A measurement of self-determination for people with intellectual disability: Description of the AUTODDIS Scale and evidences of reliability and external validity

Background. Appropriate supports and instructional practices contribute to the development of self-determination. Also, research shows that the promotion of skills related to self-determination has been linked to the achievement of desired outcomes over the different life stages. Advances in self-determination require the development of assessment instruments because there is a reciprocal relationship between assessment and instruction. The purpose of this paper is to provide a description of the AUTODDIS Scale, along with evidence of its reliability and external validity. Method. A sample of 541 people with intellectual disabilities aged from 11 to 40 was used to validate the scale. Results. The reliability results indicate that the AUTODDIS Scale shows high internal consistency. The total score and subscale scores indicate moderate inter-rater reliability. The scores were also moderately to highly associated with other related measures of self-determination and quality of life. Conclusion. Our results demonstrate that consistent and valid information can be obtained from the AUTODDIS Scale.

Keywords: self-determination; intellectual disability; young people; adults; assessment; reliability; validity

Introduction

Attempts to understand and operationalize the construct of self-determination at an international level date back many years (Abery and Stancliffe 2003a, 2003b; Field and Hoffman 1994; Wehmeyer1999). The most recent theoretical framework for understanding self-determination is Causal Agency Theory (Shogren *et al.* 2015). This model—developed from the functional model of self-determination (Wehmeyer 1999), as well as from more recent contributions from positive psychology and the socioecological conception of disability—understands self-determination as a dispositional characteristic that implies acting as the causal agent in one's life.

Causal Agency Theory (Shogren *et al*. 2015) describes three essential characteristics of self-determined actions (volitional action; agentic action; and action-control beliefs) and seven associated component constructs. Volitional action involves intentional and conscious decision-making based on personal preferences, and includes the component constructs of self-initiation and autonomy. Agentic actions imply adjusting one's own actions by directing them toward the achievement of goals and overcoming obstacles as they occur, and comprise the component constructs of self-direction, self-regulation and pathways thinking. Finally, action-control beliefs refer to recognizing one's own abilities and beliefs needed to reach goals, involving control-expectancies and acting with self-realization and empowerment.

This theory holds that these characteristics can be developed over the different life stages, particularly during adolescence, by providing the necessary supports and interventions to promote the component constructs (Shogren *et al.* 2018). Furthermore, there is a sufficient body of research linking the promotion of self-determination to the achievement of desired outcomes during the school years (Palmer *et al.* 2012; Shogren, Palmer *et al*. 2012; Wehmeyer *et al*. 2011) and in the transition to adulthood (Martorell *et al.* 2008; Shogren *et al.* 2015); as well as to enhanced quality of life (McDougall *et al.* 2010; Lachapelle *et al*. 2005; Pascual-García *et al.* 2014; Wehmeyer and Schalock 2001).

In this context, implementing and evaluating the effectiveness of practices to promote self-determination requires appropriate tools (Shogren, Shaw *et al.* 2018; Wehmeyer 2001) focused on both adolescence and adult life. Assessing self-determination is a complex process that should include a combination of standardized and informal procedures, incorporating information from multiple sources, involving the individuals concerned, their families, and professionals who know them well

(Wehmeyer 2001). The persons with disabilities should be at the center of the process (Field *et al.*1998) and the assessment itself should serve to enhance reflection, self-awareness, self-evaluation, and ultimately, self-determination. In other words, it should be based on an 'empowerment evaluation' (Fetterman 1996; Wehmeyer 2001).

