Home life
VIP (verbal intelligence)	-,77**	-,46*	
NIQ (non-verbal intelligence)	-,47*		
GIQ (general intelligence)	-,68**		
Awareness	-,54*	-,50*	-,47*
Comprehension	-,48*	-,47*	
Arithmetic	-,84**		
Similarity	-,63**	-,51*	
Vocabulary	-,58**		
Repetition of numbers	-,77**		
Ciphering	-,52*		
Missing parts	-,78**		

Note: \*\* - p < 0.05 (r-Spearman correlation coefficient); \*\*\* - p < 0.01 (r-Spearman correlation coefficient).

Learning and Applying Knowledge scale are an indirect reflection of the respondent's cognitive ability. The Mobility scale assesses the ability to ask for help in the event of difficulties when travelling (for example, the respondent's answer to the question "What do you do if you can't find the right address?") and, according to our data, is related to the general index of verbal intelligence as well as to the Awareness, Understanding and Similarity subtests. This means that the higher the level of general knowledge and perception of the environment, the higher the ability to draw on everyday practical experience, the higher the ability to work with concepts, to think abstractly, the more clearly the respondent can explain how and to whom to turn for help. The more adaptable and oriented the respondent is in everyday life (the Household Life Scale), the higher his/her scores will be on the Understandability subtest, which, as mentioned above, assesses the ability to make inferences based on everyday and social experience.

According to the observation data, during the course of the study, the majority of respondents were characterised by a general decrease in the pace of mental activity, a rapid increase in fatigue and fatigability, inertia of mental processes under conditions of mental stress, which manifested itself in a decrease in work capacity and efficiency of activity results. This should also be taken into account when carrying out rehabilitation and training activities.

#### **Conclusions**

1. The results obtained give a more accurate picture of how much intellectual disability is present in individuals requiring supported living, training and work. However, intelligence is only one factor in as-

sessing the ability of people with mental disabilities to live independently. A comprehensive assessment should consider developing social cognition, communication, domestic and social skills and should go beyond assessing a formal measure of intellectual development.

2. According to the Wechsler test results, the need for accompaniment, help and support in the group studied is more pronounced among those with lower verbal intelligence indicators than among young people with higher verbal intelligence development.

## Limitations and further perspectives of the study

One of the limitations of the study is the size of the sample, which currently prevents the identification of separate groups according to the nosological classification of the individuals and a number of social characteristics (e.g. experience of living and growing up in a family or in a social service, or level of education).

At this stage, the study is exploratory and reflects the results of the target group studied (namely, GAMP students). In the future, it will be possible to extend the sample with comparison groups: for example, people with intellectual disabilities who are in need of supported accommodation but do not have GAMP training. Or graduates of the FESC who, after reaching the age of 18, have passed the Commission for Independent Living and who have not been transferred to the PRI.

The study opens up the prospect of exploring and identifying specific factors, other than the level of intellectual development, that contribute to growing independence in independent living and acquiring vocational skills.

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