

## Self-determination operationalization and conceptualization in young people with and without disabilities

Cristina Mumbardó Adam

<http://hdl.handle.net/10803/664662>

**ADVERTIMENT.** L'accés als continguts d'aquesta tesi doctoral i la seva utilització ha de respectar els drets de la persona autora. Pot ser utilitzada per a consulta o estudi personal, així com en activitats o materials d'investigació i docència en els termes establerts a l'art. 32 del Text Refós de la Llei de Propietat Intel·lectual (RDL 1/1996). Per altres utilitzacions es requereix l'autorització prèvia i expressa de la persona autora. En qualsevol cas, en la utilització dels seus continguts caldrà indicar de forma clara el nom i cognoms de la persona autora i el títol de la tesi doctoral. No s'autoritza la seva reproducció o altres formes d'explotació efectuades amb finalitats de lucre ni la seva comunicació pública des d'un lloc aliè al servei TDX. Tampoc s'autoritza la presentació del seu contingut en una finestra o marc aliè a TDX (framing). Aquesta reserva de drets afecta tant als continguts de la tesi com als seus resums i índexs.

**ADVERTENCIA.** El acceso a los contenidos de esta tesis doctoral y su utilización debe respetar los derechos de la persona autora. Puede ser utilizada para consulta o estudio personal, así como en actividades o materiales de investigación y docencia en los términos establecidos en el art. 32 del Texto Refundido de la Ley de Propiedad Intelectual (RDL 1/1996). Para otros usos se requiere la autorización previa y expresa de la persona autora. En cualquier caso, en la utilización de sus contenidos se deberá indicar de forma clara el nombre y apellidos de la persona autora y el título de la tesis doctoral. No se autoriza su reproducción u otras formas de explotación efectuadas con fines lucrativos ni su comunicación pública desde un sitio ajeno al servicio TDR. Tampoco se autoriza la presentación de su contenido en una ventana o marco ajeno a TDR (framing). Esta reserva de derechos afecta tanto al contenido de la tesis como a sus resúmenes e índices.

**WARNING.** The access to the contents of this doctoral thesis and its use must respect the rights of the author. It can be used for reference or private study, as well as research and learning activities or materials in the terms established by the 32nd article of the Spanish Consolidated Copyright Act (RDL 1/1996). Express and previous authorization of the author is required for any other uses. In any case, when using its content, full name of the author and title of the thesis must be clearly indicated. Reproduction or other forms of for profit use or public communication from outside TDX service is not allowed. Presentation of its content in a window or frame external to TDX (framing) is not authorized either. These rights affect both the content of the thesis and its abstracts and indexes.

# DOCTORAL THESIS

## SELF-DETERMINATION OPERATIONALIZATION AND CONCEPTUALIZATION IN YOUNG PEOPLE WITH AND WITHOUT DISABILITIES

**Cristina Mumbardó Adam**

Supervised by  
Dr. Climent Giné Giné and Dr. Joan Guàrdia Olmos





## DOCTORAL THESIS

Title	Self-determination operationalization and conceptualization in young people with and without disabilities
Presented by	Cristina Mumbardó Adam
Centre	Faculty of Psychology, Education and Sport Sciences
Department	Psychology
Directed by	Dr. Climent Giné Giné and Dr. Joan Guàrdia Olmos



---

This doctoral thesis has been supported by the private foundation Crèdit Andorrà, the Government of Catalonia Secretariat of Universities and Research of the Business and Knowledge Department [Secretaria d'Universitats i Recerca del Departament d'Economia i Coneixement de la Generalitat de Catalunya], and the Social European funds with the support for hiring research staff FI-DGR (2016 FI\_B 00253, 2017 FI\_B1 00115 and 2018 FI\_B2 00138).

---



A qui dedico aquest treball, és més que evident.

El perquè, també.

A tu Àvia.



## ACKNOWLEDGEMENTS/AGRAÏMENTS

---

Aquest treball ha estat fruit d'un camí ple de coneixements, treball i esforç que ara emprenc però que cal seguir llaurant. Tots els que em coneixeu i m'heu acompanyat heu format part, en certa manera, d'aquest camí que tot just comença, i en el qual em vull aturar avui per donar les gràcies.

Vull adreçar un agraïment sincer a les persones que han format part de la mostra d'aquest treball, tant als joves i adolescents com als seus professors que s'han prestat voluntaris per a participar en aquest treball, i que m'han brindat també l'oportunitat de compartir unes estones que certament han enriquit, en lo personal, aquest treball.

No cal dir que aquest treball no hagués estat possible sense l'acompanyament i el guiatge dels meus dos directors. Gràcies Climent, per confiar en mi, per escoltar-me i aconsellar-me i per obrir-me les portes a la recerca i a l'àmbit de la discapacitat que tant respectem i valorem. Gràcies Joan, per transmetre'm el teu rigor i respecte per aquesta professió, però sobretot, per la teva paciència i per exigir-me sempre més i millor. Soc sens dubte una afortunada per haver fet aquest camí amb vosaltres.

M'agradaria també recordar en aquestes línies a tot l'equip del *Beach Center on Disability / Kansas University Center on Developmental Disabilities* que em va acollir durant l'estada de recerca, en especial a la Dra. Karrie Shogren, al Dr. Mike Wehmeyer, al Dr. Jim Thompson i a la Dra. Leslie Shaw. *Thank you for making me feel at home in Lawrence and for sharing your time and knowledge. A sincere thank you to my friend (almost Dr.) Sheida K. Raley. From continent to continent, we share interests, laughs, and inspire one another.*

M'agradaria expressar també el meu més sincer agraïment als companys del grup de recerca DISQUAVI, amb els què he compartit dubtes, interessos, projectes i que m'han donat un espai de formació impagable. Un "gràcies" molt sincer a la Natasha i l'Ana Luisa que hem van acollir quan no tenia gaire clar què volia dir la paraula "recerca". Gràcies David per transmetre'm la teva passió per la recerca i la teva curiositat infinita, per creure en mi i donar-me mil oportunitats d'aprenentatge. Però sobretot, gràcies a tu Cris, de qui he après molt més del què creus. Gràcies per compartir tots els moments d'aquest camí, els bons i no tan bons, els professionals i els personals. Gràcies pel teu immens cor i per fer que aquest tàndem sigui indissoluble.

El meu més sincer agraïment també als membres del grup de recerca GTEAAP, sense qui tampoc em puc imaginar aquest camí. Gràcies, a tots, per regalar-me el vostre temps. Un "gràcies" especial a la Laia, la Núria, el Marc, l'Alba i la Cris, amb qui he compartit molts moments que han fet, sense cap dubte, molt més amè el camí.

Voldria també dedicar unes línies a tots aquells companys i companyes de l'aula de recerca amb qui he tingut la gran sort de compartir dubtes, alegries, desencants i incomptables cafès. Gràcies per fer que venir a treballar cada dia fos un privilegi. Gràcies Sílvia per la teva energia, i per tot allò que m'enduc amb tu en l'àmbit personal. *Gracias a ti también Eva, por nuestras conversaciones y discusiones con las que he aprendido más de lo que querrás reconocer y, sobre todo, por poner el listón tan alto.*

Gràcies també a tot l'equip d'IDAPP, i en especial a la Noemí i el Sergi, per fer-me sentir a casa, lluny de casa i per donar-me l'oportunitat de formar part d'aquesta gran família que m'ha donat un espai de creixement personal i professional. Gràcies i gràcies!

Gràcies també a tots aquells amics i amigues que segueixen aquí. En especial, gràcies Nat i Sandra per ser i estar, però sobretot per il·lusionar-vos sincerament amb mi, per entendre'm i per cuidar com cuidem els nostres moments. Gràcies Lorena, per entendre'ns sense paraules, per ser un exemple a seguir, per tot i per més.

El més sincer i profund dels agraïments és, com no podria ser d'una altra manera, per a la meva família. A tots vosaltres, gràcies. A la meva àvia, per ser la persona que més trobo a faltar en el meu dia a dia i perquè no seria qui soc avui sense tu. Als meus pares, gràcies infinites. Per ensenyar-me a llegir el món, per a què jo pugui escriure el meu camí. Per fer-me costat, per ser el millor exemple de vida i per fer-me sentir orgullosa cada dia de ser la vostra filla. Al meu germà, gràcies perquè ser germana em fa ser millor persona, però sobretot per ensenyar-me que dues persones ben diferents es poden estimar de forma incondicional. I gràcies a tu, vint vegades gràcies. Per l'equip que formem i per ser el millor company de vida. Sempre demanant si ja havia trobat algun tresor quan, en realitat, l'he tingut durant tot el camí al costat.



<b>1. INTRODUCTION</b>	<b>5</b>
1.1. Intellectual Disability conceptualization	7
1.2. Quality of life paradigm	9
1.3. Dissertation Layout	12
<b>2. THEORETICAL FRAMEWORK</b>	<b>17</b>
2.1. Overview of self-determination theories	19
2.1.1 The Self-determination Theory	21
2.1.2 The functional theory of self-determination	23
2.1.3 Causal Agency Theory	25
2.2. Self-determination assessment	29
2.3. Self-determination promotion	36
2.4. Self-determination and contextual factors	44
<b>3. OBJECTIVES</b>	<b>47</b>
<b>4. RESULTS</b>	<b>53</b>
4.1. Measuring the essential characteristics of self-determination:	
The Spanish version of the Self-Determination Inventory (SDI:SR)	55
4.1.1. SDI:SR adaptation to Spanish context	55
4.1.2. Exploration of SDI:SR scores psychometric properties	88
4.1.3. The impact of disability in self-determination measurement	89
4.2. Measuring opportunities to engage in self-determined actions:	
The Spanish version of the AIR Self-determination Scale	90

4.3. Impact of contextual opportunities on self-determination dimensions	97
<b>5. GENERAL DISCUSSION</b>	<b>123</b>
5.1. Limitations	125
5.2. Instruments adaptation and validation to Spanish context	128
5.3. Analysis of psychometric properties of the SDI:SR (Spanish version)	
scores	129
5.4. Impact of contextual opportunities in self-determination	131
5.5. Conclusions	133
<b>6. REFERENCES</b>	<b>135</b>

## TABLES INDEX

---

<b>Table 1.</b> Factor structure of the QoL model (adapted from Wang et al., 2010)	10
<b>Table 2.</b> Some component elements of self-determination	24
<b>Table 3.</b> Essential characteristics and components constructs relationship amongst Causal Agency Theory and the functional theory of self-determination (extracted and adapted from Shogren et al., 2015, p. 260)	27
<b>Table 4.</b> Summary of self-determination theories and related assessments	31
<b>Table 5.</b> Self-determination essential characteristics, component elements and related teaching strategies (adapted from “Self-determination Inventory,” n.d., and Wehmeyer & Shogren, 2017)	37
<b>Table 6.</b> Summary of self-determination instruction curricula and packages.	41
<b>Table 7.</b> Summary of articles and their corresponding thesis’ objectives.	50

## FIGURES INDEX

---

<b>Figure 1.</b> Conceptual framework of human functioning (extracted from Schalock et al., 2010, p. 14)	8
<b>Figure 2.</b> Theoretical model of self-determination development (extracted from Shogren, Little, & Wehmeyer, 2017, p.19)	26





# *01*

## *INTRODUCTION*

---



## **1.1. Intellectual Disability conceptualization**

The conceptualization of intellectual disability (ID) has evolved during the last decades, largely due to the endeavors and advances of diverse disability related disciplines (psychology, medicine, education, rights, sociology...) that allow for a better comprehension of people with ID and their needs. Those efforts have brought new understanding on ID terminology and the model used to comprehend human functioning. Thus, the latest definitions of IDD (Luckasson et al., 1992, 2002; Schalock et al., 2010), have supposed a change of paradigm, from understanding ID as a deficit characteristic of the individual, to embrace a socioecological concept based on the interaction of the person and their environment (Schalock, 2013). Within the socio-ecological model of disability, a disability is understood as the expression of the mismatch between the person's characteristics and contextual challenges and expectations (Schalock et al., 2010). This socioecological perspective has been imbuing ID definitions proposed by several international organizations. The American Association on Intellectual and Developmental Disabilities, in his latest manual, has defined ID as being characterized by significant limitations both in intellectual functioning and in adaptive behavior as expressed in conceptual, social, and practical adaptive skills (Schalock et al., 2010). These limitations must originate during the developmental period. The inclusion of adaptive behavior as a criterion to diagnose ID within the American Psychiatry Association Diagnostic and Statistical Manual of Mental Disorders (APA, 2013) clearly illustrates this shift of paradigm, and defines this construct as "a disorder with onset during the developmental period that includes both intellectual and adaptive behavior deficits in conceptual, social, and practical domains" (American Psychiatric Association, APA, 2013, p. 33). Importantly, intellectual functioning and adaptive behavior must be jointly considered, and treated as coequals when assessing ID for diagnosis purposes (Tassé, Luckasson, & Schalock, 2016). Further, ID severity is no longer defined based on IQ scores, but on a four-level system based on adaptive behavior levels. Within this

socioecological framework ID is defined a multidimensional state of human functioning tightly related to environmental demands, and must be necessarily understood and measured within the person's environment by considering all the sociocultural factors that may influence the persons functioning (culture, language, among others).

Through this lens, limitations in human functioning, or ID manifestation, is originated by a lack of adjustment between human functioning and environmental demands, and depends on the interaction of several closely intertwined dimensions of functioning: intellectual abilities, adaptive skills, health condition, participation and context (see Figure 1). Within this framework, the critical role of supports must be acknowledged. Supports, or strategies aiming to promote and enhance human functioning (Luckasson et al., 2002), act as mediators between the person functioning and environmental demands. Support needs, “a psychological construct referring to the pattern and intensity of supports necessary for a person to participate in activities linked with normative human functioning” (Thompson et al., 2009, p.135), are then reflective of the mismatch between the person functioning and environmental demands that has to be reduced by providing the person with the appropriate supports.

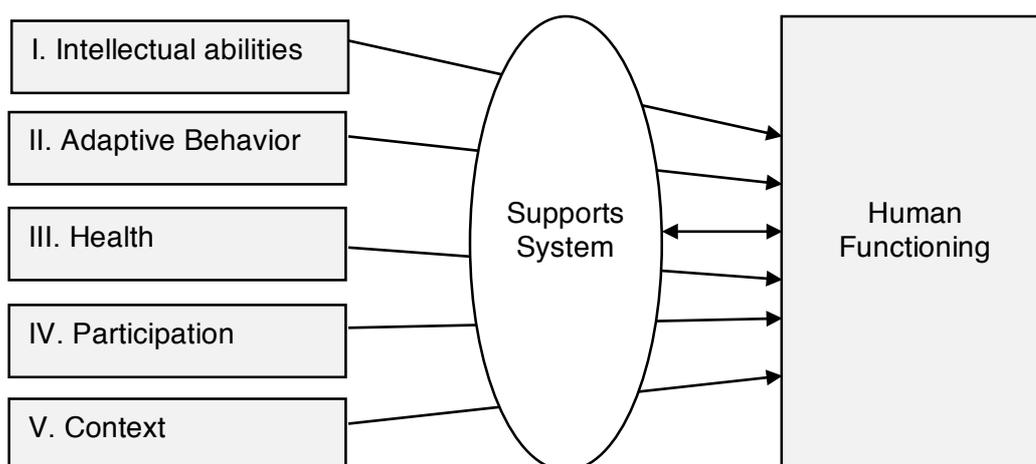


Figure 1. Conceptual framework of human functioning (extracted from Schalock et al., 2010, p. 14)

Recently though, research has called for a relevant shift towards the adoption of a holistic framework embracing and linking different perspectives (biomedical, psychoeducational, sociocultural and justice) to understand ID within a constitutive perspective. The biomedical perspective has traditionally focused on ID related physical and genetic factors, the psychoeducational perspective has emphasized all the learning related limitations associated with ID, whereas the sociocultural perspective highlights social shared beliefs of ID build upon the person with ID interaction with his or her context. Finally, the justice perspective demands that people with ID must be equally considered, legally treated and be provided with the same opportunities as other citizens. Importantly, researchers are positing that individually, these perspectives are not sufficient to comprehend the complexity of ID but put together, they can lay the foundations for a better and more complete understanding of ID and for an integrative prevention framework (Schalock, Luckasson, Tassé, & Verdugo, 2018).

## **1.2. Quality of life paradigm**

Despite the wide array of quality of life (QoL) models (e.g., Cummins, 2005), the model proposed by Schalock (1996), lately endorsed by a panel of experts (Schalock et al., 2002), will serve as a basis for this thesis framework. This model has mostly been used in the field of intellectual and/or developmental disabilities (IDD) both as a sensitizing notion and a unifying paradigm, and as a conceptual and measurement framework for program planning and evaluation. QoL is defined by a multidimensional desired state of personal well-being. This construct is composed of universal and culturally contextualized factors, objective and subjective components and is influenced by personal and environmental factors (Schalock & Verdugo, 2002/2003). Further, its cross-cultural validation (Jenaro et al., 2005; Wang, Schalock, Verdugo, & Jenaro, 2010) and empirical confirmation of its etic (universal) and emic (culturally related) properties (Schalock et al., 2005) makes it even more appropriate. This model acknowledges

several dimensions that have a positive impact on the lives of people with IDD, and that are summarized in Table 1.

Table 1.

*Factor structure of the QoL model (adapted from Wang et al., 2010)*

<b>Factor</b>	<b>Domain</b>	<b>Examples of indicators</b>
Independence	Personal development	Education, personal competence, performance
	Self-determination	Autonomy, goals and personal choices
Personal well-being	Emotional well-being	Contentment, self-concept and lack of stress
	Material well-being	Financial status, employment and housing
	Physical well-being	Health and health care, activities of daily living and leisure
Social Integration	Interpersonal relations	Interactions and relationships
	Social Inclusion	Community integration and participation, social supports
	Rights	Human and legal rights

Also, it must be noted that the conceptual model of QoL in which the present work is based embraces other components besides the above described QoL domains, such as moderator and mediator variables influencing QoL domains and enhancement strategies (Schalock, Verdugo, Gomez, & Reinders, 2016) that are closely intertwined. QoL domains are those factors constituting personal well-being and operationalized into quality of life indicators (see Table 1). Moderator and mediator variables are, in turn,

factors contributing to influence the person's interaction with his or her environment by altering (strengthening or weakening) or influencing the relationship variables. Finally, enhancement strategies involve approaches and resources aiming to promote personal QoL related outcomes and personal growth (Schalock et al., 2016). Researchers have recently claimed for the need to explore, in depth, mediator and moderator variables (Gómez, Peña, Arias, & Verdugo, 2016), as well as enhancement strategies that may influence people with IDD quality of life so as to inform resources and supports allocation and policies, among others.

QoL of people with IDD is also an integrative model composed by eight domains, which includes what individuals without disabilities typically understand as QoL. The core domains of QoL are assumed to be the same for all citizens, despite variations in value and importance (Schalock et al., 2010; Verdugo, Schalock, Keith, & Stancliffe, 2005). Recent research has posited the relevance of investigating and comparing the QoL of people with and without disabilities (e.g., Simões & Santos, 2016), to gain further understanding about how the presence of a disability impacts the perceived QoL. Further, this knowledge has the potential to inform the field on the QoL domains with more evident disparities amongst people with and without disabilities that urge to be addressed (Simões & Santos, 2016), towards fostering people with IDD inclusion and social equity. In this sense, the adoption of the QoL model has the potential to promote the transformation of professional policies and practices by emphasizing what is really important in the lives of people with IDD. Amongst the eight QoL domains, self-determination has been stated as a significant predictor of QoL (Lachapelle et al., 2005), life satisfaction (Shogren, Lopez, Wehmeyer, Little, & Pressgrove, 2006) and postschool outcomes of people with IDD (e.g., Shogren, Garnier-Villarreal, Lang, & Seo, 2017; Shogren, Wehmeyer, Palmer, Rifenbark, & Little, 2015). Self-determination status has also been related to positive academic and transition outcomes (e.g., Konrad, Fowler, Walker, Test, & Wood, 2007) and recreation outcomes (McGuire & McDonnell, 2008).

According to this, and given the crucial role of self-determination in promoting positive outcomes, component elements of self-determination, as well as contextual opportunities that stimulate self-determined actions across environments must be investigated in depth and appropriately assessed so as to guide the interventions decision-making processes towards enhancing people with IDD functioning.

### **1.3. Dissertation layout**

This doctoral thesis has been developed through the lens of the above displayed paradigms and is composed of several studies aiming to respond to the main objective: exploring the impact of environmental, specifically home and school, opportunities on self-determined actions in young people with and without disabilities. The theoretical framework embraces a brief overview of self-determination theories, self-determination assessment, promotion and related personal and environmental variables influencing self-determination. The first article (Mumbardó-Adam, Guàrdia-Olmos, Adam-Alcocer et al., 2017), in fact, has laid out the current state of the research literature analyzing self-determination and personal and contextual variables. Further, this article has highlighted the lack of literature reporting self-determination and personal and contextual data and thus claims for the importance of accurately reporting and including these variables in studies so as to better understand their role in self-determination expression. My contribution to this meta-analysis has been to jointly analyze the data with other two co-authors and to write down and lead the manuscript writing process.

Several articles have contributed to build this doctoral thesis results. The second article (Mumbardó-Adam et al., in press) presents the adaptation and validation to the Spanish language and context of the Self-determination Inventory: Scale Student Report (SDI:SR, Shogren et al., 2017), the first scale built to measure self-determination in young people with and without disabilities. As the paper stresses, though the validated measure has reported good validity and reliability properties, and has demonstrated to

be measuring the same construct both in adolescents with and without disabilities, further work was still needed to ensure that the same measure could be used in such a heterogeneous population. My contribution to this article has been to collect the data, jointly analyze the data with a co-author and to write down and lead the manuscript writing and edition process.

The third article (Mumbardó-Adam, Guàrdia-Olmos, Giné et al., 2017) has thus contributed to gain further knowledge of the scale robustness when measuring self-determination in adolescents and young adults with and without disabilities. Through the use of Item Response Theory techniques, this work has highlighted several areas for the measure improvement and to consider when administrating the instrument. My contribution to this article has been to collect the data, jointly analyze the data with a co-author and to write down and lead the manuscript writing and edition process.

