Psychometric properties of the Spanish version of the *Self-Determination Inventory Student Report*: a Structural Equation Modeling Approach

Abstract

Instruments to measure self-determination have only been available in the Spanish language, to date, for adolescents with intellectual disability. However, given the development of a new measure of self-determination for youth with and without disabilities, the *Self-Determination Inventory*, there is a need to adapt and validate this tool in the Spanish language so as to provide practitioners with a psychometrically strong measure of self-determination. This study provides evidence of reliability and validity of the Spanish version of the scale, empirically tested with a sample of 620 youth with and without disabilities in Spain. Specifically, validity was evidenced through structural equation modeling approaches, confirming the instrument adequacy to measure self-determination in Spanish speaking youth. Future lines of research are suggested.

Keywords: Causal Agency Theory, Assessment, Self-Determination Inventory, Adolescence

Introduction

Research in self-determination has exponentially risen in recent years, especially in the special education field. However, the need to expand interventions to promote self-determination to all the students, regardless of disability status (Shogren, Wehmeyer, & Lane, 2016) has been recently stressed, in line with the development of a broader theoretical framework. Causal Agency Theory (Shogren, Wehmeyer, Palmer, Forber-Pratt, Little, & Lopez, 2015) builds on Ryan and Deci's (2000) self-determination theory and the functional model of self-determination (Wehmeyer, 1992) providing a theoretical conceptualization of the self-determination construct integrating emerging evidence from strengths-based perspectives, as well as elaborating on the development of self-determination and its application to all youth. Causal Agency Theory provides a framework to understand how people engage in self-determined actions, namely self-directed actions in service to a goal. Engaging in such actions triggers the development self-determination across contexts, although there will be contextual variance as people face different environmental demands for self-determination. As such, self-determination can either be promoted or thwarted by personal and environmental factors (e.g., classroom opportunities to engage in self-determined actions, Field & Hoffman, 2012).

Within Causal Agency Theory, self-determination has been defined as a "dispositional characteristic manifested as acting as the causal agent in one's life" (Shogren, Wehmeyer, Palmer, et al., 2015, p. 258). Self-determined actions are defined by three essential characteristics - volitional actions, agentic actions and action-control beliefs. These actions refer to the function that the action serves to the person. *Volitional action* includes self-initiation and autonomy and refers to making an intentional and autonomous choice based on one's interests and preferences. *Agentic action* is defined by self-regulation, self-direction, and pathways thinking and involves acting in service of a freely chosen goal by directing and

adjusting actions, and managing opportunities and hindrances as they occur. Finally, *action-control beliefs* are defined by control expectancy, psychological empowerment and self-realization and are shaped by one's self-knowledge of their capacities, abilities and supports' availability that are needed to reach a goal. It is assumed that enhancing capacities for volitional and agentic action can, in turn, shape own action-control beliefs. The role of enhanced action control beliefs builds on other work in the field that emphasizes the role of motivation (Ryan & Deci, 2000) and empowerment (Field & Hoffman, 1994; Hoffman & Field, 2006) to bolster self-determined actions..

Although Causal Agency Theory is related to previous theories of self-determination, as described previously, there are differences in the conceptualization of the essential characteristics of self-determination that have implications for assessment. In fact, autonomy, self-regulation, psychological empowerment and self-realization (derived from the functional model of self-determination essential characteristics) are part of Causal Agency Theory, as depicted in Table 1. However, within the Causal Agency framework, three overarching essential characteristics (i.e., volitional and agentic action, action-control beliefs) are defined as higher order constructs, with lower order component constructs (including autonomy, self-regulation, psychological empowerment and self-realization) embedded in each essential characteristics (see Table 1). This conceptualization allowed for the integration of new lower order component constructs, namely self-initiation, self-direction, pathways thinking and control expectancy, to integrate emerging research in positive psychology and disability. This provides an opportunity for enhanced understanding and more nuanced assessment of the essential characteristics of self-determination to accurately inform the decision-making process that guide interventions.

