



# Delta Questionnaire – tool adaptation in a group of people with mild intellectual disability and a preliminary analysis of its psychometric properties<sup>1</sup>

<https://doi.org/10.34766/fetr.v55i3.1200>

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**Abstract:** The aim of the presented research was an adaptation of Delta Questionnaire by Radosław Drwal in the group of people with mild intellectual disability and in the group of adolescents within the intellectual norm, as well as a preliminary analysis of its psychometric properties. The tool enables measurement of locus of control understood as a personality dimension (Drwal, 1995). The questionnaire was subjected to psychometric verification in research involving adolescents (178 adolescents with mild intellectual disability and 179 within the intellectual norm). The choice of respondents was arbitrary. The research was carried out in the context of resilience theory. For this reason, the analysis included results obtained from adolescents who have experienced a variety of difficulties in the course of their life. What is more, students with mild intellectual disability diagnosed with a genetic syndrome and adolescents with multiple disabilities were excluded from the study. The first stage of work on the adaptation of the Delta Questionnaire was verification of descriptive statistics and distribution analysis. Then, a reliability analysis of subscales was carried out. For this purpose, due to the dichotomous nature of the answers in the questionnaire, the Kuder-Richardson method was used. The next stage of the research was a confirmatory factor analysis. Finally, the tool was standardized. The obtained results allow us to conclude that the Delta Questionnaire is a tool which enables reliable and accurate measurement of locus of control in a group of adolescents with mild intellectual disability.

**Keywords:** adolescence, intellectual disability, locus of control, tool adaptation

## Introduction

The concept of locus of control has been analysed in psychological research since the beginning of the second half of the 20th century (Filipiak, Łubianka, 2019). It is considered “a significant determinant of behaviour of each person” (Ziółkowska, 2019, p. 142). To be more precise, locus of control is considered a dimension of personality which has a significant effect on an individual’s functioning: taking decisions, social activity, life achievements or aspirations. It is a variable that allows us to explain many relations that can be observed between an individual and behaviour or situation. To properly understand the nature of this concept, it is worth reviewing Julian Rotter’s theory of social learning.

## 1. Locus of control – theoretical aspect

Locus of control has decisive influence on individual’s functioning and beliefs as to what determines the outcomes of undertaken activities (Rotter, 1966, after: Majewicz, 2002). We can define it as “an individual’s generalised expectation regarding the nature of the factors which determine the consequences of one’s behaviour” (Polański, 2018, p. 245).

Following the Theory of Social Learning, there are three groups of factors that shape behaviour. These are: expectancies, reinforcement, and psychological situations (Kościelak, 2010). Expectancies are defined

<sup>1</sup> Article in polish language: Kwestionariusz Delta – adaptacja narzędzia na grupie osób z niepełnosprawnością intelektualną w stopniu lekkim i wstępna analiza właściwości psychometrycznych <https://www.stowarzyszeniefidesetratio.pl/fer/2023-3Woj.pdf>

as: “subjective probability with which a person expects that, in a given situation, her or his behaviour will lead to a particular reinforcer.” (Kościelak, 2010, p. 40). It should be noted that the probability will depend on generalized expectations that have their origin in other sequences and on the reinforcement value. Another group of factors which will influence given behaviours is reinforcements (Kościelak, 2010). These are understood as “everything that results in appearance of an orientation or as a type of behaviour” (Kościelak, 2010, p. 40). It is worth noting that behaviour is a result of several reinforcements, which affect the individual with different strength – because they differ in terms of their value. The last group of factors, in turn, social situations, are necessary to predict human behaviour in a reliable manner. These factors are related to categorization of events that take place in a human life. They allow an individual to perceive and interpret some of them as identical, due to, for example, similarity of their reinforcements (Kościelak, 2010).