Most of the instruments developed to date are self-reports designed for use by adolescents (Abery and Stancliffe 1995a, 1995b; Hoffman *et al.* 2015; Wehmeyer and Kelchner 1995; Wolman *et al.*1994). The Arc's Self-Determination Scale (Wehmeyer and Kelchner 1995) is one of the most internationally recognized and widely used scales for adolescents with intellectual disabilities. In Spain, this scale has been translated (Wehmeyer *et al.*2006) and has also served as the basis for the development of another instrument that has demonstrated adequate psychometric properties (The ARC-INICO Scale; Verdugo, Vicente, Fernández-Pulido *et al*. 2015; Verdugo, Vicente, Gómez *et al*. 2015). There have been recent initiatives to develop new tools that are aligned with the current theoretical model (Shogren, Wehmeyer, Palmer *et al*. 2015) and that enable the assessment of adolescents with and without disabilities. One such tool is the Self-Determination Inventory System (Shogren, Little *et al*. 2018; Shogren, Wehmeyer, Little *et al*. 2015), as well as its translation and adaptation into Spanish (Mumbardó-Adam *et al.* 2018).

Despite the wide range of instruments available (albeit some already obsolete), in reality the vast majority are limited to the assessment of self-determination during the school years and are in self-report format. While there is no doubt about the importance of self-determination during these years, nor about the relevance of self-report measures as a way to place the person at the center of the assessment, an appropriate evaluation should use various methods and include professionals and relatives as a source of information, allowing the comparison of results (Field *et al.* 1998).

There is still a need to develop new assessment tools to address existing gaps. On the one hand, there is a lack of tools to assess self-determination in other age ranges beyond adolescence (i.e., from childhood through to early adulthood or even later). Many studies aimed at promoting self-determination in the adult people find it necessary to use other types of non-specific assessment instruments (e.g., quality of life scales: Martorell *et al.* 2008; Pascual-García *et al.* 2012) due to the lack of instruments for this stage. On the other hand, there is a need to standardize third-party assessment instruments, enhancing the range of tools available for comprehensive and comparable evaluations. Furthermore, given that self-report measures are not a suitable option for

many people with disabilities (Shogren, Little *et al.* 2018), scales based on information provided by others are a good alternative.

The AUTODDIS Scale (Author *et al.* 2021) was developed in response to this need. A research project was carried out to develop and validate a new scale to assess the self-determination of people with intellectual disabilities aged 11 to 40 (using third-party information). The aim of the AUTODDIS Scale is not to diagnose or classify people with intellectual disabilities but to identify the strengths and weaknesses in self-determination focused on promoting interventions to improve their self-determination development and opportunities (i.e., an assessment to support planning; Schalock *et al*. 2010). Given the reciprocal relationship between assessment and instruction, valid and reliable measures of self-determination are needed to effectively evaluate the impact of interventions to promote self-determination (Shogren, Shaw *et al*. 2018; Wehmeyer 2001).

The AUTODDIS Scale is a multidimensional self-determination instrument composed of different subscales to be completed by an external observer who knows the person with intellectual disability well (e.g., professionals or family members). The final version of the scale consists of 46 items—written in the third person—that assess six subdomains of self-determination according to the theoretical model proposed by Shogren *et al.* (2015). The scale was developed over three stages, taking into account the steps proposed for the objective development of a test (Muñiz and Fonseca-Pedrero, 2019). First phase: scale elaboration and construction of the items. The first pool of items was developed using the results of a Delphi study, in which agreement was reached on a comprehensive pool of 115 items with adequate evidence of content validity based on consensus across stakeholders (Author *et al.* 2019). Second phase: scale edition and pilot study. The wide pool of items was reduced to create the first field-test version of the scale, composed of 88 items and a pilot study was conducted to provide preliminary evidence of reliability and validity (Author *et al*. 2019). Third phase: application and validation of the scale. This phase of development and validation of the scale involves several data analysis procedures, with the aim of guaranteeing the solidity of the final version. First, the scale was tested with a wide sample in order to provide evidence about the dimensional structure of a 46-item scale, distributed across six domains, through an Exploratory Structural Equation Modeling —ESEM— approach and measurement invariance across age and gender was established (Author *et al.* 2020). Within this phase, the main goal of this paper is to provide evidences of

reliability and external validity related to other variables that support and complete the validation of the AUTODDIS Scale.