INSERT TABLE 1 ABOUT HERE

Thus, the above-mentioned differences necessitate new self-determination assessment tools aligned with Causal Agency Theory. Previous assessments, such as the The Arc's Self-Determination Scale (Wehmeyer & Kelchner, 1995) and the Self-Determination Assessment –online version- (Hoffman, Field, & Sawilowsky, 2015) are aligned with other theoretical frameworks and do not fully assess the essential characteristics of Causal Agency Theory. Given this, Shogren, Wehemeyer, Little and colleagues (2015) created the *Self-Determination Inventory: Student Report* (SDI:SR), the first instrument of a set of tools intended to measure the three essential characteristics and associated component constructs of self-determined actions of Causal Agency Theory. During the 2015-2016 academic school year the SDI:SR was validated in the U.S. As a result, in an effort to broaden the accessibility of the instrument, a validation initiative was launched to translate, adapt and validate the instrument into the Spanish language and context. To date, the only available instruments to measure self-determination in the Spanish language are a translation of The Arc's Self-Determination Scale (Verdugo, Gómez-Vela, Badia, González-Gil, & Calvo, 2009; Wehmeyer, Peralta, Zulueta, González, & Sobrino, 2006) or an adaptations based on this instrument, the ARC-INICO Self-Determination Scale (ARC-INICO Scale; Verdugo, Vicente, Fernández-Pulido, Gómez-Vela, Wehmeyer, & Guillén, 2015). Further, and perhaps more importantly, those instruments have only been validated with students with intellectual disability (Verdugo et al., 2015), leaving a large part of the youth population without access to a reliable self-determination tool.

Current Study

The purpose of this study was, therefore, to evaluate the psychometric properties of the field-test version of the SDI:SR (Spanish Version) with a large sample of children and adolescents with and without disabilities. To that end, the study seeks to provide evidence of 1) reliability of the scale dimensions, 2) construct validity based on the internal structure of

the scale through Confirmatory Factor Analysis and Exploratory Structural Equation Models, 3) concurrent validity based on correlations comparisons between the SDI:SR (Spanish version) and the ARC-INICO scale, and 4) discriminant validity based on measurement invariance of the scale in adolescents with and without disabilities.

Method

Participants

Study participants were intentionally recruited from 31 schools or college universities across different regions of Spain, primarily from Catalonia (86.5%) and the Community of Madrid (6.3%), Community of Valencia (4.4%), Balearic Islands (0.5%), Castile and León (0.5%) and Aragon (2.9%). In total, 620 middle school and high school youth in Spain participated in the study; 371 (59.8%) were students with disabilities enrolled in inclusive schools (8.1%) with their peers without disabilities or in segregated settings (91.9%) and 249 (40.2%) were students without disabilities enrolled in general education schools or universities. On average, students ranged in age from 13 to 22 years old (M = 16.86; SD = 2.06), the majority being male (58.1%). Most participants were originally from Spain (79.3%), as well as from Latin American (10.8%), Eastern European (1.8%), West Asian (2.6%) and African countries (5.5%). Most of the students were enrolled in 9th (22.3%) or 10th grade (28.7%). Students enrolled in beyond compulsory education programs were either in 11th or 12th grade (5.6%), in vocational training programs (25%), universities (13.2%), or transition to adult life programs for students with disabilities (5.2%). Table 2 provided further descriptive information regarding the educational setting and disability label for the subset of students with disability. To be included in this study, parental consent for participation and assent from the student was obtained.

INSERT TABLE 2 ABOUT HERE

Instruments

The Self-Determination Inventory: Student-Report (Spanish version). The SDI:SR is an instrument developed within a set of tools that operationalize the Causal Agency Theory (Shogren, Wehmeyer, Palmer, et al., 2015) and is intended to measure the essential characteristics and associated component constructs of self-determined action. There is a student report version, as well as a parent or educator report version of the assessment available, but in this study, only the student self-report version was used. The U.S. version upon which this translation is based has 51 items and is divided into three essential characteristics and eight component constructs (subdomains; see Table 1). The volitional actions domain has 13 items and gathers information about autonomy (6 items) and self-initiation (7 items). The agentic actions (16 items) domain includes self-regulation (6 items), self-direction (6 items) and pathways thinking (4 items) and refers to the ability to self-regulation and monitor progress while working toward goals. Finally, action-control beliefs (22 items) include control expectancy (9 items), psychological empowerment (7 items) and self-realization (6 items) and encompass one's self-knowledge of the capacities and the abilities that are used to reach a goal. To answer each item, students moved a cursor on a slider bar that marked their position between "I disagree" and "I agree". The more the student moved their cursor to the right, the more he/she agreed with the statement being answered. The slider bar captured numbers from 0 to 100 with two decimals precision. The self-regulation subdomain is however rated in a different way, as it comprises 6 items that represent 6 different situations, with a beginning and an end. The student is provided with 3 options to complete the middle of the situation, representing different ways to reach the end of the story given its beginning, and must match them to the following labels "best option", "next best option" and "worst option". The online version of the Spanish SDI-SR was then used in this study.