A relevant issue to consider, given the target population of the SDI:SR, was the impact of disability when answering the SDI:SR. In the fourth article (Mumbardó-Adam, Guàrdia-Olmos, & Giné, 2018a), we demonstrate a weak impact of disability in self-determination, thus providing unique information about the underpinnings of measuring self-determination with the same tool in people with and without disabilities. My contribution to this article has been to collect the data, jointly analyze the data with a co-author and to write down and lead the manuscript writing and edition process.

The fifth article (Mumbardó-Adam, Guàrdia-Olmos, & Giné, 2018b) presents the validation to the Spanish language of a tool used to measure self-reported opportunities to engage in self-determined actions: the AIR Self-determination Scale (Wolman, Campeau, DuBois, Mithaug, & Stolarski, 1994). This is a major contribution as to date, available instruments in Spanish were focused on the self-determination essential characteristics of the person being assessed, but less attention was paid to his or her context despite the evidences suggesting its relevance in self-determination expression.

My contribution to this article has been to collect the data, jointly analyze the data with a co-author and to write down and lead the manuscript writing and edition process.

Overall, the psychometrical work above presented has set the bases to explore the impact of opportunities on self-determination expression in the sixth article (Mumbardó-Adam, Guàrdia-Olmos, & Giné, 2018c). We have proposed an integrative model to understand and disentangle the specific relationship amongst self-determination essential characteristics and contextual opportunities, adding thus to the self-determination construct understanding and shedding light for future research. My contribution to this article has been to collect the data, jointly analyze the data with a co-author and to write down and lead the manuscript writing and edition process.

Finally, the general discussion and limitations of this doctoral thesis are displayed and future research lines are also discussed.







# 02

## *THEORETICAL FRAMEWORK*

---



## 2.1 Overview of self-determination theories

The current understanding of self-determination construct is rooted in the long lasting philosophical debate around the cause of action: do we act based on our *free will* and volition or are our actions' causes *determined*? As Wehmeyer (2003a) displays in detail, within determinism, the soft-determinist line of thought posited that the cause of action it's somehow caused and volitional and that the agent is free to act, although his/her actions might be driven by his own perceptions and thoughts. With the emergence of the discipline of psychology, and specifically within the field of personality psychology, this debate shifted to the causes of human behavior. Precursors of personality psychology theories posited that organisms, although influenced by the world and environment they live in, can act with autonomous motivation as opposed of external-determination, that is with self-determination (Wehmeyer, 2003a). Since this first incursion in psychology discipline, the self-determination construct has been theorized and understood through other closely related disciplines such as motivational psychology with the emergence of the Self-determination Theory (SDT; Deci, 1992; Deci & Ryan, 2000), that will be in detail explained below. However, self-determination was not used in relation to people with IDD until the early seventies when Nirje (1972) in a chapter titled *The Right to Self-determination* first posited that "the road to self-determination is both difficult and all important for a person who is impaired" (Nirje, 1972, p. 177). With this statement, he thus emphasized the need to start considering people with disabilities as deserving to take part in decisions affecting their own lives, regardless the hindrances that, in doing so, practitioners and support providers, families and even people with disabilities themselves can encounter. Overall, he called for the right of people with IDD to take control over their own lives.

Since then, self-determination theories have emerged from research on intellectual and/or developmental disabilities, such as the *Functional Theory of self-determination* (Wehmeyer, 1999) which has been further developed and enhanced to

embrace people with and without disabilities in the newest theoretical framework *Causal Agency Theory* (Shogren, Wehmeyer, Palmer, Forber-Pratt, Little, & Lopez, 2015). Other theories such as the *Action Model for self-determination* (a recent revision from Field and Hoffman 1994's model for self-determination), the *Ecological Theory of self-determination* (Abery & Stancliffe, 2003) and the *Self-determined Learning Theory* (Mithaug, Mithaug, Agran, Martin, & Wehmeyer, 2002) have contributed to build on the self-determination construct understanding, although only those used in this thesis are further displayed in detail. While these theoretical frameworks have shed light into self-determination construct, they have also added to the understanding of what is not self-determination, contributing to avoid misunderstandings.

One broadly extended misperception of the self-determination construct is solely understanding it as a synonym of autonomous and independently performed behavior (Wehmeyer, 2005). This interpretation, first distorts the actual meaning of the construct that goes beyond autonomy, as self-determination is also composed of related constructs such as self-regulation or self-realization. Further, self-determination construct entails volition, that is autonomous or self-caused action based on one's preferences, which does not imply to act independently or without supports. Second, exclusively assuming self-determination to be independent action, excludes a wide array of youth from being self-determined due to their support needs. In this sense, people with ID themselves have acknowledged the crucial role of supports for expressing self-determination (Shogren & Broussard, 2011).

Self-determined actions can neither be equated solely to choice-making skills. Providing the person with the opportunity to make autonomous choices is just a part of engaging in self-determined actions (Wehmeyer, 2003b). Similarly, self-determination must not be understood as a set of skills the person has to manage, although some self-determined related skills (Wehmeyer, 2005), as problem-solving skills, can help operationalizing the construct. Acting in a self-determined manner implies using several

of these skills that allow the person to be the causal agent of what happens in his life, but is not reduced to just putting these skills into practice. Finally, self-determination is neither a process or an outcome delimited by specific contents or skills that must be learned, but is a trait, characteristic or disposition of the person that is expressed across contexts and is influenced by situational characteristics (Wehmeyer, 2005).

### **2.1.1 The Self-determination Theory**

SDT is primarily one of several theories of motivation that analyzes the origins and outcomes of human agentic action. SDT is based on the organismic paradigm or metatheory, that posits that humans are active organisms that are motivated to engage in self-realizing activities and exercise knowledge and capacities in their personal and social environments (Deci & Ryan, 2000). That is, in contrast with other theories biologically rooted, SDT defends that behavior does not only depend on biological contingencies or needs but that human action is motivated towards the fulfilment of psychological needs. In fact, according to SDT, a critical issue for causal action and, specifically, to act in service of a goal is related to people satisfaction of their basic psychological needs and attainment of their valued outcomes (Deci & Ryan, 2000). These psychological needs, namely competence, relatedness, and autonomy are essential to maintain intrinsic motivation towards causal action, and embody the “what” and “why” of goal pursuit, and encourage thus goal setting and attainment (Ryan & Deci, 2000). The need for competence is experienced when humans desire to master their contexts of life and to feel competent and proficient in those contexts. The need for autonomy is fulfilled when the person engages in volitional actions, experiences choice opportunities and those are aligned to the person’s preferences and interests. Lastly, the need for relatedness is satisfied when the person experiences a social belonging amongst a group, or a sense of connectedness with others (Ryan & Deci, 2000). Satisfying the above mentioned needs, according to SDT, mostly depends on supportive

environments that should offer opportunities for the person to take control of own actions, thus enhancing, among other outcomes, subjective well-being (Deci & Ryan, 2000).

The concepts of intrinsic motivation and psychological needs have laid the foundations of different fundamental theories that comprises and sustain SDT, and that explain diverse motivationally based phenomena in different contexts and situations (Deci & Ryan, 2011). The *Cognitive Evaluation Theory* explores intrinsic motivation development and specifically addresses the effects of social contexts on intrinsic motivation. The *Organismic Integration Theory* includes and acknowledges the relevance of extrinsic motivation as part of the continuum to navigate towards intrinsic motivation and defines different subtypes of extrinsic motivation along this continuum. The *Causality Orientations Theory* describes people's tendencies to initiate and regulate actions in various ways and contexts. The *Basic Psychological Needs Theory* further elaborates the concept of psychological needs and deepens in their impact on psychological health and well-being. The *Goal Content Theory* expands the "what" of goals pursuit and posits that when goals are intrinsically driven (e.g., personal growth and well-being) the three psychological needs are better satisfied. Finally, the *Relationships Motivation Theory* exposes why interpersonal relationships play a crucial role for people adjustment and well-being, and provides further insight into parents and children attachment theories, amongst others. Overall, these theories develop and strengthen SDT tenets by providing further insight and research based evidences on each essential component of the theory.

SDT has been framing research in multiple areas such as education, health care, organizations and work, physical activity and exercise, psychotherapy and counseling, and technology. Further, although SDT research has mainly focused on people without disabilities, emerging studies are making efforts to test and analyze the tenets of SDT amongst people with ID. For example, Frielink, Schuengel and Embregts (2018) examined, through a structural equation model approach, if a theoretical model based

on SDT would account for the observed variance amongst the following variables; autonomy support, need satisfaction, autonomous motivation, and subjective well-being; in people with ID. However, to the best of our knowledge, not a single study has gathered people with and without disabilities through SDT lens.

### **2.1.2 The functional theory of self-determination**

The functional theory of self-determination stems from the early work done by Wehmeyer (1992, 1999) and Wehmeyer, Kelchner and Richards (1996) and draws from previous research on theories of human agency and on self-determination as a motivational construct, such as framed in SDT. Contrarily to SDT though, the functional theory of self-determination is a personality theory and thus shifts the focus to the “how”, rather than the “why”, of self-determined actions. Under this theoretical framework, self-determination is defined as “acting as the primary causal agent in one’s life and making choices and decisions regarding one’s quality of life free from undue external influence or interference” (Wehmeyer, 1996, p. 24), thus defining self-determined actions or behaviors through the function they serve for the person. As derived from this definition, the concept of causal agency is central to this theory and therefore implies that a person purposely engages in actions to achieve an end. Briefly a causal agent makes things happen in his or her life (Wehmeyer, 2003b).

Self-determined actions are identified by four essential characteristics, namely autonomy, self-regulation, psychological empowerment and self-realization. Acting autonomously implies behaving without undue external influence, but based on personal interests. However, this statement must not be equated to acting in a self-centered manner, or independently without supports (Wehmeyer, 2003b). It rather means acting guided by own preferences, regardless of the supports one might need, and deciding if acting according to own interests in a specific situation is cautious enough and worthwhile. Self-regulation essential characteristic refers to adjusting own actions or

behaviors to work towards goal attainment. When a person self-regulates his or her actions, through the use of self-management strategies, he or she assesses actions, the degree to which these action are serving goal attainment functions and adjust them towards goals completion. Psychological empowerment enacts persons beliefs about their actions. As important are capacities and opportunities to act in a self-determined manner than the beliefs a person harbors about their proficiency in acting and achieving their goals. Self-determined actions are also self-realizing, in that persons act according to their strengths and thus capitalize on their knowledge about themselves (Wehmeyer, 2003b). These four essential characteristics that define self-determined actions emerge through the acquisition and development of diverse skills or component elements of self-determination which are summarized in Table 2. These component elements development begins in childhood, and thus must be supported by specific teaching strategies and, especially by providing children with tailored opportunities to practice those skills. In fact, though self-determination is primarily an adolescent and adult dispositional characteristic, its foundations and basic abilities that will allow for essential characteristics to develop must be promoted since early childhood (Shogren, Palmer, & Wehmeyer, 2017).

Table 2.

*Some component elements of self-determination*

<b>Component elements</b>	
Choice-making skills	Self-management skills (self-evaluation,
Decision-making skills	self-monitoring, self-instruction...)
Planning skills	Positive attributions of efficacy
Problem-solving skills	Self-advocacy and leadership skills
Goal-setting and goal-attainment skills	Self-knowledge and self-awareness

The functional theory of self-determination has framed the research in self-determination of people with disabilities in the last decades, mostly through the use of the Arc's Self-determination scale (Wehmeyer & Kelchner, 1995) a self-report measure based on this theoretical framework that assesses the four essential characteristics of self-determination. The research framed on this theory has addressed diverse issues along the last decades. Some of the most relevant contributions have been the operationalization of self-determination in people with intellectual disability, the exploration of the impact of individual and environmental characteristics on the self-determination expression of people with ID, and the development of self-determination promotion and assessment tools.

### **2.1.3 Causal Agency Theory**

Causal Agency Theory (CAT; Shogren et al., 2015) builds upon the functional model of self-determination (Wehmeyer, 1992, 1999; Wehmeyer, Kelchner, & Richards, 1996) and integrates recent advances in Positive Psychology and the strengths-based approach to define and understand IDD. Further, this newest framework incorporates and enhances previous research under the functional theory of self-determination in people with IDD. The growth of Positive Psychology research which has also lead to a burgeoning body of literature including people with disabilities (Shogren, Wehmeyer, Buchanan, & Lopez, 2006) and the emergent application of school wide universal interventions that benefit all students, for example under Multi-tiered Systems of Supports (MTSS), has drawn the attention to defining and promoting self-determination for all (Shogren, Wehmeyer, & Lane, 2016). There was the need thus to set the underpinnings of self-determination definition through the lens of an integrative theoretical framework. In this sense, Causal Agency Theory does not only reconceptualize the functional theory of self-determination but does also enhance its

understanding by integrating previous research done with the general population under SDT framework (Deci & Ryan, 2000).

Causal Agency Theory defines self-determination “as a dispositional characteristic manifested as acting as the causal agent in one’s life” (Shogren et al., 2015, p.257). Two crucial assumptions are, at least, derived from this definition. That self-determination is defined as a dispositional characteristic implies understanding it as a tendency to act in a certain way, that is a frame of reference through which a person evaluates a situation and acts accordingly. Importantly though, this personal tendency might not be wrongly assimilated to a static trait, but it is contrarily shaped by contextual variables both across and within individuals, as this disposition interacts with situational characteristics of contexts that can either propel or thwart self-determined actions. Further, and as for the functional theory of self-determination, causal agency stands as a key notion to understand the self-determination construct. A causal agent, as previously stated, is the one that causes things happen in his or her life. Self-determined actions act thus as catalyzers for causal agency, that is to accomplish a specific goal or end, as depicted in Figure 2.

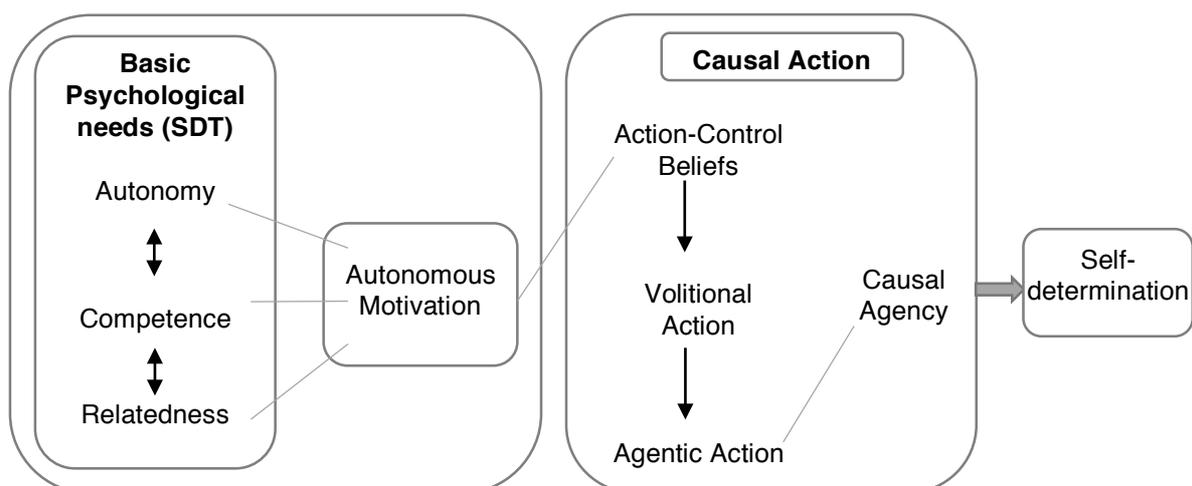


Figure 2. Theoretical model of self-determination development (extracted from Shogren, Little, & Wehmeyer, 2017, p.19)

Causal Agency Theory provides a framework to understand the development of self-determination, that is how people become self-determined and engage in self-determined actions, as illustrated in Figure 2. They basically do so to fulfill their basic psychological needs, namely autonomy, competence and relatedness as defined by SDT, by initiating a causal action sequence. Within this causal action sequence, contextual opportunities can either act as barriers or as enhancers of actions. These basic psychological needs stimulate autonomous motivation that, in turn, propels causal action. Specifically, CAT defines three essential characteristics of self-determined actions, namely volitional actions, agentic actions and action-control beliefs, that nurtures causal agency and that build upon and enhance those defined under the functional theory of self-determination. Table 3 depicts the correspondence amongst essential characteristics of self-determination under the two above mentioned theoretical frameworks as well as newly defined associated constructs.

Table 3.

*Essential characteristics and components constructs relationship amongst Causal Agency Theory and the functional theory of self-determination (extracted and adapted from Shogren et al., 2015, p. 260)*

<b>Essential Characteristics under CAT</b>	<b>Associated essential characteristics under functional theory of self-determination</b>	<b>Additional constructs incorporated in CAT essential characteristics</b>
Volitional Action	Autonomy	Self-initiation
Agentic Action	Self-regulation	Self-direction
		Pathways thinking
Action-control beliefs	Psychological Empowerment Self-realization	Control expectancy (agency beliefs, causality beliefs)

Under Causal Agency Theory then, self-determined action is embodied by three essential characteristics that define the action function in the service to a person's goals: (1) volitional action, (2) agentic action, and (3) action-control beliefs. Volitional action refers to the extent to which a person makes intentional, conscious choices based on individual preferences and interests, and is comprised of *autonomy* (acting based on preferences, interests, and abilities without undue influence) and *self-initiation* (initiating action to achieve a goal while using past experiences as a guide). Volitional actions propel causal capabilities (e.g., choice-making, planning skills...) whereas agentic actions activate the use of agentic capabilities (e.g., self-management skills, self-advocacy...). Agentic action involves self-directing and managing actions in service of a freely chosen goal and implies identifying different ways to solve a problem (*pathways thinking*), engaging in *self-directed* action, and managing and evaluating actions taken (*self-regulation*). In being engaged in volitional and agentic actions, people develop adjusted action-control beliefs about their own performance and abilities. Action-control beliefs include *control-expectancy*, that is believing one's skills and resources will enable goal attainment, *psychological empowerment* which implies believing that one has what it takes to reach a goal through effort, and *self-realization* which implies using self-knowledge of strengths and weakness to reach goals. When people act in a self-determined manner engaging in volitional and agentic actions mediated by action-control beliefs, they respond to environmental challenges (opportunities or threats) or act towards creating those challenges, thus propelling self-determination to develop. For this main reason, one of the first initiatives under CAT has been to develop an assessment tool (Shogren, Wehmeyer et al., 2017) to measure all adolescents and young adults, that is with and without disabilities, essential characteristics so as to inform interventions planning and instruction. However, and despite the key role of context in influencing self-determination expression, further work is needed to empirically disentangle its impact in propelling or thwarting self-determined actions as defined through CAT.

## **2.2. Self-determination assessment**

As previously stated, self-determination promotion has been related to personal, academic and post-school outcomes achievement, but also to an enhanced quality of life of adolescents with disabilities (e.g., McDougall, Evans, & Baldwin, 2010). An accurate and comprehensive assessment of a person's self-determination has the potential to inform and individualize intervention planning so as to guide the decision making processes to promote self-determination. For this reason, self-determination assessment has been a largely covered topic in the scientific literature, specially in the special education field. Further, as self-determination develops through the lifespan, special attention has been drawn to its assessment and promotion since early adolescence. Overall self-determination, self-determination related components and skills, and contextual variables assessment in school contexts becomes even more relevant as it stands as the first step to gain information that can be used to tailor self-determination instruction to the student needs, will, strengths and weaknesses. In parallel, self-determination measures are also needed to evaluate an instruction program efficacy and self-determination instruction, might be as well monitorized to support the teacher in their teaching task, providing valuable information regarding the student performance. Further, and perhaps more importantly, this continuous assessment might as well inform the student about his or her own achievements, weaknesses and strengths, and stands as a valuable tool to enhance student self-regulation, pathways thinking and self-knowledge. In fact, being aware of how we address challenges and opportunities to act in a self-determined way, as well as having repeated experiences of setting goals, planning their achievement and act, while regulating actions in service of the chosen goal, contributes to build the person's beliefs about him or herself and thus fosters personal self-knowledge. For this main reason, measures must be sensitive to

students' changes to serve self-determination learning and instruction (Field, Martin, Miller, Ward, & Wehmeyer, 1998).

Instruments developed to assess self-determination have been framed in the existent theories as they have operationalized the construct traced in these theories. Table 4 sketches an overview of the self-determination assessments and their theoretical framework of reference, the targeted population of each measure, the different versions of the instruments as well as the informants that are expected to answer. While a wide array of self-determination measures has been developed throughout last decades in US context, as Table 4 displays, within the Spanish context though, less attention has been drawn to self-determination assessment. First attempts to translate and adapt the Arc's Self-determination scale (Wehmeyer & Kelchner, 1995) to obtain a reliable and valid measure of Spanish students' self-determination (Gómez-Vela, Verdugo, Badía, González-Gil, & Calvo, 2010; Wehmeyer, Peralta, Zulueta, González-Torres, & Sobrino, 2006) held some limitations that a more recent work led by Verdugo, Vicente, Gómez-Vela and colleagues (2015) overcame. The ARC-INICO self-determination scale (Verdugo, Vicente, Fernández, Gómez-Vela et al., 2015) was developed and validated with 279 students with intellectual disability (Vicente, Verdugo, Gómez-Vela, Fernández, & Guillén, 2015) and demonstrated adequate psychometric properties. All the internal consistency coefficients, including the values obtained for the complete scale and for separate sections, were appropriate (higher than .80). Construct validity was determined by exploratory and confirmatory factor analyses, obtaining good fit indices (Verdugo, Vicente, Fernández, Gómez-Vela, & Guillén, 2015). This self-report instrument, which is aligned to the functional theory of self-determination (Wehmeyer, 1999), is the only reliable and robust measure, to date, to assess self-determination in Spanish adolescents and young adults with intellectual disability.

Table 4.