According to the Rotter’s Theory of Social Learning, a person can fulfil their needs through instrumental behaviour. Reinforcements that a person receives increase their expectation that in the future particular behaviour will result in similar reinforcement (Rotter, Chance, Phares, 1972). It should be noted that impact of such reinforcement on person’s behaviour will be partially dependant on whether the person interprets it as a result of their own behaviour and activity. Activation and engagement will differ depending on whether the individual considers the situation a result of his actions or fate (Rotter, 1966). Therefore, in line with Rotter’s theory, in order to predict human behaviour, it is essential to know not as much the objective features of a situation as the way in which the situation is perceived and interpreted by the person, and the meaning that the person assigns to it. What is more, it should be noted that casual relationships between reinforcements and behaviours can be placed on a continuum (Drwal, 1995). It is believed that “when a person perceives reinforcement as subsequent to his actions, but not entirely consistent with his actions, then in our culture it is usually perceived as a result of luck, chance, fate, powerful others or unpredictable because of the complexity and magnitude of forces surrounding the person” (Rotter, 1966, after: Drwal,

1995, p. 199-200). Such interpretation is called external locus of control (Drwal, 1995). However, if “a person perceives that results are consistent with his behaviour or his own relatively permanent characteristics, we define it as internal locus of control” (Rotter, 1966, after: Drwal, 1995, p. 200). In summary, individuals with an internal locus of control believe that life situations that they take part in are a consequence of their actions or skills. In turn, people with an external locus of control consider the effects of their activities to be a result of external factors, such as fate or luck (Ziółkowska, 2019).

When we analyse the concept of locus of control, it is important to point out that “it is not only the situations that differ in the degree to which a person perceives that their own behaviour rather than the behaviour of others determines reinforcements – but it is also that people may differ in the degree to which the same event in the same situation is perceived as a function of their characteristics or characteristics of others” (Rotter et al., 1972, after: Drwal, 1995, p. 200). Therefore, it is believed that locus of control is an individual characteristic of a person.

The development of locus of control is influenced by the existence of reinforcements, which depends on several factors: the child-parent relationships, parental attitudes, educational methods, child’s intelligence, sex and age, as well as environmental factors (Kościelak, 2010). This has been confirmed by research aimed to track the development of this variable carried out in a group of children in their early childhood. Mark Stephens has demonstrated there that the development of locus of control is strongly influenced by an individual’s intellectual development and intra-family relations. Moreover, it additionally depends on specific aspects related to mother’s behaviour (protectiveness, warmth) and on good relations between parents and the child (Stephens, 1973, after: Kościelak, 2010). Notably, similar results were obtained by such researchers as Walter Katkovsky, Virginia C. Crandall and Suzanne Good (1967) and Daniel Solomon, Kevin Busse, Robert Parelius (1971).

Locus of control is a variable which can, to some extent, be subject to change. Some researchers maintain that an internal locus of control increases during life, which is related to an individual’s growing

possibilities to exert influence on the environment. Higher stability and accompanying confidence will be conducive to an internal locus of control. Conversely, situations shrouded in uncertainty and belief of lack of influence will contribute to an increased external locus of control (Nowicki, Strickland, 1973). This is well illustrated by analyses conducted in a group of young men placed in a juvenile detention centre. It has been shown that locus of control changed during the men's stay in the centre: at the beginning and at the end they demonstrated a more external locus of control. This can be related to lack of confidence and helplessness caused by the changed life situation (Kościelak, 2010). In summary, we could say that "a shift towards an external locus of control occurs under the conditions of chance, or in life difficulties, while a shift towards an internal locus of control is associated with confidence in effectiveness of one's own actions" (Kościelak, 2010, p. 48). Additionally, when an individual believes it is not possible to change their current life situation or experiences helplessness, it can lead to an increase in external locus of control. Successful life events and confidence in one's influence, on the other hand, may lead to a rise in internal locus of control (Kościelak, 2010).

## **2. Locus of control in the context of adolescents with mild intellectual disability**

Although the period of adolescence is considered by some researchers as a time of transition from the external locus of control to the internal one (Oleszkowicz, 2006), such a situation may not always take place in the group of young people with disabilities. Bearing in mind that the changes taking place in this aspect stem from developmental, situational, and relational factors (Kościelak, 2010; Ziółkowska, 2019), it should be noted that the excessively protective attitude towards children, often manifested by parents/guardians, will be conducive to an external location of control. Moreover, researchers who analyse this issue suggest that differences in locus of control may result from the possibilities of choice, which in case of adolescents with intellectual disa-

bility are limited, and from the resulting feelings of helplessness (Guess, Benson, Siegel-Causey, 1985; Stancliffe, 2001). Therefore, it is currently believed that individuals with mild intellectual disability (compared to peers in the intellectual norm) are significantly more often characterized by an external locus of control. This statement is confirmed by the research conducted in this area, a brief description of which will be presented below.