The SDI-SR American version has demonstrated moderate model fit in measurement invariance (χ^2 (34) = 63.861, RMSEA = .075, CFI = .976, TLI = .960, SRMR = .038) in adolescents with and without disabilities (Shogren, Wehmeyer, Little, 2015). However, with the self-regulation parcel being removed from the analysis, the model fit was found to be more satisfactory (χ^2 (22) = 36.472, RMSEA = .065, CFI = .988, TLI = .977, SRMR = .024). The Spanish adapted version has the same structure as the U.S one, except for the agentic actions domain that only include pathways thinking and self-direction as subdomains, as the self-regulation part was finally discarded after conducting reliability analysis during the field test (further explained below).

The ARC-INICO Self-Determination Scale. The ARC-INICO built on *The Arc's Self-Determination Scale* (Wehmeyer & Kelchner, 1995), which operationalized the functional model of self-determination (Wehmeyer, 1992; Wehmeyer, Kelchner, & Richards, 1996) to measure personal self-determination. The ARC-INICO has 61 questions that are divided in four scales that gather data on students' self-reported autonomy (25 items), self-regulation (12 items), empowerment (14 items), and self-knowledge (10 items). Scores are rated on a Likert scale ranging from 1 (Never) to 3 (Always) for the Autonomy domain, and from 1 (I totally disagree) to 4 (I totally agree) for the other three domains. This Spanish adaptation differs from the original instrument in that self-regulation is not measured through open-ended stories, but through 4-Likert scale items. The scale was developed and validated with 279 students with intellectual disability (Verdugo, Vicente, Fernández, Gómez-Vela, & Guillén, 2015; Vicente, Verdugo, Gómez-Vela, Fernández, & Guillén, 2015) and demonstrated adequate psychometric properties. Reliability was established (with internal consistency coefficients higher than .80) and construct validity was determined through confirmatory factor analyses, showing an acceptable model fit (RMSEA = .060, GFI = .997, AGFI = .995, SRMSR = .052). For this study purposes', the ARC-INICO scale was used to

establish concurrent validity of the SDI:SR (Spanish version).

Procedures

Translation, adaptation and pilot test

For the cultural adaptation of the SDI:SR, Tassé and Craig (1999) guidelines were followed. Two official translators translated the instrument independently into Spanish. Both translations were shared and discrepancies were resolved by the first and third authors so as to develop one first version of the scale in Spanish. This translation was sent to a second committee, which evaluated it based on the original version and the translations provided by the first committee. The comments and possible amendments of the second committee were sent to the first and third authors for assessment. Comments were analyzed until a consensus between researchers was reached. Then a back translation was performed to ensure the quality of the translation. The back translation showed that the final translation reflected the content of the original questionnaire. This preliminary version was reviewed by five experts (researchers and professionals) to identify elements that were not applicable to the Spanish culture. Specifically, experts' opinions were gathered regarding items' clarity and their importance and suitability. All comments were analyzed and discussed by the authors until common agreement was reached. In general, few modifications of the scale were made, such as rewording some generic nouns, though for the self-regulation part, cultural adaptations were also needed (e.g., being elected as the class delegate, instead of president of a club). Answer options were revised, so as to guarantee homogeneity within the three types of responses available: (1) the best self-regulated action allowing to reach the end of the story, (2) the next best option (i.e., acting in a less appropriate way though still reaching the goal), and (3) a do-nothing answer (i.e., a situation were nothing is done to reach the final aim).