*Summary of self-determination theories and related assessments*

Theoretical framework	Assessment	Target population	Versions and informants
Self-Determination Theory (Deci, 1992)	<p>Dozens of instruments have been developed to assess different constructs contained within the theory. Some examples are:</p> <ul style="list-style-type: none"> <li>- The Basic Need Satisfaction scale (Deci &amp; Ryan, 2000)</li> <li>- The Aspiration Index (Kasser &amp; Ryan, 1996)</li> </ul>	Young adults and adults without disabilities	For the two instruments displayed as examples of measures developed within SDT, informants are the same persons being assessed.
Action model for self-determination (Field & Hoffman, 1994)	The Self-determination Assessment battery (Hoffman, Field, & Sawilowksy, 2004)	Adolescents and young adults with and without disabilities	This battery contains 5 instruments targeting different informants and multiple assessment methods. Educators must complete 1) an observation checklist and a 2) questionnaire assessing self-determination related skills, and 3) a questionnaire assessing the degree of completion of a curriculum based on Field and Hoffman (1994) theory and designed to promote self-determination related skills, the <i>Steps to Self-determination curriculum</i> (further explained

			below). Parents and students versions parallel the teachers' measures and assess self-determination related skills.
Ecological Theory of self-determination (Abery & Stancliffe, 2003)	Minnesota Self-determination Scales (Abery et al., 2000)	Adolescents and adults with IDD	Each subscale of this battery has two versions, one to be answer by the person being assessed and the other by an informant (parents or educators) close to the person.
Self-determined Learning Theory (Mithaug et al., 2002)	AIR Self-determination Scale (Wolman et al., 1994)	School-aged children and adolescents with IDD (but also normed with youth without disabilities)	This battery, further explained in the fifth article of this thesis, is composed of three versions: the student, the parent and the teacher versions which measure the student's capacities and opportunities to engage in self-determined actions.
Functional theory of self-determination (Wehmeyer, 1999)	The Arc's Self-determination Scale – Adolescent version (Wehmeyer & Kelchner, 1995) and its Short Form (Wehmeyer, Palmer, Shogren, & Seong, 2014)	Adolescents and young adults with IDD (the Short form was also normed with youth without disabilities)	These measures are self-reports to be answered by the person being assessed.

---

	The Arc's Self-determination Scale – Adult version (Wehmeyer & Bolding, 1995) and its Short Form (Shogren, Seo, Seong, & Wehmeyer, 2015)	Adults with IDD	
Causal Agency Theory (Shogren et al., 2015)	Self-determination Inventory (Shogren, Wehmeyer et al., 2017)	Adolescents and young adults with and without disabilities	This battery is currently composed by a self-report and a parallel version to be answered either by teachers, parents, or informants that reliably know the person being assessed.

---

Most of the measures above mentioned (Table 4) are self-reports that rely on the answers of the person being assessed. As self-determination assessment necessarily implies asking the persons being evaluated about their own perceptions of them acting as causal agents of their lives, measuring it with people with IDD may represent a challenge. Indeed, to measure self-determination, a construct mostly built and perceived individually, might imply respondents to have adequate communication skills and be judged by researchers to be able to provide reliable information (Finlay & Lyons, 2001). For this reason, interviewers must provide support for people with IDD to answer questionnaires and other types of measures to ensure questions comprehension. A certain flexibility in asking questions while maintaining standardized administration rules would also help when interviewing persons with IDD, specially those with ID (Hartley & MacLean, 2006). Paraphrases, expansions and providing examples are the most widely used supports to clarify the meaning and favor adolescents and adults with ID answers (Finlay & Lyons, 2001), though their use in self-determination measure can be compromising. Respondents might be asked to think broadly and generalize in the abstract instead of providing an answer tightly related to a specific situation and hardly generalizable to other situations, though they might also be asked about concrete actions and contexts. Due to the hindrances related with asking questions to people with ID, specific considerations might be taken into account when creating or validating measures directed to both people with and without IDD, such as analyzing the differential impact of the presence of ID in items responses, to avoid then concerns about validity.

Despite those challenges and threats, and as it can be seen in Table 4, most of the self-determination instruments have been normed with population with and without disabilities, though less have been specifically designed for people without disabilities, except for those emerging from SDT. However, mainly because of the challenges, above explained in detail, of assessing a person with IDD through a self-report measure, more attention needs to be paid to establish the validity of such measures with the specific

populations instruments are designed for (Finlay & Lyons, 2001). As true as instruments developed for the general population might be inappropriate for people with IDD, instruments developed for people with IDD might as well not be suitable for the general population. Further, norming a measure with a certain population does not necessarily imply the instrument to be thought and created for this population, that is, making the necessary changes and adaptations the specific population requires. For this main reason, further research must endeavor in developing appropriate assessments to be used with general population to facilitate assessment, for example, in inclusive settings.

Other ways to assess self-determination include asking to proxies, that is parents, teachers or other informants that closely know the person being assessed. In this sense, and although answers provided by others may be as well informative, differences and similarities in self-determination construct comprehension amongst informants must be explored, so as to ensure the construct is similarly understood for assessment purposes. Further, proxies can provide valid information about observable variables but they are more limited in responding about more subjective and less observable issues (Cummins, 2002). Literature suggests differences in teachers, parents and youth perceptions on the student self-determination. In a sample of students with emotional and behavioral disorders, intellectual disability and learning disabilities assessed with the AIR Self-determination scale (Wolman et al., 1994), Carter and colleagues (2010) found that teachers evaluated students' capacity for self-determination lower than their students did (Wilks's  $\Lambda = .82$ ,  $F(1, 192) = 43.67$ ,  $p < .001$ ), but higher than parents ( $F(2, 192) = 26.14$ ,  $p < .001$ ). Similar results were found in students with severe intellectual and developmental disabilities with teachers' rating the capacities of 135 students to act in a self-determined manner significantly higher than parents ( $t(90) = 3.54$ ,  $p = .001$ ,  $d = .43$ ) (Carter, Owens, Trainor, Sun, & Swedeen, 2009). As teachers and parents do not share and neither they are part of all their students and children's experiences, it might be challenging for them to assess youth capacities to engage in self-determined actions

across contexts. Besides, disparities in self-determination assessment can be found even amongst teachers, with general and special education teachers reporting differences in the importance devoted to teach some of the essential components of self-determination, specifically for self-advocacy ( $F(1, 304) = 10.36, p < .001$ ) and self-awareness ( $F(1, 304) = 8.52, p < .004$ ) (Carter, Lane, Pierson, & Stang, 2008), and special educators rating self-determination teaching importance higher than general educators ( $F(1, 862) = 5.83, p = .016, ES = 0.25$ ; Stang, Carter, Lane, & Pierson, 2009). Special education teachers seem to be more aware of the relevance of teaching self-determination related skills and its impact in students' school and postschool outcomes achievements. As exposed then, and considering the existing literature, further research is needed to understand other informants' comprehension and perceptions about self-determination, as its assessment can compromise the planned instruction and intervention.

### **2.3. Self-determination promotion**

While self-determination promotion is not the main focus of this dissertation, it is closely related to self-determination assessment, as exposed above, and adds to the construct development and comprehension. Self-determination component elements, as above explained, are observable and teachable skills and attitudes that operationalize essential characteristics of self-determination and emerge across the lifespan as children and adolescents learn and exercise those skills (Wehmeyer, 1999). Those skills and attitudes enable the person to act in a self-determined manner, and develop through the life-course, although its promotion in early childhood might facilitate these skills life-long development. Table 5 gathers essential characteristics and component elements of self-determination under CAT and a summary of useful teaching strategies to teach those component elements.

Table 5.

*Self-determination essential characteristics, component elements and related teaching strategies (adapted from “Self-determination Inventory,” n.d., and Wehmeyer & Shogren, 2017)*

<b>Essential characteristics</b>	<b>Teaching strategies</b>	<b>Component elements</b>
Autonomy	<ul style="list-style-type: none"> <li>- Infuse opportunities to explore different activities and develop preferences.</li> <li>- Provide opportunities for choice making.</li> </ul>	<p><u>Causal capabilities</u></p> <p>Choice making skills</p>
Self-initiation	<ul style="list-style-type: none"> <li>- Encourage action initiation, based on the evaluation of the best moment to act towards goal attainment.</li> <li>- Reflection amongst past experiences to guide present actions.</li> </ul>	<p>Independence skills</p> <p>Goal setting skills</p> <p>Problem-solving skills</p> <p>Planning skills</p>
Pathways thinking	<ul style="list-style-type: none"> <li>- To reflect upon potential costs and benefits of choices, setting the underpinnings of decision making skills.</li> <li>- Encourage ownership of challenges and solutions of problems.</li> <li>- Create opportunities to problem solve in natural environments and situations.</li> </ul>	<p><u>Agentic capabilities</u></p> <p>Problem solving skills</p> <p>Goal attainment skills</p> <p>Self-advocacy and leadership skills</p> <p>Self-management skills (self-instruction, self-monitoring, self-evaluation)</p>
Self-direction	<ul style="list-style-type: none"> <li>- Reflecting and learn from mistakes.</li> <li>- Analyzing contextual challenges and opportunities to decide to act or not.</li> <li>- Provide opportunities for leadership roles.</li> </ul>	

Self-regulation	<ul style="list-style-type: none"> <li>- Teaching self-monitoring and self-management skills.</li> <li>- Support and encourage goal setting and planning.</li> </ul>	
Control expectancy	<ul style="list-style-type: none"> <li>- Supporting and encouraging the creation of support networks in multiple contexts.</li> <li>- Reflecting on goals attained and plans and skills used to do so and identify areas of potential improvement.</li> </ul>	
Psychological empowerment	<ul style="list-style-type: none"> <li>- Teaching self-knowledge and self-awareness about strengths and weaknesses to set high but realistic expectations.</li> </ul>	<p>Self-awareness</p> <p>Self-knowledge</p>
Self-realization	<ul style="list-style-type: none"> <li>- Fostering the understanding and knowledge of strengths and support needs.</li> <li>- Encouraging the identification of personal and network supports and self-advocacy communication skills</li> </ul>	

In educational contexts, self-determination component elements as those presented in Table 5, can be taught at any tier of the Multi-tiered System of Supports an approach that merges embedded response to intervention and positive behavioral interventions and supports, as long as students are provided with opportunities to learn them. This approach systematizes academic, social and behavioral supports for all students and organizes a classroom or school students needs based on a three-tiered model of supports. The first tier involves universal teaching strategies and supports intended to address and prevent all students' needs. The second tier is intended to focus

on additional supports a small group of students might need to address their academic, social or behavioral needs, while the third tier is intended to provide specific students with higher support needs with pervasive and individualized supports (Gamm et al., 2012). Supports at tier 3 must only be offered when supports at tier 1 and 2 are ineffective to address students needs. As long as MTSS models are intended to address not only academic, but also social and behavioral needs, research has endeavored in the need to consider and foster college and career readiness skills (Morningstar, Lombardi, Fowler, & Test, 2017), which are certainly aligned with self-determination related skills. Setting accurate goals and planning its achievement, adapting goals to personal dreams but also to one's strengths and weaknesses and monitoring actions and adjusting them in service of freely chosen goals are just some examples of skills needed to achieve academic, social and behavioral purposes. Further, all students, that is with and without disabilities, might benefit from this learning, if these above-mentioned skills are taught at tier 1. For this main reason, MTSS models stand as a framework to teach transition skills, such as self-determination related skills, and foster greater personal outcomes to benefit all students and help them to navigate contextual challenges.

Self-determination related skills can then be taught at all three tiers, that is at a classroom, small group or individual level, and with all students (Shogren, Wehmeyer, & Lane, 2016). Specifically, research has shown that students with disabilities benefit from instruction on self-determination related components or skills and that they further use and apply these skills (e.g., Algozzine, Browder, Karvonen, Test, & Wood, 2001). In this sense, self-determination interventions focus either on a concrete component (e.g., planning skills), or on global self-determination through multicomponent interventions, that is interventions that address multiple component elements of self-determination simultaneously. Single component interventions focused on specific self-determination related skills such as choice making, problem solving, decision making or self-management, provide students with abilities to navigate and respond to contextual

demands. For example, literature suggests that students with IDD benefit from self-knowledge and self-awareness teaching and reflections (Campbell-Whatley, 2008), as they gain a deeper understanding and knowledge about their disabilities, strengths and weaknesses, which leads to a better adjustment of personal and academic goals and plans. Also, self-advocacy strategies instruction, such as teaching persuasive writing (e.g., with students with emotional and behavioral disorders, Cuenca-Sánchez, Mastropieri, Scruggs, & Kidd, 2012), might support students to let their voices, opinions and preferences be heard and to stand for their rights.

Further, by embedding learning opportunities throughout the day to practice and learn the above mentioned skills, students develop critical abilities for academic, transition and life success. For example, Glago and colleagues (2009) taught elementary students with intellectual disability to use problem solving skills in different scenarios, including home and school contexts and found significant differences ( $F(1, 18) = 21.46$ ,  $p < .001$ ) favoring the experimental group. Choice making instruction has also been related to significant decreases on problem behavior occurrence and parallel increases on adaptive behavior (Shogren, Faggella-Luby, Bae, & Wehmeyer, 2004). However, in a narrative meta-synthesis of the literature covering efforts to promote self-determination of students with disabilities, Cobb and colleagues (200) found that positive self-determination outcomes were maximized when multi-component interventions were used in contrast with single component interventions.

Multicomponent interventions are often facilitated through instruction programs or packages that target specific areas such as students with IDD involvement in mainstream education, transition planning or goal attainment. Some of these multicomponent curricula or programs developed for or used with students with disabilities are summarized in Table 6, as well as a brief description of their use and the targeted areas of instruction.

Table 6.

*Summary of self-determination instruction curricula and packages.*

Program	Brief description
<i>Whose Future Is It Anyway?</i> (Wehmeyer et al., 2004)	Student directed materials intended to teach skills to allow students to participate in transition-planning meetings at middle and high school levels.
<i>TAKE CHARGE for the future</i> (Powers et al., 1996)	Student directed materials to: 1) identify transition goals, 2) self-direct transition planning meetings, 3) use problem-solving, and self-regulatory strategies to achieve goals.
<i>The Self-Directed IEP</i> (SDIEP; Martin, Huber-Marshall, Maxton, Jerman, & Miller, 1996)	SDIEP is a module of the <i>ChoiceMaker Self-Determination Curriculum</i> (Martin & Marshall, 1995) targeting students' expression of personal goals. This package is intended to teach leadership skills to allow students to successfully self-direct their Individualized Education Plan (IEP) meetings.
<i>Steps to Self-determination Curriculum</i> (Field & Hoffman, 1996)	This curriculum is based on Field and Hoffman (1994) self-determination model and targets overall self-determination instruction by helping students develop the knowledge, beliefs, and skills to become more self-determined.
<i>Next S.T.E.P.</i> (Halpern, Herr, Doren, & Wolf, 2000)	This curriculum aims at teaching students to take charge of their own transition planning process and to assume responsibility for important life decisions by training students to select and implement transition goals (e.g., employment or personal life goals).

Unlike instruction curricula and packages, a model of instruction is an instruction plan intended to guide instruction and that can be infused across all types of curriculums (behavioral, academic...). The *Self-Determined Learning Model of Instruction* (SDLMI; Wehmeyer, Palmer, Agran, Mithaug, & Martin, 2000) is a multicomponent intervention to teach self-regulated problem skills in service of a chosen goal. This model can be used with students with and without disabilities, across ages, settings and content areas (Hagiwara, Shogren, & Leko, 2017). It is divided into three phases: 1) setting a goal, 2) taking action, and 3) adjusting the goal or plan. In each phase, students are confronted with a problem they need to solve by navigating, with teachers support, through successive questions which contribute to build the initial problem solution. The SDLMI allows thus for tailoring instruction according to students needs. Research largely supports the impact of SDLMI instruction on students self-determination enhancement (e.g., Wehmeyer, Palmer, Shogren, Williams-Diehm, & Soukup, 2013; Wehmeyer et al., 2012), on access to the general education curriculum (e.g., Lee, Wehmeyer, Palmer, Soukup, & Little, 2008), on academic and transition goal attainment (e.g., Shogren, Palmer, Wehmeyer, Williams-Diehm, & Little, 2012) and on teacher perceptions on students capacity and opportunities provided to engage in self-determined actions (Shogren, Plotner, Palmer, Wehmeyer, & Paek, 2014). The SDLMI has also been recently translated and adapted to Spanish (Mumbardó-Adam, Vicente, et al., 2017) in an effort to boost and spread its use.

Further, self-determination instruction has mainly been promoted in the Spanish context by *Plena Inclusión*, an institution devoted to people with ID. This institution has developed materials for families and professionals of adults with ID to sensitize them about the relevance of this construct as well as to facilitate self-determination promotion (e.g., Ponce, 2010). Besides, they have recently developed a guide for adopting inclusive practices such as teaching self-determination related skills, targeting students with and without disabilities (Etxabe et al., 2013). However, while research largely suggests that

students with disabilities benefit from self-determination interventions regardless of their disability severity (Algozzine et al., 2001; Malian & Nevin, 2002), less is known about students without disabilities, though recent research posits that they can benefit from this learning as well (Shogren, 2013; Shogren, Wehmeyer, & Lane, 2016), in line with MTSS postulates.

Also, despite the large body of literature dealing with self-determination promotion in school contexts, further research is needed in family contexts, as those are definitely crucial environments for the person to become self-determined. However, little is known about the role of families in enhancing their children self-determination (Wehmeyer, 2014), despite being critical components of self-determination learning through the lifespan. Further, the scarce research that has dealt with families and self-determination has focused in early childhood (e.g., Erwin et al., 2009), from which some practical knowledge have bourgeoned. Families have outlined the use of a variety of strategies that can potentially provide opportunities to promote their children self-determination in early ages. Fostering the child engagement within the home environment, offering opportunities for control and regulation of this environment and supporting the child self-esteem, are some of the strategies that can be infused in everyday routines (Brotherson, Cook, Erwin, & Weigel, 2008), though in other countries (e.g., Spain, Arellano & Peralta, 2013) they also acknowledge a lack of strategies and resources to promote self-determination with their children. In Spain, emerging research is revealing a tendency of families with children with ID ranging in age from early childhood to young adulthood to equal self-determination to autonomy or self-sufficiency (Arellano & Peralta, 2013), outlining thus a potential line for research and practice within the Spanish context. Practitioners and researchers must fight against this simplistic reductionism of the self-determination construct by working with families through a culturally responsive framework (Shogren & Turnbull, 2006). Within this context, parents also seem to struggle to find a balance between allowing their children to take risks and

protecting them, that is, deciding what is best for them without necessarily respecting their preferences (Arellano & Peralta, 2013).

Another critical component of families' systems that has also drawn little attention in scientific literature is the role of siblings of youth with IDD, though they clearly are lifelong companions that, more often than not, act as supports for their siblings with disabilities. A recent study held in Spain has emphasized the role of siblings on self-determination expression of youth with intellectual disability (Vicente-Sánchez et al., 2018). In fact, when the child with ID was the youngest sibling and had three or more siblings, higher levels of self-determination were reported, thus suggesting that older siblings might be better supporting self-determination learning, and being three or more siblings to teach and support their sibling with ID might be also facilitating self-determination expression (Vicente-Sánchez et al., 2018). However, further research is clearly needed to replicate these findings and explore ways 1) to elucidate effective ways to support families towards enhancing their children self-determination, and 2) to nurture a close collaboration with educational environments to enhance self-determination outcomes (Shogren & Turnbull, 2006). As Wehmeyer (p. 183, 2014) sensibly affirms "It's clearly not a question of "if" families matter; it is really a question of how best to support families to support their sons, daughters, and siblings with disability to learn skills, and have experiences that prepare them to solve the day-to-day problems that exist in adulthood."

#### **2.4. Self-determination and contextual factors**

As a psychological construct, self-determination is necessarily impacted and closely related to multiple contextual factors, both environmental and personal factors. In fact, the use of the "context" as an integrative concept refers to both personal and environmental variables that are immutable, such as age, gender, language culture or ethnicity, and can be viewed as independent variables; and other environmental

variables, named intervening variables, such as policies, organizations, and supports that can be changed towards functioning improvement (Shogren, Luckasson, & Schalock, 2014). Indeed, though self-determination as a psychological construct and dispositional characteristic can be expressed by every person independently of his/her race, ethnicity, culture and language, among others, self-determination operationalization can diverge according to the context of expression, as it interacts with situational characteristics.

All in all, self-determination must not be understood in isolation of the context where self-determined actions occur, but also must be comprehended across the various levels of the ecological system (microsystem, mesosystem and macrosystem) (Shogren, 2013). In acknowledging context as an integrative framework through which analyze factors that can have an impact, influence and be part of self-determination development, it becomes crucial to disentangle the effects of these contextual variables on self-determination expression and intervention (Wehmeyer et al., 2011) to inform the design and implementation of interventions to promote it. To address these issues and empirically begin this work, the first article of this thesis is a systematic review that analyzes the impact of some contextual variables on self-determination, according to the literature published in the last years, and provides an extended overview of personal and environmental variables that have been related to self-determination.

Mumbardó-Adam, C., Guàrdia-Olmos, J., Adam-Alcocer, A. L., Carbó-Carreté, M., Balcells-Balcells, A., Giné, C., & Shogren, K. A. (2017). Intellectual Disability Classification, Self-Determination and Context: A Meta-analytic study. *Intellectual and Developmental Disabilities, 55*(5), 303–314. <https://doi.org/10.1352/1934-9556-55.5.303>

*The article has been removed so as to respect the journal publishing policies.*



# 03

*OBJECTIVES*

---



The main aim of this doctoral thesis was mainly to explore the impact of contextual opportunities, namely home and educational contexts, on the self-determination expression of young people with and without disabilities, through CAT lens. Assessment tools to measure both opportunities and essential characteristics of self-determination in general population were not available in Spanish, nor adapted to the Spanish context. For this main reason, to achieve the main aim of this thesis, and after having explored the existent literature, we first adapted and realized a psychometric study of two self-determination measures for thus exploring the impact of contextual opportunities in self-determination essential characteristics. It must be noted that the first article of this doctoral thesis (Mumbardó-Adam, Guàrdia-Olmos, Adam-Alcocer et al., 2017) served as a point to tackle the empirical work done afterwards. Indeed, this systematic review laid down the underpinnings of the recent research on contextual variables related to self-determination expression.

Table 7 links the articles titles stemmed from each specific objective of this doctoral thesis. Specifically, the concrete objectives were:

1. Adapting to the Spanish language and context the SDI:SR (Shogren, Wehmeyer et al., 2017) and the AIR Self-determination scale (Wolman et al., 1994) for general population, that is with and without disabilities, of adolescents and young adults (aged 13 to 22).
2. Reporting further psychometric properties (items discrimination and differential functioning as a function of ID presence) of the SDI:SR (Spanish version) scores to inform the validation process.
3. Designing a model to explore the impact of opportunities provided in educational and familiar environments in self-determination of young people with and without disabilities.

Table 7.