Method

Participants

A total of 181 professionals acted as informants for the assessment of541 people with intellectual disabilities between the ages of 11 and 40 years Most professionals were women (75.1%); and their profiles were diverse: teachers (21%), carers (20.4%), psychologists (9.9%), occupational therapists (3.9%), directors of centers or services (2.8%), speech therapists (2.8%), social workers (2.8%), and educators (2.8%). Complementary information was also gathered from 106 family members, who acted as second respondents, which meant that 19.6% of the sample was double assessed. The majority were women (71.7%), and 56.6% of the total were the mothers of the participants with disabilities. The other assessors included fathers (22.6%), another family member (7.5% brothers/sisters; 3.8% aunts/uncles), and legal guardians or persons with another type of relationship (9.5%).

All informants had to meet some criteria to guarantee that they had enough knowledge of the assessed person to serve as their informant: (1) know them for at least four months (M = 64 months; SD = 57.15); and (2) have frequent contact (at least once a month) and opportunities to observe them in different situations nowadays (74.8% saw the assessed person daily or several times a week).

Regarding people with intellectual disability assessed (n =541), most were men (n = 334; 61.7%); between the ages of 11 and 40 years (M = 26.28; SD = 8.28); and distribution by gender and age was not homogeneous ($\chi^2_{(30)}$ = 47.23, $p < .05$).

In addition to filling in the AUTODDIS Scale, informants were asked to estimate participants' level of intellectual disability, based not only on their intellectual functioning (classical perspective) but also on their adaptive behavior (current supports paradigm; Schalock *et al.* 2021; Schalock *et al*. 2010). Most were identified as having a mild or moderate disability (Table 1). Further, when asked about associated conditions and possible specific etiologies, informants reported behavioral problems in 25.9% of participants (n = 140); communication difficulties in 18.1% (n = 98); mobility impairments in 16.3% (n = 88); epilepsy in 14% (n = 76); autism spectrum disorder in 8.7% (n = 47); cerebral palsy in 6.9% (n = 32); visual impairments in 3.7% (n = 20) and

hearing impairments in 2.4% (n = 13). It should also be noted that for 12.2% of the sample (n = 66), the intellectual disability was associated with Down syndrome.

Table 1

Instruments

Self-determination

The AUTODDIS Scale (Author *et al*. 2020) is designed to assess the self-determination of adolescents and adults with intellectual disability between the ages of 11 and 40. This wide age range expands research regarding available scales for early adulthood—a critical transitional life stage during which self-determination is essential. Tests of configural, strong and strict invariance were executed between young people (11-21) and adults (21-40). Results have confirmed that the factor structure, factor loading magnitudes and item residual variances were equivalent between groups (see Author *et al.* 2020). Different factorial models (i.e., correlational, hierarchical, bifactorial and exploratory structural equation models) were tested and good evidence of validity based on the internal structure were also showed in the same article. Previously, in the pilot study, the scale showed preliminary results indicating good reliability (with Cronbach's alphas near or above .95; Author *et al.* 2019).

The scale is composed of six subscales, which can be categorized into three domains of self-determination according to the most recent theoretical model (Shogren, Wehmeyer, Palmer *et al.* 2015). The first domain, *volitional characteristics (autonomous and volitional actions)*, is made up of two subscales: *autonomy* (7 items) and *self-initiation* (6 items). The second domain, *agentic characteristics (self-managed actions)*, includes the subscales of *self-direction* (12 items) and *self-regulation* (3 items). Finally, the *action-control beliefs* domain is structured around two subscales: *self-realization* (6 items) and *empowerment* (12 items). The response format for all items is a four-point Likert scale based on level of agreement (i.e., strongly disagree, disagree, agree, and strongly agree).