Then, after the experts' changes were implemented, a pilot study was performed to test this instrument preliminary version. Administrators of general education schools and

universities and special schools (i.e., segregated schools for students with intellectual disability, the predominant service model in Spain) were contacted by email and phone to explain the details of the study. In total, 2 general education schools, a college university and 9 special education schools agreed to participate. The inclusion criteria for students to participate were to be aged between 13 and 22 years old and, for students with disabilities, to provide reliable information when answering the questions (with support if needed). Only those students with consent for participation were included. In total, 114 middle school and high school youth participated in the study; 55 (48.2%) were students with disabilities and 59 (51.8%) were students without disabilities. On average, students were 17 years old (M = 17.36; SD = 2.70), ranging from 13 to 22, the majority being female (66.7%). The SDI:SR (Spanish version) and the ARC-INICO Scale were answered by the students in a self-report format, although teachers and the first author provided support (i.e., items clarification) when needed. Results of the pilot test demonstrated empirical evidence of poor psychometric indexes of the self-regulation domain, specifically in terms of internal consistency; so further changes were made in this domain. Instructions were deeply rephrased so as to guarantee a better comprehension and answers options were again revised. Similarly, the American version showed an increase of the internal consistency indices for the agentic action construct after withdrawing the self-regulation subdomain both for participants with and without disabilities (Shogren, Wehmeyer, Little, et al., 2015).

Field test

Given that the target age of participants was 13-22, we intentionally contacted general education schools, universities and special schools spread throughout the geographical zones of Spain. A Spanish organization devoted to advocating for the rights of people with disabilities, needs and interests, *Plena Inclusión,* helped us to identify schools, either regular or segregated, where students with disabilities were enrolled in each geographical zone. To

be included in this study, schools needed to have computers for their students to answer, as well as Internet connection, as the self-determination surveys were administered online. From the 48 schools contacted (23 special education schools, 20 general education schools and 5 universities), 6 general education schools, 4 universities, and 21 special schools agreed to participate in the study and all of them met the above-mentioned requirement. Regarding students' selection, different procedures were followed for students with and without disabilities. For students with disabilities, a sample of the questionnaires was sent to special and general education schools, so as teachers could intentionally chose students with disabilities aged 13 to 22 years who could provide reliable information when answering the questions (i.e., students who were able to comprehend the items if support was provided). In parallel, for students without disabilities, general education schools were asked to select a class between 9th and 12th grade, and universities were asked to select a 1st, 2nd or 3rd year class. Once potential participants were selected, consent (either from the parent or the participant if they were of legal age) was obtained. For student participants who were not of legal age, assent was also obtained.

Students responded to two online self-report surveys. They were first asked to complete the SDI:SR (Spanish version) followed by the ARC-INICO Scale and were provided as much time as needed to complete the scales. Teachers were available to explain item meanings and the response system consistent with the scales administration protocols. Students could be provided with different kinds of supports, including: facilitating access to information (i.e., reading the questions) and understanding and interpreting questions (i.e., giving synonyms of misunderstood words). If there were missing answers, teachers followed up with students to determine if they decided to leave the items unanswered (n = 4) or if they inadvertently skipped questions to complete them.

Data Analysis

The reliability of the scale was first assessed by examining internal consistency values, specifically Cronbachs' alpha. Self-regulation questions were discarded of the subsequent analyses due to low internal consistency values, similar to the original version that showed low internal consistency indices and factor loadings in this domain (Shogren, Wehmeyer, Little, et al., 2015). Second, construct validity was examined using confirmatory factor analysis (CFA) with the first (associated component constructs) and second (essential characteristics) order-factor structure provided in Table 1, using a Maximum Likelihood solution. Fit estimation values are reported both for the whole sample and for two randomly selected subsamples of the overall sample. Specifically, two subsamples of 310 participants each were randomly generated so as to compare their model fit to further establish construct validity. Configural invariance was also examined in these two subsamples. Correlations between measurement errors across items were assumed in specifying the CFA models. Additionally, the measurement structure was confirmed through Exploratory Structural Equation Model (ESEM; Asparouhov & Muthén, 2009), which provided information in addition to the CFA estimation as the factor loadings of both the observable items and the latent variables can be reported whereas the CFA measurement models fixed factor loadings at zero, so as to confirm other factors' influence. In this sense, CFA models, in fixing factor loadings at zero, restrictions are applied to the measurement model that relies on theoretical assumptions (Asparouhov & Muthén, 2009). The purpose of ESEM is then to allow less restrictive measurement models to be used in addition to the traditional CFA to provide additional information on the fit of the theoretical model. Third, concurrent validity, which is demonstrated when a test correlates with a measure that has previously been validated, was analyzed through Pearson correlations between SDI:SR (Spanish version) and ARC-INICO scale. As the Causal Agency Theory builds in Wehmeyer's functional theory for self-determination, the constructs were hypothesized to be related across scales. Finally,

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discriminant validity was also analyzed. Model fit was first examined separately for the group of students with and without disabilities. Configural invariance was then analyzed to determine if the same construct was being measured across groups. Differences between the means of adolescents with and without disabilities were finally explored for the seven first-order factors (omitting self-regulation). Analyses were performed with IBM SPSS statistical package .22 and Mplus software (5.0) (Muthén & Muthén, 2012), with statistical correction for the presence of missing data ($n = 4$) utilized.