*Summary of articles and their corresponding thesis' objectives.*

Objective	Article title
1	<ul style="list-style-type: none"> <li>- Psychometric properties of the Spanish version of the Self-Determination Inventory Student Self-Report: a Structural Equation Modeling Approach.</li> <li>- Assessing self-determination in youth with and without disabilities: The Spanish version of the AIR self-determination scale.</li> </ul>
2	<ul style="list-style-type: none"> <li>- The Spanish version of the Self-Determination Inventory Student Report: application to Item Response Theory to self-determination measurement.</li> <li>- Exploring the impact of disability on self-determination measurement.</li> </ul>
3	<ul style="list-style-type: none"> <li>- An integrative model of self-determination latent trait and related contextual variables.</li> </ul>







# 04

## RESULTS

---



## **4.1 Measuring the essential characteristics of self-determination: The Spanish version of the Self-Determination Inventory (SDI:SR)**

### *4.1.1 SDI:SR adaptation to Spanish context*

Mumbardó-Adam, C., Guàrdia-Olmos, J., Giné, C., Shogren, K. A. & Vicente, E. (in press). Psychometric properties of the Spanish version of the Self-Determination Inventory Student Self-Report: a Structural Equation Modeling Approach. *American Journal on Intellectual and Developmental Disabilities*.

LRF: SELF-DETERMINATION ASSESSMENT

RRF: C. Mumbardó-Adam

**Psychometric Properties of the Spanish Version of the *Self-Determination Inventory Student Self-Report*: A Structural Equation Modeling Approach**

*Cristina Mumbardó-Adam, Joan Guàrdia-Olmos, Climent Giné, Karrie. A. Shogren, and Eva Vicente*

**Abstract**

To date, instruments to measure self-determination have only been available in the Spanish language for adolescents with intellectual disability (ID). 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.

**Key Words:** *Causal Agency Theory, assessment, Self-Determination Inventory, adolescence*

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, et al., 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 of 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 one's 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, Wehmeyer, Little, and colleagues (2017) 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, Gómez-Vela, et al., 2015). Further, and perhaps more importantly, those instruments have only been validated with students with intellectual disability (ID) (Verdugo, Vicente, Fernández-Pulido, et al., 2015), leaving a large part of the youth population without access to a reliable self-determination tool.

## <2>Current Study

The purpose of this study was 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.

## <1>Method

### <2>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>

## <2>Instruments

**The Self-Determination Inventory: Student-Report (Spanish interim 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. pilot 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 (interim version) was then used in this study.

The SDI-SR American pilot version has demonstrated moderate model fit in measurement invariance ( $\chi^2(34) = 63.861$ , RMSEA = .075, CFI = .976, TLI = .960, SRMR = .038) in adolescents with and without disabilities (Shogren, Wehmeyer, & Little, 2017). However, with the self-regulation parcel being removed from the analysis, the model fit was found to be more satisfactory ( $\chi^2(22) = 36.472$ , RMSEA = .065, CFI = .988, TLI = .977, SRMR = .024). The Spanish-adapted version has the same structure as the U.S version, 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 ID

(Verdugo, Vicente, Fernández-Pulido et al., 2015; Vicente, Verdugo, Gómez-Vela, Fernández-Pulido, & 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 interim version).

## <2>Procedures

<3>**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 where 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 ID, 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 between 13 and 22 years of age 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 in age 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., 2017).

**<3>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 teachers could intentionally choose 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 9<sup>th</sup> and 12<sup>th</sup> grade, and universities were asked to select a 1<sup>st</sup>, 2<sup>nd</sup> or 3<sup>rd</sup> 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.

### **<2>Data Analysis**

The reliability of the scale was first assessed by examining internal consistency values, specifically Cronbachs' alpha. Self-regulation questions were discarded from 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., 2017). 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 interim 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, 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.

### **<1>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  $\chi^2$  to degrees of freedom ratio ( $\chi^2/df$ ), that are either acceptable ( $\chi^2/df < 5$ ), good ( $\chi^2/df < 3$ ), or excellent ( $\chi^2/df < 2$ ); the Comparative Fit Index ( $CFI \geq .90$ ); the Tucker Lewis Index ( $TLI \geq .90$ ); 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 ( $\chi^2 (945) = 2877.92$ ,  $p < .001$ ), though chi-square is usually highly influenced by large effect sizes (Hooper, Coughlan, & Mullen, 2008). However, the value of the ratio of  $\chi^2$  by degrees of freedom; which stands as a reasonable index for global fit (Byrne, 2013), especially 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 ( $\chi^2/df = 2.823$ ,  $CFI = .986$ ,  $TLI = .991$ ,  $SRMSR = .03$ ,  $RMSEA = .06$ ,  $BIC = -124121.1$ ,  $AIC = -123672.1$ ) 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 interim 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 interim 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 ( $\chi^2/df = 1.511$ , 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 interim 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 interim 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., 2017). 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., 2017). Concurrent validity was also established with the ARC-INICO Self-determination scale. SDI:SR (Spanish interim 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 ( $\chi^2(22) = 36.472$ ,  $\chi^2/df = 1.658$ ; RMSEA = .065, CFI = .988, TLI = .977, SRMR = .024) (Shogren, Wehmeyer, Little, et al., 2017). 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 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 domain operationalizing what the person thinks he/she can do, suggests that in adolescents 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, although it has only been validated with students with ID. However, due to the lack of available measures in Spanish language for adolescents with disabilities other than ID 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 for the poor reliability scores, particularly since 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., 2017). Some of the autonomy items are also based on examples of concrete situations, as for the self-regulation domain. These particular situations are then less prone to be overlaid across other contexts, and thus responses to these items may strongly depend on the adolescent previous exposure and engagement in those

situations. Items forming the 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 mimic 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 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 interim 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., 2017). The SDI:SR (Spanish interim version) stands then as a psychometrically strong measure to operationalize Causal Agency Theory in Spanish speaking populations<sup>1</sup>. Given the statistically significant differences in scores, further work is needed to determine if different normative standardized scores are needed to assess youth with and without disabilities with the same instrument. While 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, further work is needed to examine items discrimination patterns,

---

<sup>1</sup> The SDI:SR (Spanish interim version) used in this study is available upon request by contacting the first author.

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 fields will have access to a reliable measurement tool validated in Spanish language to assess self-determination in youth with and without disabilities. The SDI:SR (Spanish interim 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 interim 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.

### References

- Asparouhov, T., & Muthén, B. (2009). Exploratory structural equation modeling. *Structural Equation Modeling, 16*(3), 397–438. Doi:10.1080/10705510903008204
- Cascallar, E., Boekaerts, M., & Costigan, T. (2006). Assessment in the evaluation of self-regulation as a process. *Educational Psychology Review, 18*, 297-306. DOI

10.1007/s10648-006-9023-2

- Byrne, B. M. (2013). *Structural equation modeling with Mplus: Basic concepts, applications, and programming*. New York: Routledge.
- Field, S. & Hoffman, A. (1994). Development of a model for self-determination. *Career Development for Exceptional Individuals*, 17(2), 159-169.  
<https://doi.org/10.1177/088572889401700205>
- Field, S. & Hoffman, A. S. (2012). Fostering self-determination through building productive relationships in the classroom. *Intervention in school and clinic*, 48(1), 6-14. <https://doi.org/10.1177/1053451212443150>
- Hoffman, A., & Field, S. (2006). *Steps to Self-Determination*. (2<sup>nd</sup> ed.). Austin TX: PRO-ED.
- Hoffman, A., Field, S., & Sawilowsky, S. (2015). *Self-determination assessment-internet (SDA<sub>i</sub>). User's manual*. Trinity, Florida: Early Education Group.
- Hooper, D., Coughlan, J., & Mullen, M. R. (2008). Structural equation modeling: guidelines for determining model fit. *Electronic Journal of Business Research Methods*, 6(1), 53-60.
- Hu, L., & Bentler, P. M. (1999). Cutoff criteria for fit indexes in covariance structure analysis: Conventional criteria versus new alternatives. *Structural Equation Modeling*, 6(1), 1-55. doi.org/10.1080/10705519909540118.
- Muthén, L. K., & Muthén, B. O. (2012). *Mplus. The comprehensive modelling program for applied researchers: User's guide*, 5. Los Angeles: Muthén & Muthén.
- Platt, J., & Spivack, G. (1989). *The MEPS procedure manual*. Philadelphia: Hahnemann University, Department of Mental Health Sciences.
- Ryan, R. M., & Deci, E. L. (2000). Self-determination theory and the facilitation of intrinsic motivation, social development, and well-being. *American Psychologist*,

55(1), 68-78. <https://doi.org/10.1037/0003-066X.55.1.68>

- Shogren, K. A., Wehmeyer, M. L., & Lane, K. L. (2016). Embedding interventions to promote self-determination within multi-tiered systems of supports. *Exceptionality, 24*(4), 213-224. doi.org/10.1080/09362835.2015.1064421
- Shogren, K. A., Wehmeyer, M. L., Little, T. D., Forber-Pratt, A. J., Palmer, S. B., & Seo, H. (2017). Preliminary validity and reliability of scores on the Self-Determination Inventory: -Student report version. *Career Development for Exceptional Individuals, 40*(2), 92-103. doi:10.1177/2165143415594335
- Shogren, K. A., Wehmeyer, M. L., Palmer, S. B., Forber-Pratt, A. J., Little, T. D., & Lopez, S. (2015). Causal agency theory: Reconceptualizing a functional model of self-determination. *Education and Training in Autism and Developmental Disabilities, 50*(3), 251-263. [https://doi.org/10.1007/978-94-024-1042-6\\_5](https://doi.org/10.1007/978-94-024-1042-6_5)
- Tassé, M., & Craig, E. M. (1999). Critical issues in the cross-cultural assessment of adaptative behaviour. In R. L. Schalock (Ed.), *Adaptative behaviour and its measurement: Implications for the field of mental retardation* (pp. 161-184). Washington, DC: American Association on Mental Retardation.
- Verdugo, M. A., Gómez-Vela, M., Badia, M., González-Gil, F., & Calvo, I. (2009). Evaluación de la conducta autodeterminada de alumnos de educación secundaria con necesidades educativas específicas y sin ellas. In M. A. Verdugo, T. Nieto, B. Jordán de Urrés and M. Crespo (Coords.) *VII Jornadas científicas de investigación sobre personas con discapacidad. Mejorando resultados personales para una vida de calidad* (pp. 541-554). Salamanca: Amarú.
- Verdugo, M. A., Vicente, E., Fernández-Pulido, R., Gómez-Vela, M., Wehmeyer, M. L., & Guillén, V. (2015). A psychometric evaluation of the ARC-INICO Self-Determination Scale for adolescents with intellectual disabilities. *International*

*Journal of Clinical and Health Psychology*, 15(2), 149-159. doi:

10.1016/j.ijchp.2015.03.001

Verdugo, M. A., Vicente, E., Gómez-Vela, M., Fernández-Pulido, R., Wehmeyer, M. L.,

Badia, M., González-Gil, F., & Calvo, M. I. (2015). *Escala ARC-INICO de*

*Evaluación de la Autodeterminación: Manual de aplicación y corrección.*

Salamanca: INICO.

Vicente, E., Verdugo, M. A., Gómez-Vela, M., Fernández-Pulido, R., & Guillén, V.

(2015). Propiedades psicométricas de la Escala ARC-INICO para evaluar la autodeterminación. *Revista Española de Orientación y Psicopedagogía*, 26(1),

8-24. doi: 10.5944/reop.vol.26.num.1.2015.14339

Wehmeyer, M. L. (1992). Self-determination and the education of students with mental retardation. *Education and Training in Mental Retardation*, 27, 302 - 314.

Wehmeyer, M. L. (1995). *The Arc's self-determination scale: Procedural guidelines.*

Silver Springs, MD: The Arc of the United States.

Wehmeyer, M. L., & Kelchner, K. (1995). *The Arc's self-determination scale.* Silver

Springs, MD: The Arc of the United States.

Wehmeyer, M. L., Kelchner, K., & Richards, S. (1996). Essential characteristics of self-determined behaviors of adults with mental retardation and developmental

disabilities. *American Journal on Mental Retardation*, 100, 632-642.

Wehmeyer, M. L., Peralta, F., Zulueta, A., González Torres, M. C., & Sobrino, A.

(2006). *Escala de autodeterminación personal ARC Instrumento de valoración y guía de aplicación: Manual Técnico de la adaptación española.* Madrid: CEPE.

---

Received 2/25/2017, accepted 7/31/2017

---

*The Secretariat of Universities and Research of the Business and Knowledge Department of the Government of Catalonia [Secretaria d'Universitats i Recerca del Departament d'Economia i Coneixement de la Generalitat de Catalunya] and the Social European Funds supported this work with the predoctoral fellowship [2016FI\_B00253]. The author guarantees that no financial interest or benefit arises from the direct applications of this research.*

**Authors:**

**Cristina Mumbardó-Adam**, Facultat de Psicologia, Ciències de l'Educació i de l'Esport Blanquerna, Universitat Ramon Llull. Barcelona, Spain; **Joan Guàrdia-Olmos**, Departament de Psicologia Social i Psicologia Quantitativa. Facultat de Psicologia. Institut de Neurociències. Institute of Complex Systems (UBICS), Universitat de Barcelona, Spain; **Climent Giné Giné**, Facultat de Psicologia, Ciències de l'Educació i de l'Esport Blanquerna, Universitat Ramon Llull. Barcelona, Spain; **Karrie A. Shogren**, University of Kansas, Beach Center on Disability and Kansas University Center on Developmental Disabilities, Lawrence, KS, USA; and **Eva Vicente Sánchez**, Facultat de Educació, Universidad de Zaragoza, Spain.

Correspondence concerning this article should be addressed to Cristina Mumbardó-Adam, Facultat de Psicologia, Ciències de l'Educació i de l'Esport Blanquerna. Universitat Ramon Llull, Cister, 34, 08022 Barcelona, Spain. (e-mail: cristinama6@ Blanquerna.url.edu).

POST-PRINT

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

POST-PRINT

Table 2  
*Demographic information of the participants with disabilities*

	Students with disabilities	
	<i>N</i>	%
<i>School setting</i>		
Special education school	341	91.9
General education school	30	8.1
<i>Grade</i>		
9 <sup>th</sup> grade	84	22.64
10 <sup>th</sup> grade	137	36.93
12 <sup>th</sup> grade	3	0.81
Vocational training programs	116	31.26
Transition to adult life programs	31	8.36
<i>Disability type</i>		
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							
	$\chi^2$	DF	Ratio	CFI	TLI	AIC	BIC	SRMSR
A	2745.02	945	2.904	.964	.955	-	-	.05 (.04 - .06)
B	2893.12	945	3.061	.959	.949	-	-	.05 (.04 - .06)

POST-PRINT

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		
<i>Second Order Factors</i>			
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: \*  $p < .001$

POST-PRINT

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: \*  $p < .001$

POST-PRINT

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: \*  $p < .001$

POST-PRINT

Table 8  
*Fit Indices of CFA Models of Students With and Without Disabilities Samples*

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

POST-PRINT

#### *4.1.2 Exploration of SDI:SR scores psychometric properties*

Mumbardó-Adam, C., Guàrdia-Olmos, J., Giné, C., Raley, S. K., & Shogren, K. A. (2017). The Spanish version of the Self-Determination Inventory Student Report: application to Item Response Theory to self-determination measurement. *Journal of Intellectual Disability Research*. <https://doi.org/10.1111/jir.12466>

*The article has been removed so as to respect the journal publishing policies.*

#### 4.1.3 *The impact of disability in self-determination measurement*

Mumbardó-Adam, C., Guàrdia-Olmos, J., & Giné, C. (2018a). Exploring the impact of disability on self-determination measurement. *Research in Developmental Disabilities*, 78, 27-34. <https://doi.org/10.1016/j.ridd.2018.04.022>

*The article has been removed so as to respect the journal publishing policies.*

#### **4.2 Measuring opportunities to engage in self-determined actions: The Spanish version of the AIR Self-determination Scale**

Mumbardó-Adam, C., Guàrdia-Olmos, J., & Giné, C. (2018b). Assessing self-determination in youth with and without disabilities: The Spanish version of the AIR self-determination scale. *Psicothema*, 30(2), 238-243.  
<https://doi.org/10.7334/psicothema2017.349>

## Assessing self-determination in youth with and without disabilities: The Spanish version of the AIR self-determination scale

Cristina Mumbardó-Adam<sup>1</sup>, Joan Guàrdia-Olmos<sup>2</sup> and Climent Giné<sup>1</sup>

<sup>1</sup> Universidad Ramon Llull and <sup>2</sup> Universidad de Barcelona

### Abstract

**Background:** Acting in a self-determined manner, that is, using problem-solving or decision-making strategies, strongly depends on the opportunities the person is given to do so by the context. In fact, context can either facilitate or thwart the opportunities of adolescents and young adults for self-determined action, though there is, to date, a lack of instruments within the Spanish context to assess these opportunities. **Method:** This study aims to address this need by adapting and validating the AIR self-determination scale to the Spanish context with a sample of young Spanish people with and without disabilities. **Results:** The results showed acceptable psychometric properties of validity and reliability, and stressed differences in school and home opportunities for developing self-determination depending on the presence or absence of disability. **Conclusions:** The Spanish version of the AIR self-determination scale stands as a psychometrically robust instrument to assess capacities and opportunities for acting in a self-determined manner in all young people. Implications based on the differences in contextual opportunities arising from the presence of disability are also further discussed.

**Keywords:** Self-determination, contextual opportunities, assessment, adolescents with and without disabilities.

### Resumen

**La evaluación de la autodeterminación en jóvenes con y sin discapacidad: la versión española de la escala de autodeterminación AIR.** **Antecedentes:** actuar de forma autodeterminada, es decir, usando estrategias como la resolución de problemas o la toma de decisiones no solo depende de la persona que actúa. Si bien sabemos que el contexto puede ejercer como facilitador u obstaculizador de la acción de jóvenes y adolescentes, disponemos de pocos recursos, en contexto español, para su evaluación. **Método:** este estudio pretende dar respuesta a la escasez de recursos evaluativos que indagan en el papel que el contexto ejerce en el desarrollo de estas habilidades adaptando y validando la escala de autodeterminación AIR al contexto español en jóvenes con y sin discapacidad. **Resultados:** los resultados muestran unas características psicométricas de fiabilidad y de validez aceptables, y señalan diferencias en las oportunidades de las que disponen los jóvenes para actuar, en contexto escolar y familiar, en función de la presencia, o no, de discapacidad. **Conclusiones:** la versión española de la escala de autodeterminación AIR se erige como instrumento psicométricamente sólido para evaluar las capacidades y oportunidades para actuar de manera autodeterminada en todos los jóvenes. Se discuten también las implicaciones de las diferencias halladas en las oportunidades contextuales en función de la presencia de discapacidad.

**Palabras clave:** autodeterminación, oportunidades, contexto, evaluación, adolescentes con y sin discapacidad.

Self-determination as a psychological construct has been traditionally defined from the special education field. Research within this field has documented that adolescents with disabilities (e.g., learning disabilities and emotional and behavioral disorders; Pierson, Carter, Lane, & Glaeser, 2008) are less self-determined than their peers without disabilities, thus emphasizing the need to promote self-determination. Besides, self-determination has also been related to successful academic and transition outcomes (e.g., Konrad, Fowler, Walker, Test, & Wood, 2007) and a higher quality of life (e.g., Nota, Ferrari, Soresi, & Wehmeyer, 2007). Self-determination-related skills are, however, as relevant for persons

with disabilities as for others (Shogren, López, Wehmeyer, Little, & Pressgrove, 2006), though little is known about self-determination in people without disabilities, especially in comparison to their peers with disabilities.

Learning to solve problems, to engage in decision-making processes, to set and achieve goals based on one's own interests and preferences and to plan, assess and adjust actions to reach these goals are some of the skills related to self-determination. These develop throughout childhood and adolescence as long as the child/adolescent is exposed to situations that foster opportunities to act in a self-determined manner. Self-determination must be then understood from its interactive nature, in line with the most recent definition of the construct that describes it as a "dispositional characteristic manifested as acting as the causal agent in one's life" (Shogren et al., 2015, p. 258). Defining self-determination as a dispositional characteristic that develops according to the supports and opportunities available in each situation to use the self-determination-related skills implies acknowledging that self-

Received: September 30, 2017 • Accepted: January 22, 2018  
Corresponding author: Cristina Mumbardó-Adam  
Facultad de Psicología, Ciencias de la Educación y del Deporte (FPCEE) Blanquerna  
Universidad Ramon Llull  
08022 Barcelona (Spain)  
e-mail: cristinama6@blanquerna.url.edu

determined action depends on the context that can either propel or thwart its occurrence and further development.

The impact of opportunities on the development of self-determination has largely been documented (e.g., Carter, Owens, Trainor, Sun, & Swedeen, 2009), thus emphasizing the need to teach and promote self-determination-related skills. A first step to spread and promote the professionals' awareness of the need to explicitly teach self-determination-related skills implies providing them with reliable measurement and intervention tools to guide their interventions. The *Self-Determined Learning Model of Instruction* (Wehmeyer, Palmer, Agran, Mithaug, & Martin, 2000) is a widely used teaching model based on a goal-setting and attainment structure that intends to foster self-determination-related skills and guide self-determination interventions, and it was recently adapted and translated into Spanish (Mumbardó-Adam, Vicente et al., in press). Though this model is commonly used across curricular goals (e.g., improving the student involvement in general education curriculum), its potential embraces other non-academic contexts where the person can set, plan and achieve a goal. In terms of measurement instruments, the *Arc's Self-Determination Scale* (SDS; Wehmeyer & Kelchner, 1995) and the *American Institute for Research Self-Determination Scale* (AIR; Wolman, Campeau, DuBois, Mithaug, & Stolarski, 1994) are the most used and spread assessment tools.

Though both instruments measure global self-determination, they are rooted in different theoretical frameworks. The SDS is framed in the functional theory of self-determination (Wehmeyer, 2003) that defines an action as self-determined depending on the function that the action serves for the person. The AIR is rooted in self-determined learning theory (Mithaug, Mithaug, Agran, Martin, & Wehmeyer, 2003), which is based on the interaction between the person's capacities and the available opportunities to act in a self-determined manner. These capacities include both the skills to act towards achieving personal goals, and the person's perceptions about personal self-determination-related skills. The opportunities, in turn, are expected to occur in the school and family contexts, where they learn to plan, assess and adjust their thoughts and actions to ultimately develop the skills and abilities related to self-determination. Previous research (Shogren et al., 2008) has stressed that the AIR assesses different elements than instruments rooted in the functional model of self-determination that seem to measure self-determination status at a specific time. The AIR explores how opportunities provided at school and at home support students with disabilities to engage in self-determined actions (e.g., Carter et al., 2009; Pierson et al., 2008).