The opinion that students with intellectual disability manifest an external locus of control more often than their peers within intellectual norm was confirmed in research conducted by Michael Wehmeyer (1993, 1994). Particular attention should be paid to the analyses carried out by this researcher together with Susan Palmer (1997). Research conducted by these authors involved a group of students with intellectual disability, a group of students with learning difficulties and adolescents in the intellectual norm. A total of 431 adolescents took part in the research. The analysis of the results allowed to conclude that students with learning difficulties and students with intellectual disabilities more often manifested an external locus of control compared to their peers within the intellectual norm. It should also be noted that, based on the results obtained, Wehmeyer and Palmer showed that in the case of students within intellectual norm, locus of control shifted towards more internal as they grew older. In the group of students with intellectual disabilities, on the other hand, the pattern was the opposite—older adolescents more often showed an external locus of control than younger students with this disability (Wehmeyer, Palmer, 1997).

Further significant analyses were carried out by Karrie Shogren, James Bovaird, Susan Palmer, Michael Wehmeyer (2010). These studies, similarly to the analyses of Wehmeyer, Palmer (1997), were conducted in a group of students with intellectual disabilities, in a group of adolescents with learning disabilities and among adolescents within the intellectual norm. A total of 564 adolescents participated in the study. The analysis of obtained results confirms conclusions from previous research, which indicated differences in locus of control among students in these groups. For example, it was demonstrated that students with intellectual disability at the age of 8

have a stronger external locus of control than their peers. Additionally, these individuals do not show a tendency to increase or decrease in this variable between the age of 8 and 20 (Shogren, Bovaird, Palmer, Wehmeyer, 2010).

It is also worth mentioning the results of the analyses carried out by Joseph Seyram Agbenyeg and Prosper Deku (2016). The researchers attempted to use a modified version of the locus of control scale in order to check the susceptibility of adolescents with disabilities to physical and/or sexual violence. The research was conducted in special schools in Ghana. One hundred seven students participated in the study (31.8% of adolescents with disability of sight, 37.4% of adolescents with hearing disability and 30,8% of individuals with intellectual disability). The results of the analyses showed that 37.38% of the surveyed students had an external locus of control. In turn, an internal locus of control was found in 62.62% of the adolescents participating in the research (Agbenyega, Deku, 2016). The obtained results are not consistent with the results of studies conducted, among others, by Wehmeyer and Palmer (1997) or Shogren et al. (2010). The visible differences may result from the heterogeneous group of respondents included in the analyses of Agbenyega and Deku (2016). In addition, the place of residence of the surveyed adolescents could have influenced the results.

To sum up, we can conclude that knowledge about locus of control is necessary to understand the social functioning of young people with mild intellectual disability. Therefore, it is necessary to find an accurate and reliable tool to measure this variable.

### 3. Psychometric analysis of Delta questionnaire

Radosław Drwal's Delta questionnaire allows for measurement of locus of control understood as a dimension of personality. It refers to the beliefs of an individual regarding their abilities to control their own fate in daily life situations. The obtained results make it possible to determine whether the surveyed person tends towards external reinforcement control or internal self-control (Drwal, 1995).

The questionnaire consists of 24 statements. The subjects respond to each statement by marking T (true) if they agree with it, or F (false) if they believe that the given statement is false. The results of the questionnaire are expressed in two scales: the locus of control scale (LOC) and the lie scale (LS). High scores on the LOC scale are interpreted as an external locus of control, while high scores on the LS scale indicate the individual's tendency to present themselves in an excessively favourable light. The studies carried out so far allow us to conclude that the Delta questionnaire may be applied for example in experimental studies. However, it should be used with caution for the purposes of individual diagnosis or prognosis (due to the small number of items in the scales and the reliability which does not exceed 0.70) (Drwal, 1995).