Results

In terms of internal consistency, subdomains Cronbach's alphas were acceptable, ranging from .627 for autonomy to .830 for control expectancy, though higher values for the autonomy subdomain would have been more suitable. The remaining subscales fell between autonomy and control expectancy: self-initiation (.765), self-direction (.795), pathways thinking (.806), empowerment (.779) and self-realization (.757). Overarching domains also reported good to excellent Cronbach's alphas: volitional actions (.815), agentic actions (.874) and action-control beliefs (.911). Regarding construct validity, although there is not complete agreement in the field regarding interpretation of goodness-of-fit indices, the following were taken into consideration for model fit interpretation, according to Hu and Bentler (1999): the χ^2 to degrees of freedom ratio (χ^2/df), that are either acceptable (χ^2/df < 5), good (χ^2/df < 3), or excellent (χ^2/df < 2); the Comparative Fit Index (CFI ≥ .90); the Tucker Lewis Index (TLI ≥ .90); the Standardized Root Mean Square Residual (SRMSR < .08); and the Root Mean Square Error of Approximation (RMSEA < .06). BIC and AIC indices were also considered. The values obtained showed an acceptable model fit (CFI = .942, TLI = .953, SRMSR = .106, RMSEA = .05, BIC = -126370.977, AIC = -125772.965), except for the SRMSR and the chi-square test. Lower values for SRMSR index would have been more adequate. Also, the chi-square test was statistically significant (χ^2 (945) = 2877.92, $p < .001$),

though chi-square is usually highly influenced by large effect sizes (Hooper, Coughlan, & Mullen, 2008). However, the value of the ratio of χ^2 by degrees of freedom; which stands as a reasonable index for global fit (Byrne, 2013), specially considering chi square index weaknesses; was good (3.045). Similar goodness-of-fit values were found when assessing construct validity by comparing the two randomly selected subsamples (see Table 3). Configural invariance was established (χ^2/df = 2.823, CFI = .986, TLI = .991, SRMSR = .03; RMSEA = .06, BIC = -124121.1, AIC = -123672.1) for these two subsamples, asserting the construct validity across randomly selected groups. Finally, Table 4 depicts the factor loadings of first and second order factors resulting from the ESEM estimation, all of them being statistically significant and showing acceptable loads in their corresponding subdomain, ranging from .378 to .681 and from .401 to .511 for second order factors.

INSERT TABLE 3 AND 4 ABOUT HERE

In terms of concurrent validity, all the tested correlations between SDI: SR (Spanish Version) second order factors (essential characteristics) and ARC-INICO sections were acceptable and statistically significant. Volitional actions and Autonomy (ARC-INICO) were highly correlated (r = .537) and shared a 28.8% (R^2 = 0.288) of the variance. Agentic Actions and Self-regulation (ARC-INICO) showed a good correlation (r = .502) and shared the 25.5% (R^2 = 0.252) of the explained variance. Action-Control beliefs dimension was highly correlated with Empowerment (ARC-INICO) (r = .541) and Self-knowledge (r = .463), and explained 29.3% (R^2 = 0.293) and 21.4% (R^2 = 0.214) of its variance respectively, all of which would be predicted by Causal Agency Theory. The correlation matrix of the ARC-INICO dimensions and the SDI:SR (Spanish version) first order factors (associated component constructs) are displayed in Tables 5 to 7. All correlations were actually acceptable and statistically significant and ranged from .463 for Self-direction and Self-regulation (ARC-INICO) to .534 for the SDI:SR and ARC-INICO Empowerment dimension.