Within the Spanish context, initiatives to adapt and validate self-determination measurement tools must be noted. The ARC-INICO (Verdugo et al., 2015), which is rooted in the functional theory of self-determination, has been validated with adolescents with intellectual disability, and the Self-Determination Inventory (Shogren et al., 2017), based on a reconceptualization of the functional model, has actually been validated with adolescents with and without disabilities (Mumbardó-Adam, Guàrdia-Olmos, Giné, Shogren, & Vicente, 2017). However, none of those instruments allow for an in-depth exploration of the role of the context in propelling or thwarting self-determined action. For this reason, the purpose of this paper is to respond to this need by validating the AIR into Spanish to provide practitioners with a complimentary instrument that addresses the shortcomings of those that only measure personal self-determination. Also,

considering the relevance of self-determination-related skills for every person, in this study we opted to follow the work by Shogren et al. (2017) and validate the AIR-S with all the adolescents, not only with those with disabilities, to whom all self-determination measurement tools have been traditionally addressed. For this reason, though the main purpose of this study is to validate the Spanish version of the AIR-S, a subsequent objective is to explore differences in the AIR-S dimensions distributions between adolescents with and without disabilities. Concretely, this study intends to answer the following research questions:

- 1) Which is the reliability and validity psychometric evidence that allows us to validate the Spanish version of the AIR-S?
- 2) Are there empirical differences between self-determined capacities and opportunities in school and family contexts based on the presence of disability?

## Method

### Participants

Participants were intentionally recruited from schools or universities across different regions of Spain. Data was collected from 620 middle-school and high-school youths: 371 (59.8%) were students with disabilities either 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. Most of the participants were from Spain (79.3%), and the rest were from

Table 1  
Demographic information of the participants

	With		Without	
	N	%	N	%
Gender (male)	243	65.5	117	47
<i>School setting</i>				
Special education school	341	91.9	–	–
General education school	30	8.1	249	100
<i>Grade</i>				
9 <sup>th</sup> grade	84	22.64	54	21.7
10 <sup>th</sup> grade	137	36.93	41	16.5
12 <sup>th</sup> grade	3	0.81	32	12.8
Vocational training programs	116	31.26	40	16.1
Transition to adult life programs	31	8.36	–	–
University/College	–	–	82	32.9
<i>Disability type</i>				
Intellectual Disability	342	92.2	–	–
Mild	119	34.8	–	–
Moderate	149	43.57	–	–
Severe	74	21.63	–	–
ADHD	59	15.9	–	–
Learning Disability	116	31.27	–	–
Visual and Hearing Impairment	22	5.93	–	–
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	–	–
Motor Impairment	13	3.5	–	–
Two or more disabilities	223	60.1	–	–

Latin America (10.8%) and Eastern European (1.8%), West Asian (2.6%) and African countries (5.5%). On average, the students' ages ranged from 13 to 22 years ( $M = 16.86$ ;  $SD = 2.06$ ), the majority being male (58.1%). Detailed demographic information is provided in tables 1 and 2.

### Instruments

The AIR-S measures a person's capacities and opportunities for self-determination and is available in Student, Educator, and Parent versions. For the purpose of this study, the Spanish online student version form was used, which has 24 questions divided into two scales that gather data on the students' self-reported capacities and opportunities to engage in self-determined actions. The Capacity scale is in turn divided into two subscales and covers questions about the students' (1) *ability* related to self-determination and (2) *perceptions* about performing self-determined actions. The Opportunity scale is also composed of two subscales that measure (1) the students' perceptions of their *opportunities at home* to perform self-determined actions and (2) *opportunities at school*. Scores are rated on a Likert scale from 1 (Never) to 5 (Always). The AIR has been extensively used and has demonstrated adequate test-retest reliability (.74 after 3 months) and a strong internal consistency (Cronbach's alpha ranging from .89 to .99). In terms of validity, the original authors conducted a factor analysis that supported a four-factor structure explaining 74% of the instrument variance (Mithaug et al., 2003).

### Procedure

#### Translation, adaptation and pilot test

Tassé and Craig's (1999) guidelines were followed to adapt the AIR-S Spanish version. Two official translators translated the instrument independently into Spanish and discrepancies between the translations were resolved to develop one initial version of the scale. Then, a back translation was performed which showed that the final translation reflected the content of the original questionnaire. Five experts (researchers and professionals) assessed this translated version for items' clarity, importance and suitability. All the comments were analyzed and discussed by the authors until common agreement was reached. Few modifications of the scale were made, such as rewording some generic nouns to improve comprehension (e.g., avoiding synonyms of the word 'goal').

After the experts' changes were implemented, a pilot study was performed to test this instrument's preliminary version. In total, 114 youths participated in the study; 55 (48.2%) were students with disabilities and 59 (51.8%) were students without

disabilities. In terms of disability label, 26 (47.3%) students were reported to have mild intellectual disability and 26 (47.3%) were classified as having moderate intellectual disability. Additionally, three students (5.4%) were also diagnosed with Autism Spectrum Disorder. On average, students were 17 years old ( $M = 17.36$ ;  $SD = 2.70$ ), ranging from 13 to 22, the majority being female (66.7%). Students answered the AIR-S (Spanish version) in a self-report format, although the teachers and the first author provided support (i.e., item clarification) when needed.

An analysis of the item-subscale correlation matrix was performed to identify low-discrimination items (below .30). All items showed significant item-subscale correlations higher than .40, the lowest (.430) and highest (.778) correlation being found within the Perceptions subscale. The items' internal consistency was also checked, resulting in Cronbach's alpha ranging from .680 for Ability to .848 for Opportunities at school, with a .696 value for the whole scale. Results of the pilot test demonstrated empirical evidence of acceptable psychometric indexes, and this version was used in the field test.

### Field test

General education schools, universities and special schools spread throughout Spain were intentionally contacted. To be included in this study, schools needed an Internet connection, since the self-determination survey was administered online. Out of the 48 schools contacted, 6 general education schools, 4 universities, and 21 special schools agreed to participate in the study. Regarding student selection, different procedures were followed for students with and without disabilities. For students with disabilities, a sample of the questionnaires was sent to schools, so that teachers could intentionally choose students with disabilities who could render reliable information when answering the questions if support was provided. For students without disabilities, general education schools were asked to select a class between 9<sup>th</sup> and 12<sup>th</sup> grade, and universities were asked to select a 1<sup>st</sup>, 2<sup>nd</sup> or 3<sup>rd</sup> year class. Once potential participants had been selected, consent from the parent or the participant, if they were of legal age, was obtained. Students were provided as much time as needed to complete the scale. Teachers were explained the items' meanings and response system as well as how to support the scale administration. Students could be provided with different kinds of supports such as: facilitating access to information (i.e., reading the questions) and understanding and interpreting the questions (i.e., giving synonyms for misunderstood words).

### Data analysis

To answer the first study objective, the reliability of the scale was first assessed through internal consistency by calculating Cronbach's alpha. The ordinal reliability coefficient was also calculated to confirm the scale internal consistency, as Cronbach's alpha – albeit the most used reliability estimation within the psychology field – assumes the response items to be continuous. Specifically, the theta coefficient was calculated – a reliability estimation based on the eigenvalues extracted from a principal component analysis was calculated following Amor's (1974) estimation procedures. Secondly, construct validity was examined using confirmatory factor analyses (CFA) with the first- (Ability, Perceptions, Home and School) and second- (Capacities and Opportunities) order

Table 2  
Participants' age by gender and disability detailed description

Age	Gender		Disability	
	Male	Female	With	Without
13-14	42 (11.6%)	39 (15%)	45 (12.1%)	36 (14.5%)
15-16	136 (37.8%)	69 (26.5%)	130 (35%)	75 (30.1%)
17-18	120 (33.3%)	83 (32%)	140 (37.7%)	63 (25.3%)
19-20	55 (15.3%)	47 (18%)	52 (14.1%)	50 (20.1%)
21-22	7 (2%)	22 (8.5%)	4 (1.1%)	25 (10%)

factor structures. As items were measured in an ordinal response scale and the variances of the items' distributions were unequal, a Weighted Least Squares solution was used to analyze model fit estimations. Thirdly, configural invariance was established to assert that the same latent construct was measured across students with and without disabilities. Finally, regarding the second research objective, differences between the means of adolescents with and without disabilities were finally explored for the four first-order factors through a t-test analysis. All the analyses were performed with the whole sample of participants (i.e., with and without disabilities) and using the IBM SPSS statistical package .22 and Mplus software (5.0) (Muthén & Muthén, 2012).

### Results

In response to the first research question, which focused on exploring psychometrical properties of the AIR-S (Spanish version) to validate it into the Spanish context, the instrument's reliability and validity were examined. Internal consistency values obtained through Cronbach's alpha yielded acceptable values for the following subscales: Ability (.717) and Perceptions (.763). In turn, they yielded good values for Opportunities at School (.769) and at Home (.847) subscales. Higher order constructs showed good Cronbach's alpha values too: Opportunities (.862) and Capacities (.846). The theta coefficient was calculated for the whole scale (.925) and showed a higher value than the whole scale Cronbach's alpha (.880).

Construct validity was analyzed through a CFA. Although to date a complete consensus about goodness-of-fit indexes interpretation is still lacking, Hu and Bentler (1999) recommendations were followed for model fit interpretation. The  $\chi^2$  to degrees of freedom ratio ( $\chi^2/df$ ), which are either acceptable ( $\chi^2/df < 5$ ), good ( $\chi^2/df < 3$ ), or excellent ( $\chi^2/df < 2$ ); the Comparative Fit Index ( $CFI \geq .90$ ); the Tucker Lewis Index ( $TLI \geq .90$ ); and the Root Mean Square Error of Approximation ( $RMSEA < .06$ ) were considered for model fit interpretation. The values obtained showed an acceptable model fit ( $CFI = .982$ ,  $TLI = .962$ ,  $RMSEA = .043$ ), except for the chi-square test, which was statistically significant ( $\chi^2 (247) = 1561.89$ ,  $p < .001$ ), though chi-square is usually highly influenced by large effect sizes (Hooper, Coughlan, & Mullen, 2008). Also, the value of the ratio of  $\chi^2$  by degrees of freedom ( $\chi^2/gf$ ) was 6.3. Although lower values for the  $\chi^2/gf$  index would have been more adequate, this result was still under reasonable value ranges. Standardized factor loadings of first- and second-order factors and items are shown in Table 3.

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 ( $CFI = .910$ ,  $TLI = .991$ ,  $RMSEA = .031$ ,  $\chi^2/gf = 2.5$ ), and all item factor loadings were very similar between groups (i.e., students with and without disabilities), further purporting the presence of measurement invariance between groups.

In response to the second research question, differences between the first-order-factor latent means of students with and without disabilities were probed. Significant differences were not found in the Ability ( $t(597) = -.937$ ,  $p = .349$ ) and Perceptions ( $t(585) = -1.068$ ,  $p = .286$ ) dimensions, as opposed to both Opportunities dimensions. Significant differences were found in favor of participants with disabilities at School ( $t(618) = 5.093$ ,  $p < .001$ ), as opposed to Home ( $t(618) = -2.739$ ,  $p = .006$ ), with significant differences favoring participants without disabilities.

*Table 3*  
Standardized factor loadings from the confirmatory factorial analysis

	Ability	Perceptions	School	Home
Item 1	.709			
Item 2	.693			
Item 3	.738			
Item 4	.767			
Item 5	.660			
Item 6	.731			
Item 7		.815		
Item 8		.864		
Item 9		.827		
Item 10		.809		
Item 11		.758		
Item 12		.700		
Item 13			.836	
Item 14			.912	
Item 15			.878	
Item 16			.896	
Item 17			.870	
Item 18			.838	
Item 19				.896
Item 20				.916
Item 21				.892
Item 22				.921
Item 23				.888
Item 24				.886
<i>Second-order factors</i>				
Capacities	.962	.992		
Opportunities			.927	.870

Note: All factorial loadings:  $p < .001$

### Discussion

The present study aimed to validate the Spanish version of the AIR-S and to explore differences in the dimensions' distributions between adolescents with and without disabilities. Firstly, statistical estimators of reliability and construct validity corroborated an acceptable internal consistency, as well as a good fit of the second-order factor structure tested. Measurement invariance was also established between groups, thus confirming that the AIR-S measures the same construct in youths with and without disabilities. Secondly, as opposed to the Capacities dimension, significant differences were found in the Opportunities dimension in favor of participants with disabilities in the school context and in favor of participants without disabilities in the family context.

The Spanish version of the AIR-S obtained acceptable internal consistency values (Cronbach's alpha from .717 to .847). While the original version of the scale obtained higher internal consistency indexes (Cronbach's alpha from .89 to .99; Mithaug et al., 2003), the present study results align with other validations of the instrument such as the Chinese version (Cronbach's alpha from .70 to .83; Wong, Wong, Zhuang, & Liu, 2017), only validated with youths with intellectual disability. In both adapted versions, higher values are reported for the Opportunities subscales in comparison with the Capacities subscales, with Opportunities at home obtaining higher Cronbach's alpha values (.847 for the Spanish version and

.83 for the Chinese version). The Spanish results also confirmed the four first-order-factor and two second-order-factor structures supporting the original scale structure. The goodness-of-fit indexes aligned with Wong et al. (2017) values, too (CFI = .933, TLI = .926, RMSEA = .041).

Though informative, these results are not exempt from some limitations. To date, there is no measure in Spanish to assess contextual opportunities to develop self-determined actions for youths with and without disabilities with which to compare the results or establish concurrent validity. However, this particularity represents an added value to the study, too. Furthermore, when interpreting the results, it should be taken into account that the participants' disabilities, age and gender were not proportionally represented within the sample. Validating the AIR-S into Spanish with youths with and without disabilities adds to the newest and innovative approaches within the field of intellectual and developmental disabilities that promote universal assessment and intervention initiatives that target all youths, limiting exhaustive and individual interventions for students with higher support needs (Shogren, Wehmeyer, & Lane, 2016). In this sense, though future research must endeavor in establishing standardized norms for the Spanish version of the AIR-E, having a validated tool to use with all youths and making it accessible for professionals and institutions nurtures the need to collect significant information about how the person values the context as a propelling or hindering factor. A recent review of self-determination studies has stressed the scarcity of available research providing empirical data about the person's context, thus concluding that no general assumptions can be drawn from past research (Mumbardó-Adam et al., 2017), and that further evidence based on empirical data is needed to explore the context role in self-determination promotion.

That participants with disabilities report having fewer opportunities at home than their non-disabled peers to act in a self-determined manner might emphasize parental overprotection towards children with disabilities, thus limiting their opportunities to act, make mistakes and adjust their actions based on their own experiences. Parents have been found to rate their children with disabilities skills lower than teachers (Carter et al., 2009), thus nurturing the youths' perceptions about the lack of opportunities at home. Also, that youths with disabilities report having more opportunities than their peers without disabilities in the school

context highlights the lack of explicit teaching of skills related to self-determination in mainstream environments, though further research including participants without disabilities is needed to nurture this body of knowledge (e.g., assessment implications, differences and similarities with students with disabilities). Everyone uses these skills on a daily basis, but they are too often taken for granted for youths without disabilities while they would undoubtedly benefit from this learning (Shogren et al., 2016). Future research must compare teachers', parents' and youths' perceptions, as aligning them has the potential to share needs and adjust expectations and supports towards teaching self-determination-related skills.

The presence of significant differences between youths with and without disabilities with regard to their perceptions of opportunities but not in the capacities strengthens the relevance of assessing the context to plan tailored interventions. In parallel, recent studies (Mumbardó-Adam, Guàrdia-Olmos et al., in press) found no significant differences in the beliefs of youths with and without disabilities about their self-determination capacities. Future research should then focus on exploring the mediating role that the person's beliefs about their actions play in contextual opportunities and their self-determined actions (Wehmeyer, Shogren, Little, & López, 2017). The beliefs that students assume about their abilities directly influence their school performance (Yeager & Dweck, 2012). When youths believe that their skills can be improved, they develop a self-efficacy sense that allows them to face and respond to challenges and opportunities. Empirical evidence on the role of beliefs in self-determination development has the potential to inform intervention programs on building empowerment beliefs, self-knowledge and adjusted expectations that promote, in turn, the use of self-determination-related skills, as long as the context renders them opportunities to do so.

#### Acknowledgements

This work has been funded by *Secretaria d'Universitats i Recerca del Departament d'Empresa i Coneixement de la Generalitat de Catalunya* [Universities and Research office of the Business and Knowledge department of Catalonia Government] and the Social European Funds with the predoctoral fellowship [2017FI\_B100115].

#### References

- Amor, D. J. (1974). Theta reliability and factor scaling. In H. Costner (Ed.), *Sociological methodology* (pp. 17-50). San Francisco: Joseey-Bass.
- Carter, E. W., Owens, L., Trainor, A. A., Sun, Y., & Swedeen, B. (2009). Self-determination skills and opportunities of adolescents with severe intellectual and developmental disabilities. *American Journal of Intellectual and Developmental Disabilities, 114*(3), 179-192. <https://doi.org/10.1352/1944-7558-114.3.179>
- Hooper, D., Coughlan, J., & Mullen, M. R. (2008). Structural equation modeling: Guidelines for determining model fit. *Electronic Journal of Business Research Methods, 6*(1), 53-60. ISSN 1477-7029.
- Hu, L., & Bentler, P. M. (1999). Cutoff criteria for fit indexes in covariance structure analysis: Conventional criteria versus new alternatives. *Structural Equation Modeling, 6*(1), 1-55. [doi.org/10.1080/10705519909540118](https://doi.org/10.1080/10705519909540118).
- Konrad, M., Fowler, C. H., Walker, A. R., Test, D. W., & Wood, W. M. (2007). Effects of self-determination interventions on the academic skills of students with learning disabilities. *Learning Disabilities Quarterly, 30*(2), 89-113. <https://doi.org/10.2307/30035545>
- Mithaug, D. E., Mithaug, D. K., Agran, M., Martin, J. E., & Wehmeyer, M. L. (Eds.) (2003). *Self-determined learning theory: Construction, verification, and evaluation*. Mahwah, NJ: Lawrence Erlbaum Associates, Publishers.
- Muthén, L. K., & Muthén, B. O. (2012). *Mplus. The comprehensive modelling program for applied researchers: User's guide, 5*. Los Angeles: Muthén & Muthén.
- Mumbardó-Adam, C., Guàrdia-Olmos, J., Adam-Alcocer, A. L., Carbó-Carreté, M., Balcells-Balcells, A., Giné, C., & Shogren, K. A. (2017). Intellectual Disability Classification, Self-Determination and Context: A Meta-analytic study. *Intellectual and Developmental Disabilities, 55*(5), 303-314. [doi: 10.1352/1934-9556-55.5.303](https://doi.org/10.1352/1934-9556-55.5.303)

- Mumbardó-Adam, C., Guàrdia-Olmos, Giné, C., Shogren, K. A., & Vicente, E. (in press). Psychometric properties of the Self-Determination Inventory: Student Report (Spanish version): A structural equation modeling approach. *American Journal on Intellectual and Developmental Disabilities*.
- Mumbardó-Adam, C., Vicente, E., Giné, C., Guàrdia-Olmos, J., Raley, S. K., & Verdugo, M. A. (2017). Promoviendo la autodeterminación en el aula: el Modelo de Enseñanza y aprendizaje de la autodeterminación [Promoting self-determination skills in the classroom: The Self-Determined Learning Model of Instruction]. *Siglo Cero*, 48(2). doi:10.14201/scero20174824159
- Nota, L., Ferrari, L., Soresi, S., & Wehmeyer, M. L. (2007). Self-Determination, Social Abilities and the Quality of Life of People With Intellectual Disability. *Journal of Intellectual Disability Research*, 51, 850-865. doi:10.1111/j.1365-2788.2006.00939.x
- Pierson, M. R., Carter, E. W., Lane, K. L., & Glaeser, B. C. (2008). Factors influencing the self-determination of transition-age youth with high-incidence disabilities. *Career Development for Exceptional Individuals*, 31(2), 115-125. http://dx.doi.org/10.1177/0885728808317659
- Shogren, K. A., López, S. J., Wehmeyer, M. L., Little, T. D., & Pressgrove, C. L. (2006). The role of positive psychology constructs in predicting life satisfaction in adolescents with and without cognitive disabilities. An exploratory study. *The Journal of Positive Psychology*, 1, 37-52. https://doi.org/10.1080/17439760500373174
- Shogren, K. A., Wehmeyer, M. L., & Lane, K. L. (2016). Embedding interventions to promote self-determination within multi-tiered systems of supports. *Exceptionality*, 24(4), 213-224. doi.org/10.1080/09362835.2015.1064421
- Shogren, K. A., Wehmeyer, M. L., Little, T. D., Forber-Pratt, A. J., Palmer, S. B., & Seo, H. (2017). Preliminary validity and reliability of scores on the Self-Determination Inventory-Student Report Version. *Career for Development and Transition for Exceptional Individuals*, 40(2), 92-103. doi: 10.1177/2165143415594335
- Shogren, K. A., Wehmeyer, M. L., Palmer, S. B., Forber-Pratt, A. J., Little, T. D., & López, S. (2015). Causal agency theory: Reconceptualizing a functional model of self-determination. *Education and Training in Autism and Developmental Disabilities*, 50(3), 251-263.
- Shogren, K. A., Wehmeyer, M. L., Palmer, S. B., Soukup, J. H., Little, T. D., Garner, N., & Lawrence, M. (2008). Understanding the construct of self-determination: Examining the relationship between The Arc's Self-Determination Scale and the American Institute for Research Self-Determination Scale. *Assessment for Effective Instruction*, 33, 94-107. doi:10.1177/1534508407311395
- Tassé, M., & Craig, E. M. (1999). Critical issues in the cross-cultural assessment of adaptive behaviour. In R. L. Schalock (Ed.), *Adaptive behaviour and its measurement: Implications for the field of mental retardation* (pp. 161-184). Washington, DC: American Association on Mental Retardation.
- Verdugo, M. A., Vicente, E., Fernández-Pulido, R., Gómez-Vela, M., Wehmeyer, M. L., & Guillén, V. (2015). A psychometric evaluation of the ARC-INICO Self-Determination Scale for adolescents with intellectual disabilities. *International Journal of Clinical and Health Psychology*, 15, 149-159. https://doi.org/10.1016/j.ijchp.2015.03.001
- Wehmeyer, M. L. (2003). A functional theory of self-determination: Definition and categorization. In M. L. Wehmeyer, B. Abery, D. Mithaug & R. Stancliffe (Eds.), *Theory in self-determination: Foundations for educational practice* (pp. 174-181). Springfield: Thomas Publishing Co.
- Wehmeyer, M. L., & Kelchner, K. (1995). *The Arc's self-determination scale*. Silver Springs, MD: The Arc of the United States.
- Wehmeyer, M. L., Kelchner, K., & Richards, S. (1996). Essential characteristics of self-determined behaviors of adults with mental retardation and developmental disabilities. *American Journal on Mental Retardation*, 100, 632-642.
- Wehmeyer, M. L., Palmer, S. B., Agran, M., Mithaug, D. E., & Martin, J. E. (2000). Promoting causal agency: The Self-Determined Learning Model of Instruction. *Exceptional Children*, 66, 439-453. doi: 10.1177/001440290006600401
- Wehmeyer, M. L., Shogren, K. A., Little, T. D., & López, S. J. (2017). *Development of self-determination through the life-course*. Springer: Netherlands.
- Wolman, J. M., Campeau, P. L., DuBois, P. A., Mithaug, D. E., & Stolarski, V. S. (1994). *Air Self-Determination Scale and User Guide*. Columbia: American Institutes for Research.
- Wong, P. K. S., Wong, D. F. K., Zhuang, X. Y., & Liu, Y. (2017). Psychometric properties of the AIR Self-determination Scale: The Chinese version (AIR SDS-C) for Chinese people with intellectual disabilities. *Journal on Intellectual Disability Research*, 61(3), 233-244. doi: 10.1111/jir.12343
- Yeager, D.S., & Dweck, C. S. (2012). Mindsets That Promote Resilience: When Students Believe that Personal Characteristics Can Be Developed. *Educational Psychologist*, 47(4), 302-314. https://doi.org/10.1080/00461520.2012.722805

### **4.3 Impact of contextual opportunities on self-determination**

Mumbardó-Adam, C., Guàrdia-Olmos, J., & Giné, C. (2018c). An integrative model of self-determination latent trait and related contextual variables. *Manuscript submitted for publication.*

## **An integrative model of self-determination latent trait and related contextual variables**

### **Abstract**

Self-determination, as a dispositional characteristic of a person acting as the causal agent of his life, is indeed influenced by situational characteristics that shape actions across contexts. Research has also reported differences in self-determination levels and expression as a function of some personal factors such as the presence of intellectual disability, but there is a need to integrate this knowledge in a general model aiming to analyze the impact of contextual variables in people with and without disabilities. To address this need, an integrative model of self-determination and related contextual factors was tested through a structural equation modeling approach. Participants were 591 young people with and without intellectual disability (ID) that reported their perceptions on self-determination dimensions and opportunities provided to act as causal agents. Results indicated that both educational and family contexts impact self-determination expression and provided further understanding on self-determination dimensions' entity and function. Concretely, in youth without ID, contexts influenced different self-determination essential characteristics, thus emphasizing the lack of common work and collaboration. Several relevant implications for self-determination measure, comprehension and promotion derived from this study are discussed.