The scales of the Delta questionnaire are characterized by good psychometric properties. The reliability of the tool was verified with the use of three methods in different groups. The coefficient of absolute stability test-retest, depending on the length of the intervals between measurements, was: LOC–0.79, LS–0.80; LOC- 0.51- LS- 0.59; LOC- 0.38, LS- 0.52. The inter-half equivalence coefficient—using the Spearman-Bown formula—was based on the correlation between the even and odd half of the scale: LOC–0.68, LS–0.79. In turn, the internal consistency coefficient, calculated based on the Kuder-Richardson formula, was: LOC–0.83, LS–0.60 (Drwal, 1978; Drwal, 1995).

## 4. Psychometric properties of the questionnaire in own research

### 4.1. Method

The aim of the performed analyses was to present the adaptation process of the Delta Questionnaire in a group of adolescents with mild intellectual disability and a group of adolescents in the intellectual norm. First, the descriptive statistics and distribution were verified, as well as the tool's internal reliability in reference to the surveyed group. Subsequently, the confirmatory factor analysis was carried out. The last

stage of the analysis was to standardize the results and prepare the norms. Statistical analyses were carried out with the use of IBM SPSS Statistics 25. Importantly, the research design received a positive opinion of the Research Ethics Commission of Department of Philosophy at the Jagiellonian University in Krakow.

#### 4.2. Respondents

The research involved a group of 357 students (178 students with mild intellectual disability and 179 students within the intellectual norm). Considering the diverse etiology of mild intellectual disability, students with a diagnosis of a genetic syndrome and students with multiple disabilities were excluded from the study. In addition, since the theoretical basis of this research was the concept of resilience, only the results of those respondents who experienced various types of difficulties during their lives were included in the analysis. Under life obstacles and difficulties we should understand for example: growing up in an environment with an increased risk of pathology, divorce or separation of parents/guardians, loss of contact with a significant other or their death, serious illness of one of the parents/guardians or the student himself, disability.

The research involved students between the age of 12 and 19. More specifically, the average age of respondents from the group of adolescents with mild intellectual disability was 16 years old. The youth

with mild intellectual disability attended special school complexes (45.5%) and special educational centres (54.5%) in the Małopolska province. In turn, young people within the intellectual standard attended primary schools (23.5%), general secondary schools (48.6%) and technical secondary schools (27.9%), also in the Małopolska province. In the group of students with mild intellectual disability, 52.2% of the respondents were men. The group of adolescents within the intellectual norm included 54.2% of men.

#### 4.3. Results

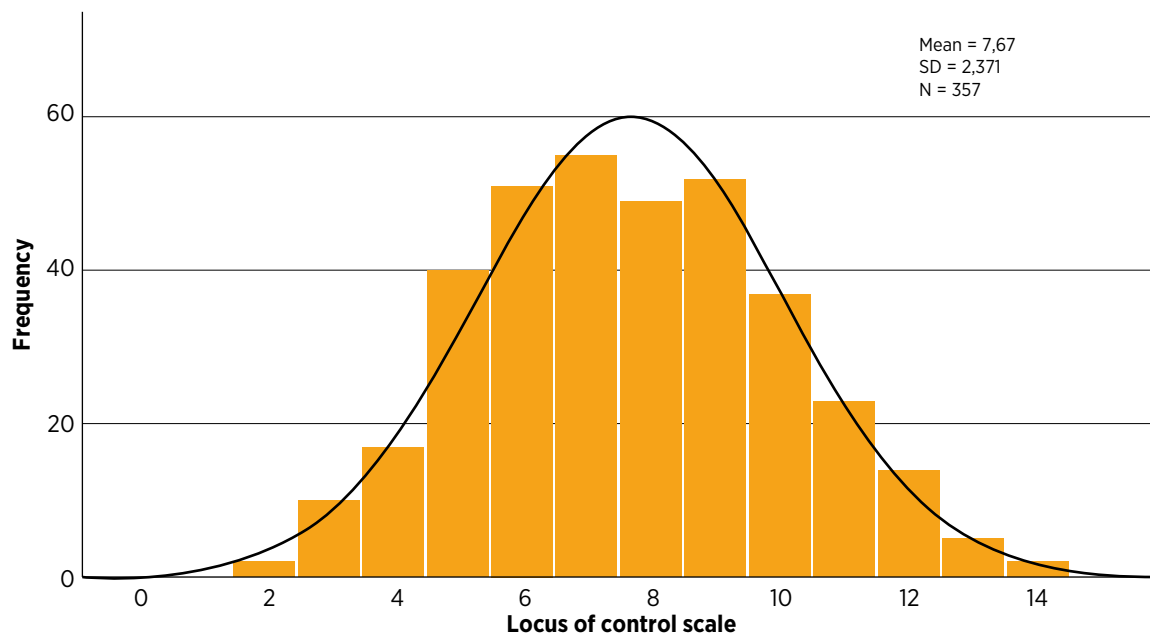
The Delta Questionnaire by Drwal consists of 24 statements with a two-dimensional answer structure (true/false). The structure of the tool is divided into two scales: the locus of control scale (LOC) and the lie scale (LS) (Drwal, 1995). In the first step, the descriptive characteristics and distribution of the results obtained by the respondents were verified. The detailed data are provided in Table 1 and Figures 1 and 2.