INSERT TABLES 5 TO 7 ABOUT HERE

Finally, measurement invariance was established across the disability and no disability groups. Model fit was acceptable for the subsamples of students with disabilities and without disabilities (see Table 8). A two-group CFA model was used to examine measurement invariance across the disability and no disability groups. The model fit for configural invariance was good (χ^2/df = 1.511, CFI = .982, TLI = .979, SRMSR = .02, RMSEA = .042, BIC = -102233.76, AIC = -102233.76). Once measurement invariance was established across groups, differences between the latent means of students with and without disabilities were also probed. All the differences were statistically significant ($p < .01$) and suggested higher scores in adolescents without disabilities, except for the self-realization ($t(573) = -1.823$, $p = .069$) and the control expectancy ($t(571) = .154$, $p = .878$) subdomains and the action-control beliefs domain ($t(579) = -1.417$, $p = .157$), which did not statistically differ.

INSERT TABLE 8 ABOUT HERE

Discussion

As stated, the main aim of this study was to evaluate the psychometric properties of the field-test version of the SDI:SR (Spanish version) with students with and without disabilities. Results provided empirical evidence of reliability, construct validity, concurrent validity and discriminant validity. Results suggested acceptable reliability indicators (Cronbach's alpha) ranging from .627 to .830 for SDI:SR (Spanish version) subdomains and from .815 to .911 for the three overarching essential characteristics. These results were similar to the SDI:SR American version, pilot test data (Shogren, Wehmeyer, Little, et al., 2015). Main differences were found in the agentic actions domain with the original version reporting lower values in students with (.767) and without disabilities (.693) than the Spanish version (.874). Construct validity was established with goodness-of-fit values for the whole

sample as well as for two randomly generated subsamples confirming that the empirically tested model aligned with Causal Agency Theory. Specifically, in the Spanish sample, there were seven first-order factors and three second-order factors as shown in Table 1. The only exception was the self-regulation subdomain, which was not tested because of its low reliability values. This is similar to findings from the US on the English version of the SDI:SR which showed better model fit and reliability results without the self-regulation domain (Shogren, Wehmeyer, Little, et al., 2015). Concurrent validity was also established with the ARC-INICO Self-determination scale. SDI:SR (Spanish version) second order factors and ARC-INICO dimensions were highly and significantly correlated and shared 21.4% to 29.3% of the explained variance, confirming the relationship between the functional theory of self-determination, on which ARC-INICO Scale is based, and Causal Agency Theory. Finally, discriminant validity was determined by measuring configural invariance across groups (youth with and without disabilities), suggesting that the same construct was actually being measured in the two groups, as it also stated in preliminary analysis of the SDI:SR original version (χ^2 (22) = 36.472, χ^2/df = 1.658; RMSEA = .065, CFI = .988, TLI = .977, SRMR = .024) (Shogren, Wehmeyer, Little, et al., 2015). This finding is important, as previous measures in the Spanish context have never been validated across students with and without disabilities. Differences in construct scores between groups were statistically significant, except for the action-control beliefs domain, self-realization and control expectancy, suggesting there are disability related differences. Action-control beliefs is actually the Causal Agency Theory domain that operationalizes the person's beliefs in having what it takes to reach goals, convictions that are based on previous goal-based experiences. The other two domains focus on what and how the person does so as to engage in self-determined actions, which lay the foundations for action-control beliefs to develop. That differences were found in the domains that depict how the person acts, but not on the one

operationalizing what the person thinks he/she can do, suggests that in adolescent with disabilities, considering ways to teach skills to enable action may be highly important, although future research is needed. It is possible that youth with disabilities have had fewer experiences to improve their self-determination skills within their developmental contexts, although they may have heard messages given the increased focus on self-determination in the field, that such actions are possible.

Though instructive, there are limitations to the study that must be taken into consideration. The ARC-INICO Self-Determination scale was used in this study to demonstrate concurrent validity for both students with and without disabilities, thought it has only been validated with students with intellectual disability. However, due to the lack of available measures in Spanish language for adolescents with disabilities other than intellectual disability and without disabilities, the ARC-INICO Self-Determination scale was used for the whole sample. Further, the self-regulation domain was withdrawn due to empirical evidence of poor reliability indexes.