In order to provide evidence of convergent validity, prior to the administration of the AUTODDIS Scale, informants were asked via four items to estimate participants' level of self-determination. The first was an item to estimate the global level of self-

determination of the person being assessed. Informants were presented with five statements numbered 1 to 5 and were asked to choose the most appropriate (1 = The person has little or no control over his/her life, rarely acts as the causal agent in his/her life; 2 = The person has some control over his/her life, acts as the causal agent in some facets of his/her life; 3 = The person has moderate control over his/her life, acts as a causal agent in many facets of his/her life; 4 = The person has considerable control over his/her life, acts as the causal agent in most facets of his/her life; 5 = The person has total control over his/her life, acts as the causal agent in all facets of his/her life). For the three remaining items, informants were asked to estimate the person's level in each of the three essential characteristics of self-determination (volitional action, agentic action, and action-control beliefs). They were provided with a description from the theoretical model (Shogren, Wehmeyer, Palmer *et al.* 2015) and asked to give an estimate for the person on a scale of 1 to 5 (where 1= low; 2 = moderately low; 3= medium; 4 = moderately high; 5 = high).

Quality of life

Informants were also asked to provide information on participants' quality of life based on previously conducted assessments that were readily available at their centers. For that reason, a wide number of different scales were reported. They were asked to report standard scores for the quality of life domains along with the global quality of life index (i.e., total standardized score).

The INICO-FEAPS Scale (Gómez *et al*. 2014; Verdugo *et al.* 2013) was the most frequently reported tool (n = 67 for the self-report version; and n = 94 for the report by others version); the San Martin Scale (Verdugo *et al.* 2014) was reported for 48 participants; the INTEGRAL Scale (Verdugo, Gómez *et al.* 2010) for 45 participants; the GENCAT Scale (Verdugo, Arias *et al.* 2010) for 26; and the KidsLife Scale (Gómez *et al.* 2016) was reported for nine participants. All are scales with suitable evidences of reliability and validity in Spanish intellectual disabilities population.

The INICO-FEAPS Scale (as more reported scale) was therefore used to provide validity evidences based on the relationship of self-determination with other related constructs. Research endorses the relations between self-determination and quality of life (Lachapelle *et al.* 2005; McDougall *et al*. 2010; Wehmeyer and Schalock 2001; White *et al.* 2018). According to Wehmeyer and Schalock (2001) the theoretical frameworks of both *"rely on or reference each construct as a means of defining the*

other" (p. 7). This scale includes a report by others version, comprising 72 items that provide a standard score for each of the domains according to the Schalock and Verdugo model (2002): social inclusion, rights, self-determination, emotional wellbeing, physical wellbeing, material wellbeing, personal development, and interpersonal relationships. A global index of quality of life is also provided. Data reported with this version were the most appropriate considering that third-party information is used, as the AUTODDIS scale.

Procedure

The sample was selected through the voluntary participation of 33 organizations that work with people with intellectual disabilities, covering most of the regions of Spain (11 of the country's 17 autonomous communities). Previously, a thorough search of organizations was performed, and an email sent to all potential centers explaining the aims of this research and asking them to participate. The study was also disseminated through the Institute of Community Integration (INICO) website, social networks (e.g. Twitter and Facebook), and scientific conferences and meetings. Thus, some participating organizations showed interest in the project after receiving the informative email; and others contacted the research team directly after learning about the project through other means.

Each organization was responsible for identifying potential people to be assessed, then informing them and their families, and subsequently collecting the informed consents needed for the assessments. To satisfy the selection criteria, potential people had to: (a) have an intellectual disability and (b) be aged between 11 and 40 years. Similarly, the organizations were responsible for identifying from within their centers professionals who would act as informants, completing the assessment on each person's behalf. They were also asked, as far as possible, to recruit relatives of the people with intellectual disabilities as second informants. Given that the AUTODDIS Scale is a third-party scale, selection criteria were established to be able to be selected as an informant. They should be completed by at least one informant (professional or relative) who: (a) knows the person well (minimum of 4 months), (b) have frequent contact with the person being assessed and (c)be familiar with the constructs of self-determination or commit to reading the scale instructions in which the concept and underlying theoretical model were defined.

The study received ethical approval from the Research Ethics Committee of the Community of Aragón (CEICA), and it complied with the principles for the development of research as set out in the Declaration of Helsinki. Participating organizations and the research team ensured that informed consents were collected for all participants, who voluntarily agreed to take part in the research. At no point did the study collect the names of the people being assessed; instead, identification codes were used to ensure confidentiality and anonymity.