The result of the Kolmogorow-Smirnow test turned out to be statistically significant, which means that the distribution deviated significantly from the normal distribution. However, it should be noted that the skewness of the distribution did not exceed the conventional absolute value of 1, which means that the distribution was asymmetric to a slight extent.

Table 1. Descriptive statistics with Kolmogorow-Smirnow test for the Delta Questionnaire for the whole group and divided into groups of adolescents in the intellectual norm and with mild intellectual disability

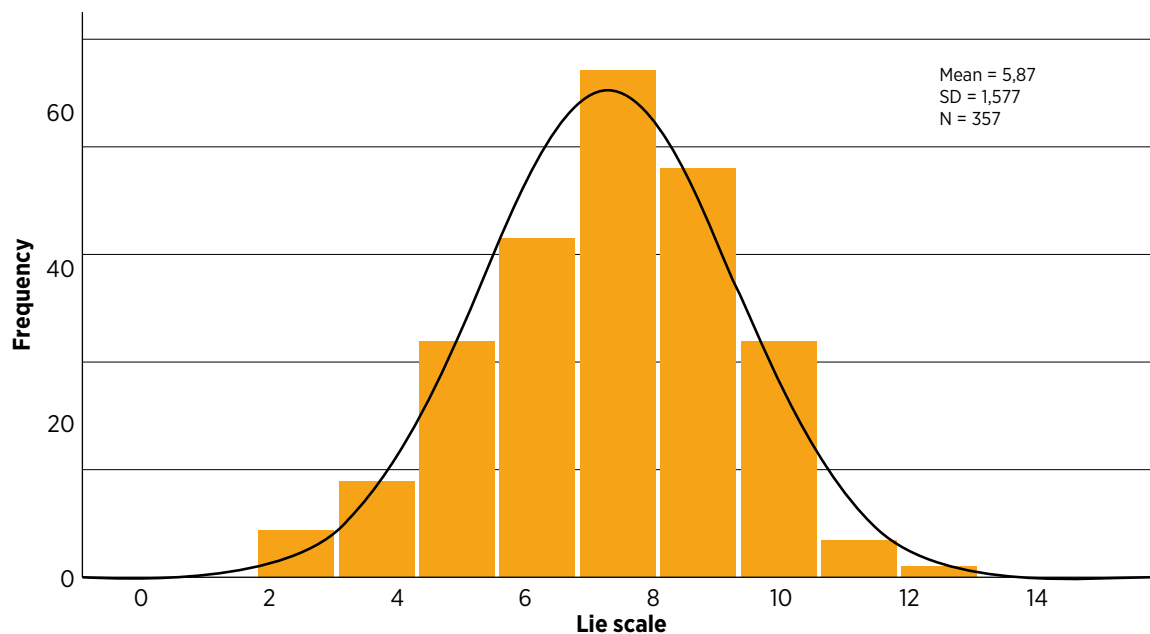
		<i>n</i>	<i>M</i>	<i>Me</i>	<i>SD</i>	<i>Sk.</i>	<i>Kurt.</i>	<i>Min.</i>	<i>Max.</i>	<i>D</i>	<i>p</i>
Adolescents with mild intellectual disability	Locus of control scale	178	8.77	9	2.18	-0.07	-0.39	3	14	0.11	0,000
	Lie scale	178	5.77	6	1.65	-0.09	-0.42	2	10	0.14	0,000
Adolescents within the intellectual norm	Locus of control scale	179	6.57	6	2.01	0.23	-0.12	2	12	0.11	0,000
	Lie scale	179	5.96	6	1.50	-0.47	0.15	2	9	0.19	0,000
Whole group	Locus of control scale	357	7.67	8	2.37	0.13	-0.44	2	14	0.10	<0,001
	Lie scale	357	5.87	6	1.58	-0.27	-0.21	2	10	0.16	<0,001