The self-regulation subdomain was measured differently, asking respondents to complete a story deciding the best, the next best and the worst answer, based on a system used on The Arc's Self-Determination Scale. These items were derived from the means-ends problem solving technique (Platt & Spivack, 1989). This technique examines the use of interpersonal cognitive problem-solving to solve a series of specific situations (Wehmeyer, 1995), which necessitates questions that ask respondents to generate, or in the SDI:SR to identify, the means to achieve outcomes, given a specific problem. However, for the other seven domains of the Causal Agency Theory operationalized in the SDI:SR, items were generally written more abstractly so as to be applicable for a wide number of situations. The specificity of the situations described in the self-regulation subdomain might have been one of the reasons of the poor reliability scores, particularly as not all youth may have

experienced these types of situations. In parallel, lower internal consistency indices were also reported for the autonomy subdomain, when compared to other subdomains, in line with the preliminary results of the original version regarding volitional actions of the SDI:SR (Shogren, Wehmeyer, Little, et al., 2015). Some of the autonomy items are also based on examples of situations, as for the self-regulation domain, being then less prone to be overlaid across contexts, and thus responses may strongly depend on the adolescent previous exposure and engagement in those situations. Items forming self-regulation subdomain were clearly measuring different things, indicating a need to further explore how to effectively assess self-regulation in general, without focusing on explicit situations that mimics real life (Cascallar, Boekaerts, & Costigan, 2006). Although there is a wide body of literature focused on self-determined learning and its measurement (Cascallar, et al., 2006), further work is needed to effectively measure general self-regulation. Moreover, self-regulation in itself is a complex enough construct, formed by multiple skills including self-monitoring and self-assessment, and finding a single set of items to measure this construct is challenging. Further research is needed to identify ways to successfully measure self-regulation as a part of the self-determination construct.

The seven first-order factors structure of the empirically tested SDI:SR (Spanish version) has thrown an acceptable solution, both for children and adolescents with and without disabilities, in line with preliminary results of the SDI:SR original version validation (Shogren, Wehmeyer, Little, et al., 2015). The SDI:SR (Spanish version) stands then as a psychometrically strong measure to operationalize Causal Agency Theory in Spanish speaking populations[1]. Given the statistically significant differences in scores, further work is needed to determine if different normative standardized scores are needed to assess youth

[1] The SDI:SR (Spanish version) used in this study is available upon request by contacting the first author.

with and without disabilities with the same instrument. Further, though configural and measurement invariance suggest that, for the moment, all items can be retained, ESEM results allows for an identification of the potential items to be removed (e.g., those with <.40 loadings). Before considering shortening the scale though, further work is needed to examine items discrimination patterns, and to jointly analyze the original and adapted versions results to explore items functioning to guide the decision-making process towards modifying the scale. However, for the first time to date, professionals from education and psychology field will have access to a reliable measurement tool validated in Spanish language to assess self-determination in youths with and without disabilities. The SDI:SR (Spanish version) has fulfilled this need, providing the field with a psychometrically strong tool, empirically validated, based on the newest theoretical framework that can be used in students with and without disabilities. Future research should further examine the relationship of the SDI:SR with assessments rooted in different theoretical frameworks (e.g., Self-Determination Assessment, Hoffman, Field, & Sawilowsky, 2015).

Assessment, a fundamental step in any psychological-educational process, allows for the identification of specific needs to guide the decision making process, as well as to establish a tailored instructional or clinical program. Assessment tools provide necessary ongoing feedback of a clinical or instructional implementation or progression, determining its effectiveness and the issues to be improved or changed. In this line, future work within the Spanish context should focus on broadening the accessibility and use of the SDI:SR (Spanish version) in educational and psychological contexts, as the main aim of this measure remains to serve professionals working with children and adolescents with and without disabilities and guide decision making related to self-determination instruction.

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Table 1

Essential Characteristics and associated Component Constructs as Proposed by Causal Agency Theory

Essential Characteristics	Associated Component Constructs
Volitional Action	Autonomy
	Self-Initiation
Agentic Action	Self-Regulation
	Self-Direction
	Pathways Thinking
Action-Control Beliefs	Psychological Empowerment
	Self-Realization
	Control expectancy

Table 2

Demographic information of the participants with disabilities

	Students with disabilities	
	N	%
School setting		
Special education school	341	91.9
General education school	30	8.1
Grade		
9th grade	84	22.64
10th grade	137	36.93
12th grade	3	0.81
Vocational training programs	116	31.26
Transition to adult life programs	31	8.36
Disability type		
Intellectual Disability	342	92.2
Mild	119	34.8
Moderate	149	43.57
Severe	74	21.63
Attention Deficit and Hyperactivity Disorder	59	15.9
Learning Disability	116	31.27
Visual Impairment	8	2.16
Hearing Impairment	14	3.77
Autism Spectrum Disorder	41	11.05
Language and Communication Disorders	19	5.12
Emotional and Behavioral Disorders	68	18.33
Mental Health problems	37	9.97
Genetic Syndromes	12	3.23
Motor Impairment	13	3.5