Data analysis

The data were refined and processed with the statistics package SPSS 25.0. Cronbach's αand McDonald's ω were calculated to estimate the reliability of the scale in terms of internal consistency. The inter-rater reliability of the subscale scores and the total score of the AUTODDIS Scale was analyzed using the intra-class correlation coefficient (ICC) statistic and inter-rater correlations. The ICC was employed to examine the degree of agreement between evaluations provided by the two raters (professional and relative) on the same participant. The 95% confidence interval was calculated for each ICC and Spearman's correlation to take sampling variation into account. Additionally, Chi squared ($\chi 2$) tests were carried out to contrast if there were significant differences amongst families and professionals' perspectives on self-determination measurement. Evidences of external validity were obtained by relating the scores in the AUTODDIS Scale with other instruments that hypothetically measure the same construct and other related constructs (Elousa 2003), as detailed in instrument section. It was explored by comparing the self-determination estimation items and the INICO-FEAPS Scale scores to the results of the AUTODDIS Scale using Spearman's correlations.

Results

Descriptive analysis

Table 2 shows the descriptive statistics and Spearman's correlations among subscale scores. Although the values of the scores at the descriptive level showed a distribution far from normality, the Kolmogorov-Smirnov test was carried out, confirming that the scores were not normally distributed ($p < .05$).

Table 2

Internal consistency

To estimate the reliability of the scale in terms of internal consistency, Cronbach's αand McDonald's ω were calculated for the data obtained by professionals (n = 541) and also for relatives (n = 106). Cronbach's αis reported, as this has traditionally been the most widely used to assess the reliability of assessment instruments in social sciences. McDonald's ω has also been included because it provides the greatest reliability estimate (Revelle and Zinbarg 2009). As Table 3 shows, all coefficients indicated excellent internal consistency in both applications, above .970 for the global scale, and ranging from .844 and .963 for the domains and subscales. All the subscales obtained good reliability indices, regardless of the informant, with the self-initiation subscale showing the highest level of internal consistency, and the self-regulation subscale the lowest.

Table 3

Inter-rater reliability

As mentioned, 106 participants had a double assessment, completed by different raters (i.e., a professional and a relative). The inter-rater reliability of the items, the domain and subscale scores, and the total score of the AUTODDIS Scale were analyzed through ICC and the inter-rater correlations. The results showed moderate item-to-item correlations ranging from .267 to .594 for all, except seven items. Table 4 presents the ICC and inter-rater correlations for domain and subscale scores, indicating medium-high convergence between the scores of professionals and relatives. The ICC for the total score was .832, indicating adequate inter-rater reliability. No significant differences were found amongst families and professionals measures.

Table 4

Relationship with conceptually related constructs

To evaluate validity in relation to other measures (i.e., self-determination estimation items and quality of life INICO-FEAPS Scale), Spearman's correlation coefficients were calculated. The correlations support the relation of the self-determination estimation items with the AUTODDIS subscales. The estimation items were moderately to highly correlated to the subscale scores (from .600 to 766) and were always in the expected direction (Table 5).

Table 5

The correlations also support the relationship among the INICO-FEAPS Scale and the AUTODDIS subscales. As shown in Table 6, the self-determination scores of the INICO-FEAPS Scale had high correlations with all the AUTODDIS subscale scores (from. 412 to .637). Moderate correlations were also obtained among all the AUTODDIS subscales and the INICO-FEAPS scores in personal development and rights (from .305 to.488). The total score of the AUTODDIS Scale was closely associated with the self-determination score of the INICO-FEAPS Scale (*rho*= .556).