**Keywords:** Self-determination, family context, school context, intellectual disability

## **An integrative model of self-determination latent trait and related contextual variables**

A wealth of scientific evidence supports the idea that people act throughout their lives to fulfill their needs and achieve personal and valued outcomes across various contexts and life domains. According to the Self-determination Theory (SDT; Ryan & Deci, 2000), people act in ways that satisfy their basic psychological needs: (1) autonomy, which involves experiencing the will of choice, (2) competence in pursuing desired outcomes while feeling empowered to do so, and (3) relatedness, which implies interacting and feeling close and connected to one's environment. These psychological needs stimulate the person's motivation toward action (Deci & Ryan, 2012) to reach personal outcomes and further enhance personal growth and well-being. People's actions toward meeting the abovementioned psychological needs propels autonomous motivation development. Motivation, in turn, stimulates causal action through interaction with environmental opportunities or threats. Causal action, or how motivated people engage in causal actions, is further developed within the causal agency theory (CAT) framework (Shogren et al., 2015). In fact, while SDT lays the foundation to comprehend why people act in a self-determined way, the causal agency theory embodies how people engage in causal actions (Shogren, Wehmeyer & Palmer, 2017). Causal Agency Theory (CAT; Shogren et al., 2015) advances the work done with young people with disabilities within the functional theory of self-determination (Wehmeyer, 1999; Wehmeyer, Kelchner, & Richards, 1996) framework to align it with Ryan & Deci's (2000) work with the general population.

This newest theoretical framework defines self-determination as involving three constructs or essential characteristics: volitional actions, agentic actions, and action-control beliefs. The interplay between autonomous motivation and environmental

challenges directly encourages action-control beliefs that mediate volitional and agentic actions (Shogren, Little, & Wehmeyer, 2017). Action-control beliefs involve psychological empowerment, control over expectancies, and engagement in actions that may lead to self-realization. A person's self-knowledge of his or her own capacities, abilities, and supports are necessary to shape those beliefs and drive a person's actions toward reaching his or her goals by engaging in volitional and agentic actions.

Volitional action refers to making an intentional and autonomous choice based on one's interests without undue external influence. Agentic action implies acting in service of a freely chosen goal by directing and adjusting actions and managing opportunities and hindrances as they occur. These three components are operationalized into strategies or component elements of self-determination, which are the observable components of self-determined actions. Engaging in decision-making and problem-solving processes, self-managing and self-regulating actions and plans, and setting and achieving goals are examples of self-determined skills that enable people to cope with environmental demands and challenges and to navigate toward personal goals and outcomes. In this sense, self-determination is defined as a "dispositional characteristic manifested as acting as the causal agent in one's life" (Shogren et al., 2015, p. 258). As a dispositional trait, self-determined actions and related strategies fundamentally relate to the person's disposition and personal characteristics (i.e., motivation, ability), which is the frame of reference through which a person assesses and reacts to a situation. Dispositional traits are put into action across contexts, being narrowly intertwined with situational characteristics that shape individual differences when acting in a self-determined manner.

In this sense, research has explored the impact of some personal factors in self-determination expression. Young people with intellectual disability tend to report lower

levels of self-determination than their peers without cognitive impairments (e.g., Shogren et al., 2007; Wehmeyer & Garner, 2003), though researchers have also advised that environmental factors, such as exposure to self-determination instruction, are more important than personal factors, such as age and IQ, in predicting self-determination (Karvonen, Test, Wood, Browder, & Algozzine, 2004; Wehmeyer & Palmer, 2003). However, further research is clearly needed, as a recent review of the impact of personal differences in the relationship between intellectual disability and self-determination has shown some personal variables, such as gender and disability label, as key variables in understanding self-determination expression, but has also drawn the attention on the lack of research on contextual factors and their impact on self-determination expression (Mumbardó-Adam et al., 2017).

As dispositional constructs, such as self-determination, are not isolated factors but are closely intertwined with situational characteristics, the role of the context must be acknowledged and further studied to understand the interplay amongst personal traits and contextual variables. Both SDT and CAT, along with other precursor theories, acknowledge the role of context in thwarting or propelling self-determined actions (Deci & Ryan, 2008, Shogren et al., 2007; Shogren, Wehmeyer, & Palmer, 2017). The need to satisfy one's own psychological needs expands across all environments where the person interacts (e.g., family, acquaintances, school, and work; Milyavskaya & Koestner, 2011). Research on people with disabilities has reported the impact of family and educational opportunities on the development of self-determined actions (e.g., Carter, Owens, Trainor, Sun, & Sweden, 2009; Vicente-Sánchez, Guillén-Martín, Verdugo-Alonso, & Calvo-Álvarez, 2018), though less research has focused on people without disabilities. Adolescents with disabilities in Spain have reported to be offered more opportunities to engage in self-determined actions at school but less at home, as

compared with their peers without disabilities (Mumbardó-Adam, Guàrdia-Olmos, & Giné, 2018). Differences in Spanish youth regarding self-determination dimensions have also been established, with adolescents with disabilities reporting lower scores on volitional and agentic actions (Mumbardó-Adam, Guàrdia-Olmos, Giné, Shogren, & Vicente, in press), though no differences were found in the action-control beliefs domain. Considering then the partial results previously outlined, a general model that includes the described effects is necessary to obtain a representational model of the direct, indirect, and complex effects related to self-determination according to the conceptual and empirical definitions presented.

### **A structural equation model approach to self-determination and related variables relationship**

For this reason, we propose an integrative model (Figure 1) to describe how this theoretical framework can be operationalized in a unique model with young people with and without intellectual disability. To date, this is the first study that empirically analyzes the impact of contextual opportunities in self-determination-related constructs as measured through the Causal Agency Theory. To this aim, this model deepens the impact of contextual opportunities in predicting the self-determination essential characteristics in young people with and without intellectual disability to build upon the current knowledge of recent studies. Family and school contexts, which provide opportunities to engage in causal action impact and enhance self-determination (e.g., Carter et al., 2009), and the promotion of self-determination in those contexts are nurtured when efforts are done collaboratively (e.g., Kim & Park, 2012, Shogren & Turnbull, 2006). These contexts stimulate action-control beliefs, volitional actions, and agentic actions expression. While the relationship amongst these three self-determination dimensions has not yet been empirically established within CAT

framework, and although it seems plausible that each dimension might be informing each other expression, a non-recursive model, that is, with reciprocal effects amongst the three dimensions would hinder the model identification, thus requiring additional variables to enable the model identification. Further, as CAT also posits that action-control beliefs mediate the person's volitional and agentic actions (Shogren, Wehmeyer, & Palmer, 2017), we propose a model with a specific relationship amongst self-determination dimensions, to determine its empirical adjustment in a sample of young Spanish people with and without intellectual disability. The main aim of this study is thus to empirically test the presented model and adjust it, if needed, to determine the model that better fits and explicates our data variance and variability. Further, and given the disparities found amongst young people with and without intellectual disability in previous studies, a second aim of this study was also to determine the model adjustment amongst participants.

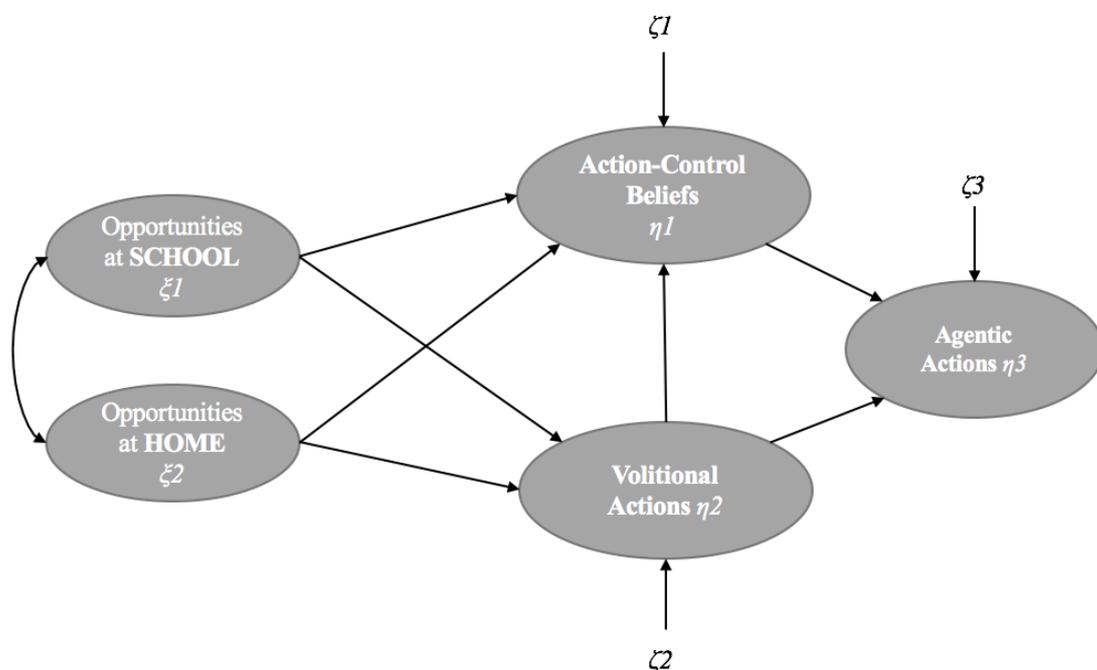


Figure 1. *Theoretical model of the impact of context on self-determination dimensions.*

## Method

### Participants

Study participants were intentionally recruited from 31 middle and high schools or college universities across different regions of Spain. In total, 620 middle school and high school students in Spain participated in the study; 371 were students with disabilities. For the purpose of this study, 29 students with disabilities but without cognitive impairments were withdrawn of the final sample, resulting in 591 participants. From those, 342 (57.8%) were students with intellectual disability enrolled in segregated settings, schools that are only attended by students with disabilities, and 249 (42.2%) were students without disabilities enrolled in general education schools or universities. It must be noted that, in Spain, students with intellectual disability with the age to attend middle and high school are primarily enrolled in segregated settings. On average, students ranged in age from 13 to 22 years old ( $M = 16.95$ ;  $SD = 2.02$ ), the majority being male (57.4%). Most of the students were enrolled in 9th (20.1%) or 10th grade (29.3%). Students enrolled in beyond compulsory education programs were either in 11th or 12th grade (5.9%), in vocational training programs (25.4%), universities (13.9%), or transition to adult life programs for students with disabilities (5.4%). Students with disabilities were primarily diagnosed with mild (34.8%), moderate (43.6%), and severe (21.6%) intellectual disabilities.

### Instruments

***The Self-Determination Inventory: Student Report (Spanish interim version)***. This instrument is intended to measure the essential characteristics of self-determined actions as described in the introduction. The SDI:SR (Spanish interim version) contains 45 items that are divided into three essential characteristics and seven subconstructs. The dimension of volitional action contains 13 items and gathers information about

autonomy (6 items) and self-initiation (7 items). The agentic-action dimension includes 10 items, that assess self-direction (6 items) and pathways thinking (4 items) Finally, the action-control beliefs dimension (22 items) includes control expectancy (9 items), psychological empowerment (7 items), and self-realization (6 items).

The online version of the Spanish SDI:SR was used in this study. To answer each item, students moved a cursor on a slider bar that marked their response 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 and vice versa. The slider bar captured numbers from 0 to 10 with two decimals precision. The SDI:SR (Spanish interim version) has demonstrated good psychometric attributes. Previous research has established a 3 second-order (volitional action, agentic action, action control beliefs) and 7 first-order factorial structure with construct validity analysis demonstrating a good fit of the theoretical model and measurement invariance being established across students with and without disabilities (Mumbardó-Adam et al., in press).

***The AIR Self-Determination Scale.*** The AIR-S measures a person’s capacities and opportunities for self-determination and is available in student, educator, and parent versions (Wolman, Campeau, DuBois, Mithaug, & Stolarski, 1994). For the purposes of this study, the Spanish online version of the student form (AIR-S) was used to measure students’ capacity and opportunities for self- determination. The AIR-S has 24 questions that are divided into two scales that gather data on students’ self-reported capacities and opportunities to engage in self-determined actions. The capacity scale is further divided into two subscales and covers questions about student’s (1) ability related to self-determination (Ability subscale) and (2) perceptions about performing self-determined actions (Perception subscale). The Opportunity scale is also composed of two subscales that measure (1) students’ perceptions of their opportunities to perform

self-determined actions at home (Opportunities at Home subscale) and (2) at school (Opportunities at School subscale). Scores are rated on a Likert scale from 1 (Never) to 5 (Always). The AIR has been extensively used in the field and has been shown to have adequate test-retest reliability (.74 after 3 months) and a strong internal consistency (split-half test = .95; Cronbach's alpha ranging from .89 to .99). In terms of validity, the original authors conducted a factor analysis that supported a four-factor structure explaining the 74% of the instrument variance (Mithaug, Mithaug, Agran, Martin, & Wehmeyer, 2002). This instrument has been validated into Spanish context for youth with and without disabilities showing good model fit indices (CFI = .982, TLI = .962, RMSEA = .043), and invariance measurement amongst youth with and without disabilities also held (Mumbardó-Adam, Guàrdia-Olmos, & Giné, 2018). For the purpose of this study, only the opportunities scale was used.

### ***Scales translation and adaptation***

A detailed explanation of the translation and adaptation process of the scales can be found for the SDI:SR (Spanish interim version) ((Mumbardó-Adam et al., in press) and for the AIR-S (Spanish version) (Mumbardó-Adam et al., 2018). Briefly, the process of adapting and validating both the AIR-S and the SDI:SR involved: (a) translating and back translating the original scale, based on Tassé and Craig's (1999) guidelines; (b) experts revising the items based on clarity, importance, and relatedness within the Spanish language and culture and applying their comments and suggestions to the preliminary version of the scale; (c) pilot testing the preliminary version to explore psychometric properties, followed by necessary modifications of the scale; and (d) administering the modified measure with a broader sample to further analyze psychometric properties through structural equation modeling approaches. Overall, both instruments demonstrated acceptable psychometric attributes. Construct validity

analysis confirmed that the alignment with the theoretical model was established, and discriminant validity was also established by measuring invariance across students with and without disabilities in both instruments.

### **Procedures**

General education schools, universities, and special schools spread throughout the geographical zones of Spain were intentionally contacted. From the 48 schools contacted, 5 general education schools, 4 universities, and 21 special schools agreed to participate in the study. Regarding students' selection, different procedures were followed for students with and without intellectual disabilities. For students with an intellectual disability, a sample of the questionnaires was sent to special and general education schools, so teachers could intentionally choose students aged 13 to 22 years who could provide reliable information when answering the questions (i.e., they should have enough language comprehension to understand 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 first-, second-, or third-year class. Once potential participants were selected, consent (either from the parent or the participant if they were of legal age) was obtained.

Students responded to two online self-report surveys on their self-determination skills. They were first asked to complete the SDI:SR (Spanish interim version) and the AIR-S (Spanish version) and were provided as much time as needed to complete the scales. Teachers had received explanations about items meanings and response system and about how to support scales administration, consistently 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). There were no missing answers.

### Data Analysis

The structural relationships analyzed are based on the structural equation model derived from the Figure number 1. The structural equations tested were:

$$\eta_1 = \gamma_{11}\zeta_1 + \gamma_{12}\zeta_2 + \beta_{12}\eta_2 + \zeta_1$$

$$\eta_2 = \gamma_{21}\zeta_1 + \gamma_{22}\zeta_2 + \zeta_2$$

$$\eta_3 = \beta_{31}\eta_1 + \beta_{32}\eta_2 + \zeta_3$$

This model involves the simultaneous use of variables that are directly observable without error, latent variables ( $\eta_i$  and  $\zeta_j$ ), some parameters ( $\beta_{ij}$  and  $\gamma_{ij}$ ) and the term of error ( $\zeta_i$ ). Also, in order to align with the general precepts and assumptions of structural equation models, the following statistical assumptions are assumed for the quantitative variables:  $E(X_i) = E(Y_i) = E(\zeta_i) = 0$  and  $Var(X_i) = Var(Y_i) = Var(\zeta_i) = 1$ . Accordingly, all the quantitative variables were transformed through reduction and normalization, and  $E(\varepsilon_i\varepsilon_j) = E(\delta_i\delta_j) = E(\zeta_i\delta) = E(\eta\varepsilon) = E(\zeta_i\zeta_j) = 0$ ; initially assuming that measurement errors were uncorrelated to each other and also in relation to the observable and latent variables. We will not be discussing the structures of the exogenous measurement models here ( $A_x$  and  $A_y$ ) to keep this presentation brief. The correlations assumed between exogenous variables (both observable and latent) are those proved to be relevant in previous studies. Also, the exogenous measurement models specified in the model at hand comply with the usual application conditions of order. Additionally, the proposed model complies with the identification condition, since it presents positive degrees of freedom ( $df = 945$ ) and adequate fit indices. Very briefly, in Mumbardó et al. (in press) the general results of the measurement model are presented ( $CFI = .942$ ,  $TLI$

= .953, *SRMR* = .106, *BIC* = -126370.97, *AIC* = -125772.96;  $\chi^2_{(945)} = 2877.92$ ,  $p < .001$  and ratio  $\chi^2/df = 3.045$ )

As exposed, and given that the response scales differed for the essential characteristics of self-determination as measured by the SDI:SR (Spanish interim version) and the opportunities provided both at home and at school measured by the AIR-S (Spanish interim version), scores were transformed into Z-scores. First, a structural equation model was performed to test the relationship between the three essential characteristics of self-determination and provided contextual opportunities, with maximum likelihood estimation of model fit. School and home opportunities were treated as exogenous variables and were modeled to have a direct effect on action-control beliefs and volitional actions. Second, after the global model analysis, we carried out a MIMIC (Multiple Indicators Multiple Causes) analysis including the analysis between the two groups derived from the presence or absence of Intellectual Disability (ID), as this critical variable can explain an important part of the variance of the endogenous latent variables ( $\eta_1$ ,  $\eta_2$  and  $\eta_3$ ). All the analyses were run using the Mplus software (5.0) (Muthén & Muthén, 2012).

## Results

The goodness of fit indices for the theoretical model tested (Model 1) showed a good model fit (*CFI* = .998, *TLI* = .992, *SRMSR* = .008, *RMSEA* = .041 [.00 - .101]). The chi-square test was also statistically no significant ( $\chi^2_{(2)} = 4.023$ ,  $p = .1338$ ), and the value of the ratio of  $\chi^2$  by degrees of freedom was excellent. A nonsignificant path was found from school opportunities to volitional actions ( $\gamma_{21} = .054$ ;  $p = .214$ ). For this reason, this same model was tested again excluding the non significant path between opportunities at school and volitional actions (Model 2). For this new model the structural equations tested were the following:

$$\eta_1 = \gamma_{11}\xi_1 + \gamma_{12}\xi_2 + \beta_{12}\eta_2 + \zeta_1$$

$$\eta_2 = \gamma_{22}\xi_2 + \zeta_2$$

$$\eta_3 = \beta_{31}\eta_1 + \beta_{32}\eta_2 + \zeta_3$$

For this second model, the goodness of fit indices showed a slightly improved model fit ( $CFI = .998$ ,  $TLI = .993$ ,  $SRMSR = .011$ ,  $RMSEA = .038$  [.00 - .087]). The chi-square test was also non statistically significant ( $\chi^2_{(3)} = 5.579$ ,  $p = .134$ ), and the value of the ratio of  $\chi^2$  by degrees of freedom was excellent. Path loadings values of both models were almost identical and are presented in Table 1. Despite the few differences between both models, the reduction in errors variances and a slight improvement in  $\chi^2$  recommends this second model as more appropriate ( $\Delta\chi^2 = 1.556$ ;  $df = 1$ ;  $p = .212$ ).