Source: own elaboration.



Source: own elaboration.

Figure 1. Distribution of results for the whole group for the locus of control scale for the Delta Questionnaire.



Source: own elaboration.

Figure 2. Distribution of results for the whole group for the lie scale for the Delta Questionnaire.

Table 2. Standardization of the Delta Questionnaire in a group of adolescents in the intellectual norm and with mild intellectual disability

Adolescents with intellectual disability (n = 178)		Adolescents in intellectual norm (n = 179)		Sten	
Locus of control scale	Lie scale	Locus of control scale	Lie scale		
<4	<2			1	Very low
5	3	1	0	2	
6	4	2	2	3	Low
7		3	3	4	
8	5	4	4-5	5	
9	6	5	6	6	Average
10	7	6	7	7	
11-12	8	7	8	8	
13	9	8	9	9	High
14	10	9-11		10	Very high

Source: Own elaboration.

#### 4.3.1. Reliability analysis of the Delta Questionnaire

Due to the dichotomous nature of the answers in the questionnaire, the analysis of the reliability of individual scales in the group was carried out using the Kuder-Richardson method (KR-20) and amounted to 0.87 for the locus of control scale and 0.74 for the lie scale. Based on these results, both scales should be considered reliable.

#### 4.3.2. Confirmatory factor analysis of the Delta Questionnaire

The CFA carried out in all observations  $n = 357$  demonstrated a very good fit of the model  $RMSEA = 0.03$ ,  $CFI = 1$ . The above analyses showed that the tool can be considered reliable and reflects the analysed concept at an adequate level.

#### 4.3.3. Standardization of the Delta Questionnaire

The Delta Questionnaire was prepared by Drwal for scientific purposes and group assessment. The original version was not standardized (Drwal, 1995). In this study, it was decided to convert the raw scores into the

sten scale, separately for adolescents in the intellectual norm and adolescents with mild intellectual disability. The sten scale was chosen as the most adequate, considering the low range of raw scores (min. = 2, max. = 14). The results are presented in Table 2.

## Conclusions

Since “locus of control is an important determinant of behaviour of every person, including those who experience disability” (Ziółkowska, 2019, p. 142), it is important to identify accurate and reliable tools for measuring it. One of them is the Delta Questionnaire by Radosław Drwal. This tool allows us to study locus of control, understood as a dimension of personality. In this approach, it is associated with a person’s beliefs about the possibility of controlling their fate during everyday life situations. Specifically, the obtained results allow to determine whether the respondent tends towards external reinforcement control or internal self-control (Drwal, 1995).

The psychometric verification of the Delta Questionnaire and the preliminary analysis of its psychometric properties were carried out in a group of people with mild intellectual disability and adolescents in the intellectual norm. In total, 357 respondents fulfilling

the criteria described in the article took part in the research. The first stage of the study was verification of descriptive statistics and distribution of results obtained from adolescents. In the next stage, a reliability analysis of particular scales and confirmatory

factor analysis were conducted. Finally, the tool was standardized. After conducting statistical analyses, it can be concluded that, due to its satisfactory psychometric properties, Drwal's Questionnaire can be successfully used in the indicated groups of people.

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