Table 6

Discussion

This article provides a description of the final version of the AUTODDIS Scale (its development process, purpose, structure, and administration), and in addition provides evidence to support its reliability and validity, building on previous findings obtained for the scale (Author *et al.* 2019; Author *et al*. 2019; Author *et al*. 2020). Reliability results indicate that the AUTODDIS Scale and its subscales show high internal consistency. Similarly, the scores of the scale showed adequate inter-rater reliability (i.e., there was a relationship between the assessments completed by professionals and family members). Relations with other measures of self-determination and with related constructs such as quality of life (Lachapelle *et al.* 2005; McDougall *et al*. 2010; Wehmeyer and Schalock 2001; White *et al.* 2018) would support the AUTODDIS Scale as a means to assess self-determination and its essential components. Results show that

there is a relationship between the global quality of life scale and all the AUTODDIS subscales, and also reveal high correlations between these subscales and the self-determination, rights, and personal development domains of the quality of life model (which are the most closely related domains); in contrast, they also indicate very low and non-significant correlations with the physical wellbeing domain. These results are in line with previous studies, which found an overall relationship between the concepts of self-determination and quality of life (Chao 2018; Wehmeyer and Schalock 2001; White *et al.* 2018), as well as evidence that the level of self-determination is a specific predictor of certain quality of life domains, such as personal development and personal fulfillment (McDougall *et al.* 2010).

In short, the AUTODDIS Scale can be regarded as a tool that provides reliable and valid information on the general level of self-determination and its component constructs (see Spanish version in https://sid-inico.usal.es/documentacion/escala-autoddisto download the final version of the scale). Using third-party information, it is a way to assess people with intellectual disability between the ages of 11 and 40 years in order to identify their needs or priorities for action with regard to self-determination. With sound psychometric properties, it is a useful scale for assessing self-determination at the micro, meso and macro levels. At the micro and meso levels, the information obtained can then be used to measure and enhance the impact of personalized support plans and implemented systems at the organizational level, thus further promoting self-determination (Shogren, Shaw*et al.* 2018; Wehmeyer 2001). Similarly, at the macro level, it adds to the suite of specific instruments that foster scientific research, stimulating the design of evidence-based practices, since evaluation requires evidence (Schalock 2018). Along these lines, the current Quality of Life Supports Paradigm (Gómez *et al.* 2021; Verdugo *et al*. 2021) provides a solid theoretical and professional framework for supports provision, person-centered evaluation of results, and to enhance organizations transformation and systems change. This new paradigm emphasizes the importance of providing supports within inclusive community settings and outcome-focused assessments; therefore, it is necessary to design and use specific and rigorous assessment tools, as the AUTODDIS scale, to guarantee personal support plans that improve all quality of life domains.

However, more extensive research and complex analyses (e.g., regression models) are needed to provide further evidence and to ensure the scale is effective for

estimating the impact of practices aimed at promoting self-determination. Although professionals recognize the importance of the self-determination construct (Vaucher *et al.* 2019; Vicente *et al.* 2020), there are still some barriers to its promotion (Mumbardo-Adam *et al.* 2020) and research should continue to develop new assessment and instructional tools and align professional practices with current theoretical framework. Also, specific studies are required to assess and promote self-determination of people with other disabilities or neurodevelopmental disorder (e.g. autism spectrum disorder) using specific instruments of self-determination (Morán *et al*. 2019), including assessment and promotion contextual opportunities for acting in a self-determined manner (Mumbardó *et al.* 2018). Furthermore, when interpreting the results and implications of the scale, there are a number of limitations to consider. First, there are limitations related to the sample. The fact that a convenience sample was used makes it difficult to generalize the results, as does the fact that there was inadequate representation of the different levels of intellectual disability or of other developmental disabilities or associated conditions (e.g., autism spectrum disorder, cerebral palsy). It would therefore be helpful to increase the size and improve the representativeness of the sample to better demonstrate the reliability and validity of the scale in population subgroups that account for possible associated conditions; and also to include people without disabilities, as has been done with other self-determination assessment instruments (Mumbardó *et al.* 2018; Shogren, Little *et al.* 2018). It would also be necessary to expand the research considering control variables such as intellectual disability level or other external factors, as some studies, including one carried out by Authors *et al*. (2020), have showed that contextual opportunities have a mediator role in the classic relationship between ID level and self-determination. Similarly, not having two informants (professional and family member) for all our assessments constituted another sample-related limitation and more research would be needed considering a deeper analysis of their disprepacnies. Second, the lack of tradition in the use of self-determination scales did not allow us to use other self-determination results as comparators to analyze the external validity and we were enforced to use global QOL measures as indicators. Besides, these QoL evaluations were not consistent as the organizations had administered different QoL scales and some of our assessed people did not even have any QoL data available. Finally, the scale was designed for third-party information. While this format is responding to a need, since there are no standardized tools of this kind, it nonetheless implies a limitation that should be