Table 1.

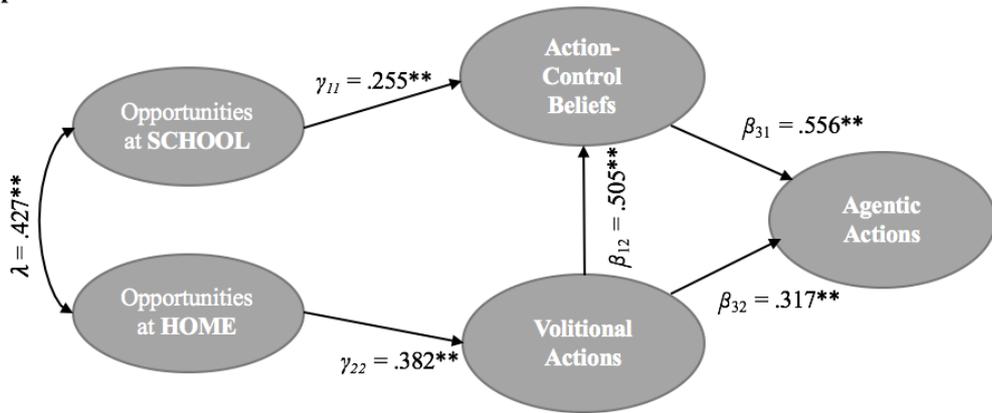
*Path loadings values of the two structural equation models tested (Endogenous and exogenous variables depend of each equation).*

Endogenous variables	Exogenous variables	Model 1	Model 2
Volitional Actions on	School	.054	-
	Home	.372**	.400**
Agentic Actions on	Volitional Actions	.406**	.403**
	Action Control beliefs	.502**	.503**
Action Control beliefs on	School	.233**	.233**
	Home	.119**	.118**
	Volitional Actions	.518**	.512**
<i>Relationship amongst exogenous variables</i>			
School with Home		.498**	.499**

Note: \*  $p < .005$ , \*\*  $p < .001$ .

MIMIC analysis shed acceptable model fit indices ( $CFI = .992$ ,  $TLI = .977$ ,  $SRMSR = .031$ ,  $RMSEA = .069$  [.022 - .115]), except for the  $RMSEA$  that was slightly higher than acceptable (Hu & Bentler, 1999). The chi-square test was also statistically significant ( $\chi^2(6) = 14.347$ ,  $p = .026$ , with  $\chi^2_{\text{No disability}} = 9.756$  and  $\chi^2_{\text{Intellectual disability}} = 4.591$ ), though this index is highly influenced by large effect sizes (Hooper, Coughlan, & Mullen, 2008). However, the value of the ratio of  $\chi^2$  by degrees of freedom; which stands as a reasonable index for global fit (Byrne, 2013), specially considering chi square index weaknesses; was excellent (2.4). The two tested models shared similar path loadings (see Figure 3), though two main peculiarities must be noted. First, in the no-disability model, opportunities at home were not found to have a significant impact on action-control beliefs ( $\gamma_{12} = .084$ ;  $p = .214$ ). Second, the loading value of the relationship amongst opportunities at home and at school notably increased in the intellectual disability model, while the other loadings values remained similar.

**Participants without disabilities**



**Participants with intellectual disability**

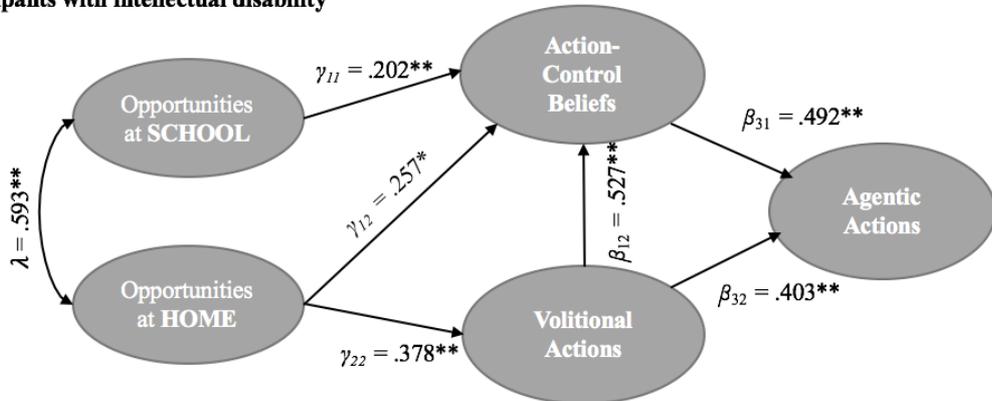


Figure 2. Multiple Indicator Multiple Cause models between the two groups derived from the presence or absence of ID.

Note: \*  $p < .005$ , \*\*  $p < .001$

**Discussion**

The main aim of this study was to empirically validate the proposed integrative model that pretended to explore the impact of contextual opportunities on the self-determination essential characteristics in young people with and without intellectual disability to build upon existent knowledge. Although opportunities at home did impact all self-determination-related constructs, opportunities at school only directly influenced action-control beliefs and indirectly influenced agentic actions. Also, a concrete relationship amongst essential characteristics was empirically sustained with agentic

actions being impacted by action-control beliefs and volitional actions and action-control beliefs by volitional actions. Additionally, when linkages amongst variables were explored distinctively for participants with and without ID, the proposed model held with youth with ID but was slightly altered with youth without ID, with opportunities at home not significantly impacting action-control beliefs.

This work is not exempt though of some limitations that must be considered when interpreting the results. First, the instrument used to assess essential characteristics of self-determination (SDI:SR) is still being studied to adjust it to its original version, though enough evidence has been gathered to support the current robustness of the version of the instrument used in this study (e.g., Mumbardó-Adam et al., in press). Second, participants with intellectual disability were all enrolled in segregated settings, and thus school contexts were distinct for the two groups of participants. Future research should aim at replicating this work with students with disabilities enrolled in inclusive settings, so as to add to these results by providing further insight on the differences on self-determination expression, as a function of the presence of a disability in the same context. Third, only environmental variables such as opportunities provided to engage in self-determined actions at home and at school were integrated in the model, although personal variables such as age or gender (Mumbardó-Adam et al., 2017) play also key roles in self-determination expression (Wehmeyer et al., 2011). Future research must then endeavor in including personal but also other environmental variables such as peers' relationship and leisure networks, that might be impacting efforts to promote self-determination. Finally, it must be noted that the presented model adjusts with our empirical data, but further efforts must be driven towards replicating and broadening this model amongst countries, contexts, cultures, and importantly, including different types of disabilities, to inform this emergent

knowledge.

Despite these limitations, the results strongly sustain several assumptions. First, research in self-determination must control for school and home opportunities' variables as they visibly influence self-determination dimensions. Future investigations must then assess and consider these contextual variables since self-determination expression is indeed closely entangled with situational characteristics, as we have empirically demonstrated. Second, though opportunities given at home to engage in self-determined actions positively impact self-determination expression, in line with a recent study held in the Spanish context (Vicente-Sánchez et al., 2018), opportunities at school were not influencing volitional actions. Educative contexts impact action-control beliefs, but less opportunities are provided to develop volition, probably due to the static nature of academic contexts where autonomy and volition are restricted or limited to academic activities, specially in high and middle school contexts, at least in Spain. However, teaching self-determination necessarily implies promoting its three essential characteristics. Third, it must be noted the concrete relationships amongst dimensions, thus emphasizing the model dimensionality and the dimensions' proper entity and function, although future research is needed. The mediating role of action-control beliefs between volitional and agentic actions must be further explored, due to the crucial role these effects can play in both comprehending the construct and designing interventions to promote it. Volitional actions seem to influence the beliefs about one's actions, contributing to build students' positive and tailored action-control beliefs adjusted to their preferences and needs. This knowledge might be, in turn, informing and nuancing actions regulation and direction, though further research must be done to strengthen this knowledge by replicating and expanding the analysis of the relationship among self-determination dimensions in different conditions (e.g., in other cultures,

with other samples' characteristics). As this is the first attempt to empirically disentangle the relationship amongst essential characteristics, it must be replicated to strengthen or nuance these findings, as other relationships not proved in this work might be also found relevant.

In this sense, this study triggers relevant implications for practice, as it confirms that contextual variables, namely opportunities at home and in educational settings, must be considered to rigorously assess and teach self-determination. Concretely in youth without disabilities, opportunities in each context seem to be influencing different essential characteristics, thus highlighting the lack of common strategies or collaborative work amongst contexts. At home, special attention is driven on cultivating the adolescent volition and autonomy and subsequently regulating their actions, but further research and efforts must be driven to support families on promoting their children adjusted, intrinsically driven and positive beliefs about their actions and the control exerted over them. In youth with ID, that were all enrolled in segregated settings where ratios are much smaller than in mainstream settings and where families are used to be part of the school daily activities, relationships amongst contexts were found to be stronger, thus stressing a more solid collaboration towards supporting youth self-determined actions. Considering the strong and reciprocal effect of opportunities at school and at home, additional efforts must then be devoted to build effective and sustainable bridges across contexts to provide opportunities to engage in volitional and agentic actions and to build positive and adjusted action-control beliefs. In all youth but particularly in youth without ID within the Spanish context, additional work urges to strengthen school and home work and ways to nurture their practices to provide opportunities, in educational contexts, to work on non academic matters, such as setting goals based on personal preferences and planning its attainment.

Further, and perhaps more importantly, the relationship found among the three dimensions suggests that promoting self-determination implies teaching its three essential characteristics and related skills, without limiting the instruction to just one of the dimensions (Wehmeyer, 2005). In line with the existent knowledge that endorses the efficacy of multicomponent interventions, that is, interventions that tackle diverse component elements of self-determination, in comparison with single-component ones (Cobb, Lehmann, Newman-Gonchar, & Alwell, 2009) self-determination instruction must ensure a complete and global approach, though acknowledging that some concrete skills would need further learning supports than others. In exclusively teaching autonomy or self-knowledge, for instance, we are not teaching self-determination, although these essential skills are needed to engage in self-determined actions. In the school context, for example, practitioners should endeavor on providing students with opportunities to engage in self-determined actions across curricular contents and contexts (Raley et al., 2018) instead of focusing on singular self-determination-related skills. At least in the Spanish context, further work is needed to imbue practitioners' knowledge and practice of this comprehension of self-determination as composed of these three dimensions for youth to benefit from a complete approach and learning of self-determination.

### References

- Byrne, B. M. (2013). *Structural equation modeling with Mplus: Basic concepts, applications, and programming*. New York: Routledge.
- Carter, E. W., Owens, L., Trainor, A. A., Sun, Y., & Swedeen, B. (2009). Self-determination skills and opportunities of adolescents with severe intellectual and developmental disabilities. *American Journal on Intellectual and Developmental Disabilities, 114*(3), 179-192. doi: 10.1352/1944-7558-114.3.179

- Cobb, B., Lehmann, J., Newman-Gonchar, R., & Alwell, M. (2009). Self-determination for students with disabilities: A narrative metasynthesis. *Career Development for Exceptional Individuals, 32*(2), 108-114.  
<https://doi.org/10.1177/0885728809336654>
- Deci, E. L., & Ryan, R. M. (2008). Facilitating optimal motivation and psychological well-being across life's domains. *Canadian Psychology, 49*(1), 14-23.
- Deci, E. L., & Ryan, R. M. (2012). Motivation, personality, and development within embedded social contexts: An overview of self-determination theory. In R. M. Ryan (Ed.), *The Oxford handbook of human motivation* (pp. 85-107). Oxford Library on Psychology.
- Hooper, D., Coughlan, J., & Mullen, M. R. (2008). Structural equation modeling: guidelines for determining model fit. *Electronic Journal of Business Research Methods, 6*(1), 53-60.
- Hu, L., & Bentler, P. M. (1999). Cutoff criteria for fit indexes in covariance structure analysis: Conventional criteria versus new alternatives. *Structural Equation Modeling, 6*(1), 1-55. doi: 10.1080/10705519909540118.
- Karvonen, M., Test, D. W., Wood, W. M., Browder, D., & Algozzine, B. (2004). Putting self-determination into practice. *Exceptional Children, 71*(1), 23-41. doi: 10.1177/001440290407100102
- Kim, N. H., & Park, J. (2012). The Effects of the Family-Involved SDLMI on Academic Engagement and Goal Attainment of Middle School Students with Disabilities Who Exhibit Problem Behavior. *International Journal of Special Education, 27*(1), 117-127.

- Milyavskaya, M., & Koestner, R. (2011). Psychological needs, motivation, and well-being: A test of self-determination theory across multiple domains. *Personality and Individual Differences, 50*(3), 387-391. doi:10.1016/j.paid.2010.10.029
- Mithaug, D. E., Mithaug, D. K., Agran, M., Martin, J. E., & Wehmeyer, M. L. (Eds.) (2002). *Self-determined learning theory: Construction, verification, and evaluation*. Mahwah, NJ: Lawrence Erlbaum Associates, Publishers.
- Muthén, L. K., & Muthén, B. O. (2012). *Mplus. The comprehensive modelling program for applied researchers: User's guide, 5*. Los Angeles: Muthén & Muthén.
- Mumbardó-Adam, C., Guàrdia-Olmos, J., Adam-Alcocer, A. L., Carbó-Carreté, M., Balcells-Balcells, A., Giné, C., & Shogren, K. A. (2017). Intellectual Disability Classification, Self-Determination and Context: A Meta-analytic study. *Intellectual and Developmental Disabilities, 55*(5), 303–314. doi: 10.1352/1934-9556-55.5.303
- Mumbardó-Adam, C., Guàrdia-Olmos, J., & Giné, C. (2018). Assessing self-determination in youth with and without disabilities: The Spanish version of the AIR self-determination scale. *Psicothema, 30*(2), 238-243. doi: 10.7334/psicothema2017.349
- Mumbardó-Adam, C., Guàrdia-Olmos, J., Giné, C., Shogren, K. A. & Vicente, E. (in press). Psychometric properties of the Spanish version of the Self-Determination Inventory Student Self-Report: a Structural Equation Modeling Approach. *American Journal on Intellectual and Developmental Disabilities*.
- Raley, S. K., Mumbardó-Adam, C., Shogren, K. A., Simó-Pinatella, D., & Giné, C. (2018). Curricula to teach skills associated with self-determination: A review of existing research. *Education and Training in Autism and Developmental Disabilities*.

- Rich, G. J. (2003). The positive psychology of youth and adolescence. *Journal of Youth and Adolescence*, 32, 1–3.
- Ryan, R. M., & Deci, E. L. (2000). Self-determination theory and the facilitation of intrinsic motivation, social development, and well-being. *American psychologist*, 55(1), 68. doi: 10.1037/0003-066X.55.1.68
- Shogren, K. A. (2013). A Social–Ecological Analysis of the Self-Determination Literature. *Intellectual and Developmental Disabilities*, 51(6), 496-511. doi: 0.1352/1934-9556-51.6.496
- Shogren, K. A., Little, K. A., & Wehmeyer, M. L. (2017). Human agentic theories and the development of self-determination. In M. L. Wehmeyer, K. A. Shogren, T. D. Little and S. J. Lopez (Eds.). *Development of Self-Determination through the life-course*. US: Springer.
- Shogren, K. A. & Turnbull, A. P. (2006). Promoting self-determination in young children with disabilities: The critical role of families. *Infants & Young Children*, 19(4), 338-352. <https://doi.org/10.1097/00001163-200610000-00006>
- Shogren, K. A., Wehmeyer, M. L., Little, T. D., Forber-Pratt, A. J., Palmer, S. B., & Seo, H. (2017). Preliminary validity and reliability of scores on the *Self-Determination Inventory-Student Report* version. *Career for Development and Transition for Exceptional Individuals*, 50(3), 251-263. doi: 10.1177/2165143415594335
- Shogren, K. A., Wehmeyer, M. L., & Palmer, S. B. (2017). Causal Agency Theory. In M. L. Wehmeyer, K. A. Shogren, T. D. Little and S. J. Lopez (Eds.). *Development of Self-Determination through the life-course*. US: Springer.
- Shogren, K. A., Wehmeyer, M. L., Palmer, S. B., Forber-Pratt, A. J., Little, T. D., & Lopez, S. (2015). Causal agency theory: reconceptualizing a functional model of

self-determination. *Education and Training in Autism and Developmental Disabilities*, 50(3), 251-263.

Shogren, K. A., Wehmeyer, M. L., Palmer, S. B., Soukup, J. H., Little, T. D., Garner, N., & Lawrence, M. (2007). Examining individual and ecological predictors of the self-determination of students with disabilities. *Exceptional Children*, 73(4), 488-510. doi: 10.1177/001440290707300406.

Tassé, M., & Craig, E. M. (1999). Critical issues in the cross-cultural assessment of adaptive behaviour. In R. L. Schalock (Ed.), *Adaptive behaviour and its measurement: Implications for the field of mental retardation* (pp. 161-184). Washington, DC: American Association on Mental Retardation.

Vicente-Sánchez, E., Guillén-Martín, V. M., Verdugo-Alonso, M A., & Calvo-Álvarez, M. I. (2018). El rol de los factores personales y familiares en la autodeterminación de jóvenes con discapacidad intelectual. *Psicología Educativa*. doi: 10.5093/psed2018a13

Wehmeyer, M. L. (1999). A functional model of self-determination: Describing development and implementing instruction. *Focus on autism and other developmental disabilities*, 14(1), 53-61.

Wehmeyer, M. L. (2005). Self-determination and individuals with severe disabilities: Re-examining meanings and misinterpretations. *Research and Practice for Persons with Severe Disabilities*, 30(3), 113-120. Doi: 10.2511/rpsd.30.3.113

Wehmeyer, M. L., Abery, B. H., Zhang, D., Ward, K., Willis, D., Hossain, W. A., . . . Walker, H. M. (2011). Personal self-determination and moderating variables that impact efforts to promote self-determination. *Exceptionality*, 19, 19-30. doi: 10.1080/09362835.2011.537225.

Wehmeyer, M. L. & Garner, N. W. (2003). The impact of personal characteristics of

people with intellectual and developmental disability on self-determination and autonomous functioning. *Journal of Applied Research in Intellectual Disabilities*, 16, 255–265. doi: 10.1046/j.1468-3148.2003.00161.x

Wehmeyer, M. L., Kelchner, K., & Richards, S. (1996). Essential characteristics of self-determined behavior of individuals with mental retardation. *American Journal on Mental Retardation*, 100(6), 632-642.

Wehmeyer, M. L., & Palmer, S. B. (2003). Adult outcomes for students with cognitive disabilities three-years after high school: The impact of self-determination. *Education and Training in Developmental Disabilities*, 38(2), 131–144.

Wolman, J. M., Campeau, P. L., DuBois, P. A., Mithaug, D. E., & Stolarski, V. S. (1994). *Air Self-Determination Scale and User Guide*. Columbia: American Institutes for Research.



# 05

## GENERAL **DISCUSSION**

---





Approaching the relationship amongst contextual variables and self-determination in the literature of the last decades has highlighted the lack of studies tackling this issue, specially for environmental variables. As presented in Mumbardó-Adam et al., (2017), the relationship between self-determination and personal variables have been further studied, but less research has focused on environmental variables, and even less studies have included participants with and without disabilities. For this main reason, this doctoral thesis aimed at exploring the impact of contextual opportunities, namely home and educational contexts, on the self-determination expression of young people with and without disabilities. To achieve this main goal, the second, third, fourth and fifth article delved into the adaptation and validation of the instruments used to assess self-determination in a sample of Spanish adolescents and young adults and into its scores psychometric properties. This previous work was needed so as to answer to the main objective of this doctoral thesis, which was tackled in the sixth article. However, some limitations that have important implications in interpreting these thesis results and discussion must be first displayed.

## **5.1 Limitations**

Despite the great efforts done in trying to embrace the wide variability of educational contexts and placements, autonomous communities and personal characteristics of participants, the resultant sample was collected intentionally. Regarding participants with disabilities, most of them were students with intellectual disability (at least as a primary diagnose) enrolled in segregated educational settings.

First, and according to the Spanish educational policy, teachers were responsible for providing their students diagnoses and disabilities, but in mainstream settings, this information was difficult to obtain. Most of the teachers from mainstream settings expressed their disagreement to answer to the questionnaires, due to their lack of time and the amount of questionnaires they should have answered. In fact, compared to

segregated settings where there typically are two teachers for every eight to ten students, in mainstream settings, the ratio exponentially increases to one teacher per 30 students in secondary mainstream education. Also, teachers and schools in general are not usually encouraged or used to collaborate with researches led from universities. For these reasons, and although they were asked to at least respond the questionnaires of those students having a disability so as to clearly identify them, some students might have been misidentified. Also, and despite teachers were asked to provide their students' disabilities only if they had a diagnose, ID severity was not always available in students' diagnoses as teachers might only have an official statement without this information, and might have provided it according to their subjective opinion. Further efforts must be driven, in future studies held in Spain, to accurately obtain participants' diagnoses and, perhaps more importantly, participants' support needs (Mumbardó-Adam, Guàrdia-Olmos, Adam-Alcocer et al., 2017), an undoubtedly better measure of the person development and performance in his or her context. However, despite evidences in Spanish context that indicate that support needs act as a better predictor of self-determination expression than intellectual functioning in youth with ID (Vicente et al., 2017), students support needs are still not always assessed or reported for these students.

Second, the weak presence of participants with disabilities but without ID do also limit the extent to which our results might be interpreted. Although differences between students with disabilities but without ID and those with ID in self-determination scores were not found to be significant for the purposes of this study, as reported in Mumbardó-Adam, Guàrdia-Olmos and Giné, (2018a), future researches would endeavor in collecting a more representative data of students with disabilities but without ID so as to ascertain that the results presented are really representative for this population.