Table 3

Fit indices of CFA model of the two randomly selected subsamples

Subsample	Goodness-of-fit indices							
	χ^2	DF	Ratio	CFI	TLI	AIC	BIC	SRMSR
A	2745.02	945	2.904	.964	.955	-114123.12	-114634.12	.05 (.04 - .06)
B	2893.12	945	3.061	.959	.949	-114345.78	-114512.71	.05 (.04 - .06)

Table 4

Factor loadings derived from the ESEM estimation for the SDI:SR (Spanish version) for the 7 subdomains

Items	Latent Variables									
	AUT	SIN	SDIR	PTH	EMP	SRE	EXP	VOL	AGEN	ACC
Item 1	.546									
Item 2	.488									
Item 3	.623									
Item 4	.588									
Item 5	.498									
Item 6	.601									
Item 7		.632								
Item 8		.588								
Item 9		.477								
Item 10		.493								
Item 11		.521								
Item 12		.533								
Item 13		.611								
Item 14			.597							
Item 15			.636							
Item 16			.577							
Item 17			.423							
Item 18			.501							
Item 19			.449							
Item 20				.378						
Item 21				.566						
Item 22				.681						
Item 23				.554						
Item 24					.402					
Item 25					.389					
Item 26					.416					
Item 27					.477					

Item 28	.399				
Item 29	.489				
Item 30	.523				
Item 31		.671			
Item 32		.588			
Item 33		.541			
Item 34		.500			
Item 35		.523			
Item 36		.477			
Item 37			.523		
Item 38			.612		
Item 39			.509		
Item 40			.487		
Item 41			.499		
Item 42			.511		
Item 43			.602		
Item 44			.579		
Item 45			.544		
Second Order Factors					
AUT				.423	
SIN				.401	
SDIR					.477
PTH					.408
EMP					.511
SRE					.502
EXP					.478

Note: All factors coefficients $p < .001$. Model fit indices: $\chi^2 = 612.23$, $df = 572$, $p = .0118$, CFI = .982, TLI = .0877, RMSEA = .02. AUT = Autonomy, SIN = Self-initiation, SDIR = Self-direction, PTH = Pathways thinking, EMP = Empowerment, SRE = Self-realization, EXP = Control Expectancy, VOL = Volitional Actions, AGEN = Agentic Actions, ACC = Action-control beliefs.

Table 5

Pearson correlations matrix between SDI:SR Volitional Actions and ARC-INICO Autonomy

	1	2	3	4
1.Volitional actions (SDI:SR)	1			
2. Autonomy (SDI:SR)	.869*	1		
3. Self-initiation (SDI:SR)	.923*	.611*	1	
4. Autonomy (ARC-INICO)	.537*	.490*	.479*	1

Note: * $p < .001$

Table 6

Pearson correlations matrix between SDI:SR Agentic Actions and ARC-INICO Self-regulation domain

	1	2	3	4
1. Agentic actions (SDI:SR)	1			
2. Self-direction (SDI:SR)	.944*	1		
3. Pathways thinking (SDI:SR)	.900*	.707*	1	
4. Self-regulation (ARC-INICO)	.502*	.463*	.466*	1

Note: * $p < .001$

Table 7

Pearson correlations matrix between SDI:SR Action-Control Beliefs and ARC-INICO Empowerment and Self-knowledge domains

	1	2	3	4	5	6
1. Action-Control beliefs (SDI:SR)	1					
2. Empowerment (SDI:SR)	.900*	1				
3. Self-realization (SDI:SR)	.859*	.703*	1			
4. Control expectancy (SDI:SR)	.920*	.732*	.668*	1		
5. Empowerment (ARC-INICO)	.541*	.534*	.489*	.447*	1	
6. Self-knowledge (ARC-INICO)	.463*	.392*	.469*	.396*	.666*	1

Note: * $p < .001$

Table 8

Fit indices of CFA models of students with and without disabilities samples

Subsample	Goodness-of-fit indices							
	χ^2	DF	Ratio	CFI	TLI	AIC	BIC	SRMSR
With	1633.11	945	2.786	.964	.961	-114933.18	-114971.03	.05 (.04 - .06)
Without	1641.12	945	2.794	.951	.953	-115002.12	-115113.43	.05 (.04 - .06)