resolved in future research, through the development of a parallel self-report version and the study of the relationship between this scale and other available self-report measures.

While further research is necessary, the results presented in this article together with the ones obtained in previous studies (Author *et al.* 2020) suggest that the AUTODDIS Scale has considerable potential in the professional field as a guide for actions aimed at promoting self-determined behavior. There is no doubt that this instrument is responding to current demand for standardized self-determination assessment tools that are available in the Spanish language, that are aligned with the most recent theoretical concepts, and that widen the pool of available instruments to perform comprehensive assessments (Field *et al.* 1998; Verdugo *et al.* 2013; Wehmeyer 2001). In other words, the AUTODDIS Scale expands the range of available tools that meet the following minimum requirements: (a) include standardized tools alongside more informal instruments; (b) place the person at the center of the process; (c) gather information from different sources; and (d) incorporate the assessment into the intervention process, as the starting point for the promotion of self-awareness and reflection on the part of all stakeholders.

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Table 1. Participants with ID based on intellectual functioning and Adaptive Behavior

Estimation based on intellectual functioning	***Estimation based on adaptive behavior***					
	Mild	***Moderate***	***Severe***	***Profound***	***Total***	***no data***
Mild	161	32	1	0	194	
Moderate	19	161	16	0	196	
Severe	0	12	56	2	70	
Profound	0	0	4	19	23	
Total	180	205	77	21	483	58

Table 2. Descriptive statistics and Spearman's correlations.

	AUT	SIN	SDI	SRE	REA	EMP	AV	AA	CC
SIN	.764								
SDI	.726	.745							
SRE	.618	.590	.725						
REA	.639	.672	.741	.628					
EMP	.639	.740	.824	.685	.748				
AV	.958	.908	.772	.636	.684	.753			
AA	.737	.742	.986	.816	.749	.833	.777		
CC	.710	.755	.841	.701	.855	.979	.769	.850	
i	7	6	12	3	6	12	13	15	18
n	541	541	541	541	541	541	541	541	541
M	18.34	16.40	25.86	6.74	15.81	29.77	34.74	32.59	45.60
SD	5.56	4.29	8.34	2.06	3.69	8.45	9.39	10.01	11.61
Min	7	6	12	3	6	12	13	15	18
Max	28	24	48	12	24	48	52	60	72
Sk	-.458	-.488	-.054	-.118	-.622	-.540	-.543	-.087	-.600
Ku	-.460	.045	-.432	-.417	.747	-.168	-.118	-.361	.114

Note: AUT = autonomy score; SIN = self-initiation score; SDI =self-direction score; SRE = self-regulation score; REA = self-realization score; EMP = empowerment score; AV = Volitional Action Domain; AA = Agentic Action Domain; CC = Action-Control Beliefs Domain; i = number of items; n = sample; M = mean; SD = Standard Deviation; Min = minimum score; Max = maximum score; sk = skewness; ku =kurtosis

Table 3. Internal consistency of the AUTODDIS Scale.

Domains and Subscales		Cronbach's α		McDonald's ω		*N* items	
		PRO	REL	PRO	REL		
Volitional Action Domain		.946	.903	.947	.903	13	
	AUT	.916	.872	.917	.874		7
	SIN	.903	.842	.906	.850		6
Agentic Action Domain		.963	.956	963	.957	15	
	SDI	.961	.952	.962	.953		12
	SRE	.841	.855	.844	.859		3
Action-Control Beliefs Domain		.960	.945	.960	.946	18	
	REA	.909	.881	.909	.882		6
	EMP	.949	.927	.950	.929		12
AUTODDIS Scale		.982	.972	.983	.973	46	

Note: AUT = autonomy; SIN = self-initiation; SDI =self-direction; SRE = self-regulation; REA = self-realization; EMP = empowerment; PRO =professionals; REL = relatives

Table 4. Inter-rater reliability of the Scale and its domains and subscales.

	Rater 1 PRO M (SD)	Rater 2 REL M (SD)	χ2	p	ICC	95% CI	inter-rater rho	95% CI
AUT	19.49 (4.37)	19.01 (5.17)	0.03	.870	.707	.569 to .801	.543	.494 to .778
SIN	17.09 (3.42)	17.09 (3.42)	0	1	1.000		1.000	
SDI	27.19 (6,58)	26.51 (8.80)	0.38	.535	.710	.571 to .804	.601	.445 to .793
SRE	6.84 (1.73)	7.13 (2.21)	1.44	.230	.595	.404 to .725	.462	.289 to .618
REA	16.18 (2.78)	16.61 (3.50)	2.10	.148	.571	.368 to .708	.391	.193 to .565
EMP	31.24 (6.01)	30.29 (7.67)	1.91	.167	.808	.716 to .970	.597	.439 to .731
AV	36.55 (7.39)	36.18 (7.28)	0.04	.832	.892	.841 to .926	.747	.590 to .857
AA	34.04 (7.92)	33.73 (10.57)	0.05	.823	.712	.573 to .805	.612	.457 to .737
CC	47.42 (8.21)	46.92 (10.63)	0.38	.536	.771	.662 to .845	.566	.401 to .715
SD	118.01 (21.59)	116.52 (25.53)	0.23	.629	.832	.749 to .887	.653	.491 to .774

Note: AUT = autonomy; SIN = self-initiation; SDI =self-direction; SRE = self-regulation; REA = self-realization; EMP = empowerment; AV = Volitional Action Domain; AA = Agentic Action Domain; CC = Action-Control Beliefs Domain; SDTS = Self-determination total score; PRO =professionals; REL = relatives; M = mean; SD = Standard Deviation; ICC =intra-class correlation coefficient

Table 5. Spearman's correlations between AUTODDIS Scale and self-determination estimation items.

	AUT	SIN	SDI	SRE	REA	EMP
Volitional action estimation	.669	.756				
Agentic action estimation			.766	.600		
Action-control beliefs estimation					.645	.705
Global SD Estimation	.677	.770	.745	.598	.631	.725

Note 1: AUT = autonomy; SIN = self-initiation; SDI =self-direction; SRE = self-regulation; REA = self-realization; EMP = empowerment; SD = self-determination
Note 2: All correlations were significant at the .001 level.

Table 6. Spearman's correlations between AUTODDIS Scale and INICO-FEAPS Scale.

	AUT	SIN	SDI	SRE	REA	EMP
SD	.551**	.637**	.500**	.412**	.430**	.501**
RI	.364**	.381**	.309*	.347**	.305*	.358**
EW	.144	.182	.099	.192	.180	.220*
SI	.273*	.346**	.248*	.200	.300*	.398**
PD	.434**	.488**	.373**	.312*	.345**	.457**
IR	.224*	.269*	.276*	.149	.222*	.240*
MW	.286*	.320**	.252*	.192	.177	.305*
PW	-.093	.194	.104	.087	.157	.187
QOL	.444**	.514**	.379**	.344**	414**	.476**

Note: AUT = autonomy; SIN = self-initiation; SDI =self-direction; SRE = self-regulation; REA = self-realization; EMP = empowerment; SD =self-determination; RI = rights; EW = emotional wellbeing; SI = social inclusion; PD = personal development; IR = interpersonal relations; MW = material wellbeing; PW =physical wellbeing; QOL = Quality of life Index

*p<.01, **p<.001