Third, and partially given to the difficulty of finding adolescents with intellectual disability in mainstream educational contexts, when talking about opportunities in

educational settings to engage in self-determined actions, differences between those settings, that is mainstream and segregated settings, must be acknowledged, as exposed in Mumbardó-Adam, Guàrdia-Olmos and Giné (2018c). Even in mainstream settings there are inherent differences that must be considered, as most participants above eighteen years old were enrolled in universities, and those below eighteen in mainstream schools. Similarly, family contexts were not described in detail, and thus might have been extremely different regarding their compositions, place of living, and socioeconomic background, among others.

Finally, collecting data through self-report questionnaires in participants with disabilities entails some hindrances that must be taken into account when interpreting the results (Finlay & Lyons, 2001; Hartley & MacLean, 2006). As described in this thesis articles, students with disabilities were offered supports, if needed, to understand questionnaires items. In this sense, some asked for examples when trying to comprehend items meaning. Though exemplifying the situations depicted in those items was clearly useful to enhance their comprehension, this strategy also jeopardized the generalization of these situations to other conditions different from the examples provided. For example, a participant might consider that he or she always takes into account past leisure experiences when deciding how to spend his or her free time, but might not act accordingly in academic situations. For this main reason, information provided by other informants that closely know the person being assessed might offer additional information to embrace all the situations where a person can act. Within the Spanish context, a questionnaire framed into Causal Agency Theory is being developed to respond to this need (Vicente, Guillén, Gómez, Ibáñez, & Sánchez, 2018).

## 5.2 Instruments adaptation and validation to Spanish context

The adaptation and validation of the instruments used to assess both the three essential characteristics of self-determination (SDI:SR) and the opportunities provided by educational and home contexts for youth to engage in self-determined actions (AIR Self-determination scale) suggested that both instruments were psychometrically robust enough to be used into the Spanish context and with youth with and without disabilities (Mumbardó-Adam et al., in press, Mumbardó-Adam, Guàrdia-Olmos, & Giné, 2018b). Evidences of reliability and validity are further displayed in the articles above presented suggesting that self-determination essential characteristics and opportunities provided at home and in educational settings were reliably and validly assessed and that the same construct was measured across participants with and without disabilities. Further work was needed though, specially in the SDI:SR, as the original instrument was still under validation when it was adapted to Spanish, and thus not in its final structure.

However, and despite the work done to provide practitioners and researchers with these two robust measures adapted to the Spanish context to assess self-determination and besides, for all students, further efforts must be devoted to increase teachers and practitioners' awareness about the need to promote and thus accurately assess self-determination. In a recent study held with teachers and professionals working in segregated settings either with students or with adults with ID (Vicente, Mumbardó-Adam, Simó-Pinatella, & Coma, 2018), professionals were asked about their current practices, as well as about the supports and barriers encountered in promoting self-determined actions with their students or adults. Although most of them affirmed providing youth and adults with ID with opportunities to engage in self-determined actions, they asserted ignoring if there were resources available to support their practices. Further, with adolescents and young adults without disabilities, with whom learning is further focused on academic issues in detriment of career and transition related skills, teachers would presumably be as unaware as their counterparts working

in segregated settings, not only about resources and supports to teach self-determination, but also about the relevance to do so. Accordingly, participants without disabilities of the sample of this doctoral thesis reported having less opportunities to engage in self-determined actions in educational contexts, as compared with their peers with disabilities (Mumbardó-Adam, Guàrdia-Olmos, & Giné, 2018b), despite the benefits that self-determination instruction and promotion entails both for youth with and without disabilities (Shogren, Lopez et al., 2006; Shogren, Wehmeyer, & Lane, 2016). In Spain, burgeoning initiatives such as adapting an intervention model to guide teachers in self-determination instruction (Mumbardó-Adam, Vicente, et al., 2017) or working with families to understand their perspectives to thus lay the foundations for tailored promotion initiatives (Arellano & Peralta, 2013) have emerged, but further efforts must be driven to foster both practitioners' and families' awareness of the importance of self-determination promotion as well as the available resources and supports.

### **5.3 Analysis of psychometric properties of SDI:SR (Spanish version) scores**

Despite the results below mentioned that supported the factorial structure of the SDI:SR (Spanish version) and its use in youth with and without disabilities, further work was needed both because of the heterogeneous population this instrument was targeted to, and also given that its original version was still under development and validation. In the third and fourth paper we explored items discrimination and functioning (Mumbardó-Adam, Guàrdia-Olmos, Giné et al., 2017) and we verified that the set of items intended to measure the three self-determination essential characteristics was not influenced by an external variable, such as the presence of disability (Mumbardó-Adam, Guàrdia-Olmos, & Giné, 2018a). In fact, contrary to the AIR Self-determination scale, a robust measure which psychometric scores have been analyzed in a wide variety of samples across cultures, the SDI:SR was still under validation in its original form, and considering the initial setbacks encountered, for example with the self-regulation dimension of the

scale, further work was even more compelling to ascertain its psychometrical robustness. The results exposed suggested that items discrimination patterns were satisfactory in the overall sample (youth with and without disabilities) (Mumbardó-Adam, Guàrdia-Olmos, Giné et al., 2017) and that items' differential functioning as a function of the presence of disability in the sample was weak. Areas for further revision were highlighted, and the creation of a short version of the scale to facilitate its use in educational contexts was also recommended (Mumbardó-Adam, Guàrdia-Olmos, Giné et al., 2017).

Further, as suggested in Mumbardó-Adam, Guàrdia-Olmos and Giné (2018a), jointly analyzing U.S. and Spanish data would support the cross-cultural nature of the self-determination construct and would as well align both instruments structures to allow for cross-cultural studies and data comparisons. For this main reason, and given that during the validation process of the original U.S. version of the scale, the instrument was reduced to 21 items (see Shogren, Little, et al., in press for a full description of item refinement), U.S. and Spanish data have been recently analyzed to align the Spanish version of the scale to the U.S. shorter structure (Shogren, Shaw, Mumbardó-Adam, in press). Though results indicate that a 21 items version of the Spanish adaptation would as well accurately measure the three essential characteristics of the self-determination construct, in some specific items measurement variance across youth with and without ID did not hold. Future research should aim at norming the SDI:SR Spanish version and exploring if different norms might be considered for youth with and without ID.

#### **5.4 Impact of contextual opportunities in self-determination of young people**

As discussed in detail in the sixth paper, a model integrating contextual opportunities and self-determination essential characteristics was suggested so as to better comprehend the relationship amongst these measurable constructs. A specific relationship held amongst constructs thus suggesting self-determination essential characteristics own entity and connection that must be further explored and verified. The newness of the theoretical framework in which this thesis is rooted and the need to understand the impact of contextual opportunities in all youth claim for continuing this initial work to pinpoint the relationship and influence amongst constructs. Also, opportunities provided in home and educational contexts to engage in self-determined actions significantly impacted the essential characteristics of self-determination, accounting thus for some of the variance of the model tested.

When analyzing the impact of those contexts in self-determination related constructs, slight differences were observed when comparing the samples of youth with and without ID and its implications were further discussed in the sixth paper of this doctoral thesis. Undeniably, and despite the differences in opportunities youth with and without disabilities reported amongst contexts (Mumbardó-Adam, Guàrdia-Olmos, & Giné, 2018b) these two environments played a significant role in youth self-determination expression. Up to this point, it is no longer about if self-determination instruction is beneficial for all individuals, but about how to design positive environments to foster and support all youth self-determined actions. Further work is though needed to identify the characteristics of those contexts that may either propel or thwart self-determination expression. For this main reason, research and practice in self-determination promotion would benefit of a more in depth qualitative analysis of familiar and educational contexts individualities, so as to inform practitioners and even stakeholders controlling for resources allocations of the environments characteristics needing to be nurtured and supported or improved. This knowledge has the potential not only to inform self-

determination instruction practices, but also to gain further awareness about how families and educational environments can, purposely or not, propel or thwart self-determined actions.

Further, and perhaps more importantly, future research must work towards assessing and treating context not only as an intervening variable (Shogren, Luckasson, & Schalock, 2014) that impacts and influences self-determination, but also acknowledging that the person's actions modulates, in turn, these environments. As previously discussed, acting in a self-determined manner also implies taking into account the rules and dynamics embedded in the sociocultural framework where the person develops and integrates a more adjusted knowledge about the strategies of action that better suits a specific context. Actions have in each context a socially shared meaning, they rise and are originated within this context and, consequently, the person who acts in a self-determined manner in a specific environment contributes to shape and change it. Future research should then endeavor in determining how those changes originated by the person engaging in self-determined actions affects the context response to those actions, specially regarding individuals with ID who have traditionally been less prompted to act and have been less recognized to be self-determined.

## 5.5. Conclusions

This dissertation has presented 1) the results of the validation of two instruments intended to measure self-determination of Spanish youth with and without disabilities, 2) an in-depth analysis of its scores psychometric properties, and 3) the impact of opportunities provided at home and in educational settings on self-determination of these youths. Several assumptions stem thus from this doctoral thesis:

1. Self-determination, as defined through Causal Agency Theory, is a measurable construct that can thus be measured in youth with and without disabilities. Further, we have proposed an integrative model to understand and disentangle the specific relationship amongst self-determination essential characteristics and contextual opportunities, though it needs to be developed and adjusted across contexts, cultures and diversity of participants.
2. Measures to assess essential characteristics of self-determination (SDI:SR) and opportunities provided (AIR Self-determination scale) have demonstrated good psychometric properties in youth with and without disabilities, though further work is required, for example to norm the scales.
3. Home and school contexts play a significant and specific role in self-determination expression, with slight disparities across youth. Each context seems to be influencing different essential characteristics of self-determination and thus further efforts must be devoted to establish collaborative initiatives across home and educational contexts.
4. Practitioners and researchers can currently assess self-determination in all youth to inform tailored instructional plans with, at least, the SDI:SR and AIR Self-determination Scale (Spanish versions), but it urges to increase teachers and practitioners' awareness about the need to promote and thus accurately assess self-determination, given the benefits this instruction entails in several domains of adolescent and adult life.



# 06

## REFERENCES

---





- Abery, D. E. & Stancliffe, R. J. (2003). An ecological theory on self-determination. In M. L. Wehmeyer, B. H. Abery, D. E. Mithaug & R. J. Stancliffe (Eds.), *Theory in Self-determination. Foundations for educational practice* (pp. 25-79). Springfield, Illinois: Thomas Publisher.
- Abery, B. H., Stancliffe, R. J., Smith, J. G., Elkin, S. V., & Springborg, H. L. (2000). *Minnesota Self-Determination Scales-Adult edition*. Minneapolis: University of Minnesota, Research and Training Center on Community Living and Institute on Community Integration.
- Algozzine, B., Browder, D., Karvonen, M., Test, D. W., & Wood, W. M. (2001). Effects of interventions to promote self-determination for individuals with disabilities. *Review of Educational Research*, 71(2), 219-277. <https://doi.org/10.3102/00346543071002219>
- American Psychiatric Association (2013). *Diagnostic and Statistical Manual of Mental Disorders* (5th ed.) Washington, DC: Author.
- Arellano, A., & Peralta, F. (2013). Self-determination of young children with intellectual disability: understanding parents' perspectives. *British Journal of Special Education*, 40(4), 175-181. <https://doi.org/10.1111/1467-8578.12037>
- Brotherson, M. J., Cook, C. C., Erwin, E. J., & Weigel, C. J. (2008). Understanding self-determination and families of young children with disabilities in home environments. *Journal of Early Intervention*, 31(1), 22-43. <https://doi.org/10.1177/1053815108324445>
- Campbell-Whatley, G. D. (2008). Teaching students about their disabilities: Increasing self-determination skills and self-concept. *International Journal of Special Education*, 23(2), 137-144.
- Carter, E. W., Lane, K. L., Pierson, M. R., & Stang, K. K. (2008). Promoting self-determination for transition-age youth: Views of high school general and special

- educators. *Exceptional Children*, 75(1), 55-70.  
<https://doi.org/10.1177/001440290807500103>
- Carter, E. W., Owens, L., Trainor, A. A., Sun, Y., & Swedeen, B. (2009). Self-determination skills and opportunities of adolescents with severe intellectual and developmental disabilities. *American Journal on Intellectual and Developmental Disabilities*, 114(3), 179-192. <https://doi.org/10.1352/1944-7558-114.3.179>
- Carter, E. W., Trainor, A., Owens, L., Sweden, B., & Sun, Y. (2010). Self-determination prospects of youth with high-incidence disabilities: Divergent perspectives and related factors. *Journal of Emotional and Behavioral Disorders*, 18(2), 67-81.  
<https://doi.org/10.1177/1063426609332605>
- Cobb, B., Lehmann, J., Newman-Gonchar, R., & Alwell, M. (2009). Self-determination for students with disabilities: A narrative metasynthesis. *Career Development for Exceptional Individuals*, 32(2), 108-114.  
<https://doi.org/10.1177/0885728809336654>
- Cuenca-Sánchez, Y., Mastropieri, M. A., Scruggs, T. E., & Kidd, J. K. (2012). Teaching students with emotional and behavioral disorders to self-advocate through persuasive writing. *Exceptionality*, 20(2), 71-93.  
<https://doi.org/10.1080/09362835.2012.669291>
- Cummins, R. A. (2002). Proxy responding for subjective well-being: a review. *International Review of Research in Mental Retardation*, 25, 183-207.
- Cummins, R. A. (2005). Moving from the quality of life concept to a theory. *Journal of Intellectual disability research*, 49(10), 699-706. <https://doi.org/10.1111/j.1365-2788.2005.00738.x>
- Deci, E. L. (1992). The relation of interest to the motivation of behavior: A self-determination theory perspective. In K. A. Renninger, S. Hidi, & A. Krapp (Eds.), *The role of interest in learning and development* (pp. 43-70). Hillsdale, NJ, US: Lawrence Erlbaum Associates, Inc.

- Deci, E. L., & Ryan, R. M. (2000). The 'what' and 'why' of goal pursuits: Human needs and the self-determination of behavior. *Psychological Inquiry*, 11, 227-268.
- Deci, E. L., & Ryan, R. M. (2011). Self-determination theory. In P. A. M Van Lange, A. W. Kruglanski, & E. T. Higgins. *Handbook of theories of social psychology* (pp. 416-433). London: SAGE Publications.
- Erwin, E. J., Brotherson, M. J., Palmer, S. B., Cook, C. C., Weigel, C. J., & Summers, J. A. (2009). How to promote self-determination for young children with disabilities: Evidenced-based strategies for early childhood practitioners and families. *Young Exceptional Children*, 12(2), 27-37. <https://doi.org/10.1177/1096250608329611>
- Etxabe, E., Muntadas, T., Ramos, P., Tarela, E., Torredemer, M., & Turpin, A. (2013). *Guía Didáctica Proyecto VIDA. Propuestas docentes para el alumnado de secundario con o sin discapacidad intelectual [VIDA Project manual. Teaching strategies for high school students with or without intellectual disabilities]*. Madrid, España: FEAPS.
- Field, S. & Hoffman, A. (1994). Development of a Model for Self-Determination. *Career Development for Exceptional Individuals*, 17(2), 159-169. <https://doi.org/10.1177/088572889401700205>
- Field, S. & Hoffman, A. (1996). *Steps to self-determination: A curriculum to help adolescents learn to achieve their goals*. Austin, TX: Pro-Ed.
- Field, S., Martin, J., Miller, R., Ward, M., & Wehmeyer, M. (1998). *A Practical Guide for Teaching Self-Determination*. Reston, VA: Council for Exceptional Children.
- Finlay, W. M. L. & Lyons, E. (2001). Methodological issues in interviewing and using self-report questionnaires with people with mental retardation. *Psychological Assessment*, 13(3), 319-335. <https://doi.org/10.1037/1040-3590.13.3.319>
- Frielink, N., Schuengel, C., & Embregts, P. J. (2018). Autonomy support, need satisfaction, and motivation for support among adults with intellectual disability: Testing a self-determination theory model. *American journal on intellectual and*

- developmental disabilities*, 123(1), 33-49. <https://doi.org/10.1352/1944-7558-123.1.33>
- Gamm, S., Elliott, J., Halbert, J. W., Price-Baugh, R., Hall, R., Walston, D., ... & Casserly, M. (2012). *Common Core State Standards and Diverse Urban Students: Using Multi-Tiered Systems of Support*. Council of the Great City Schools.
- Glago, K., Mastropieri, M. A., & Scruggs, T. E. (2009). Improving problem solving of elementary students with mild disabilities. *Remedial and Special Education*, 30(6), 372-380. <https://doi.org/10.1177/0741932508324394>
- Gómez, L. E., Peña, E., Arias, B., & Verdugo, M. A. (2016). Impact of individual and organizational variables on quality of life. *Social Indicators Research*, 125(2), 649-664. <https://doi.org/10.1007/s11205-014-0857-6>
- Gómez-Vela, M., Verdugo, M. A., Badía, M., González-Gil, F., & Calvo, M. I. (2010). La escala de evaluación de la autodeterminación: un instrumento en desarrollo. M. A. Verdugo, M. Crespo, & T. Nieto (Coords.), *Aplicación del paradigma de calidad de vida. VII Seminario de Actualización Metodológica en Investigación sobre Discapacidad* (pp. 83-90). Salamanca: Publicaciones INICO.
- Hagiwara, M., Shogren, K. A., & Leko, M. (2017). Reviewing Research on the Self-Determined Learning Model of Instruction: Mapping the Terrain and Charting a Course to Promote Adoption and Use. *Advances in Neurodevelopmental Disorders*, 1(1), 3-13. <https://doi.org/10.1007/s41252-017-0007-7>
- Halpern, A. S., Herr, C. M., Doren, B., & Wolf, N. H. (2000). *Next S.T.E.P. Student transition and educational planning* (2<sup>nd</sup> Ed). Austin, TX: Pro-Ed.
- Hartley, S. L. & MacLean, W. E. (2006). A review of the reliability and validity of Likert-type scales for people with intellectual disability. *Journal of Intellectual Disability Research*, 50(11), 813-827. <https://doi.org/10.1111/j.1365-2788.2006.00844.x>

- Hoffman, A., Field, S., & Sawilowksy, S. (2004). *Self-determination Assessment Battery. User's guide. Third edition.* Wayne State University: center for Self-determination and Transition.
- Jenaro, C., Verdugo, M. A., Caballo, C., Balboni, G., Lachapelle, Y., Otbrebski, W., et al. (2005). Cross-cultural study of person-centered quality of life domains and indicators: A replication. *Journal of Intellectual Disability Research, 49*(10), 734–739. <https://doi.org/10.1111/j.1365-2788.2005.00742.x>
- Kasser, T., & Ryan, R. M. (1996). Further examining the American dream: Differential correlates of intrinsic and extrinsic goals. *Personality and Social Psychology Bulletin, 22*, 280-287. <https://doi.org/10.1177/0146167296223006>
- Konrad, M., Fowler, C. H., Walker, A. R., Test, D. W., & Wood, W. M. (2007). Effects of self-determination interventions on the academic skills of students with learning disabilities. *Learning Disabilities Quarterly, 30*(2), 89-113. <https://doi.org/10.2307/30035545>
- Lachapelle, Y., Wehmeyer, M. L., Haelewyck, M. C., Courbois, Y., Keith, K. D., Schalock, R., ... & Walsh, P. N. (2005). The relationship between quality of life and self-determination: an international study. *Journal of Intellectual Disability Research, 49*(10), 740-744. <https://doi.org/10.1111/j.1365-2788.2005.00743.x>
- Lee, S. H., Wehmeyer, M. L., Palmer, S. B., Soukup, J. H., & Little, T. D. (2008). Self-determination and access to the general education curriculum. *The Journal of Special Education, 42*(2), 91-107. doi: 10.1177/0022466907312354
- Luckasson, R., Borthwick-Duffy, S., Buntinx, W. H., Coulter, D. L., Craig, E. M. P., Reeve, A., ... Tassé, M. J. (2002). *Mental retardation: Definition, classification, and systems of supports.* Washington, DC: American Association on Mental Retardation.
- Luckasson, R., Coulter, D. L., Polloway, E. A., Reiss, S., Schalock, R. L., Snell, M. E., Spitalnick, D. M., & Stark, J. A. (1992). *Mental retardation: Definition,*

- classification, and systems of supports* (9th Edition). Washington, DC: American Association on Mental Retardation.
- Malian, I., & Nevin, A. (2002). A review of self-determination literature: Implications for practitioners. *Remedial and Special Education, 23*(2), 68-74.  
<https://doi.org/10.1177/074193250202300202>
- Martin, J., Huber-Marshall, L., Maxton, L. Jerman, P., & Miller, T. L. (1996). *The Self-directed IEP*. Longmont, CO: Sopris West.
- Martin, J. E., & Marshall, L. H. (1995). ChoiceMaker: A comprehensive self-determination transition program. *Intervention in School and Clinic, 30*(3), 147-156. <https://doi.org/10.1177/105345129503000304>
- McDougall, J., Evans, J., & Baldwin, P. (2010). The importance of self-determination to perceived quality of life for youth and young adults with chronic conditions and disabilities. *Remedial and Special Education, 31*(4), 252-260.  
<https://doi.org/10.1177/0741932509355989>
- McGuire, J., & McDonnell, J. (2008). Relationships between recreation and levels of self-determination for adolescents and young adults with disabilities. *Career Development for Exceptional Individuals, 31*(3), 154-163.  
<https://doi.org/10.1177/0885728808315333>
- Mithaug, D. E., Mithaug, D. K., Agran, M., Martin, J. E., & Wehmeyer, M. L. (2002). *Self-determined learning theory: Construction, verification and evaluation*. Mahwah, N. J.: Lawrence Erlbaum Associates, Publishers.
- Morningstar, M. E., Lombardi, A., Fowler, C. H., & Test, D. W. (2017). A college and career readiness framework for secondary students with disabilities. *Career Development and Transition for Exceptional Individuals, 40*(2), 79-91.  
<https://doi.org/10.1177/2165143415589926>
- Mumbardó-Adam, C., Guàrdia-Olmos, J., Adam-Alcocer, A. L., Carbó-Carreté, M., Balcells-Balcells, A., Giné, C., & Shogren, K. A. (2017). Intellectual Disability

- Classification, Self-Determination and Context: A Meta-analytic study. *Intellectual and Developmental Disabilities*, 55(5), 303–314. <https://doi.org/10.1352/1934-9556-55.5.303>
- Mumbardó-Adam, C., Guàrdia-Olmos, J., Giné, C., Shogren, K. A. & Vicente, E. (in press). Psychometric properties of the Spanish version of the Self-Determination Inventory Student Self-Report: a Structural Equation Modeling Approach. *American Journal on Intellectual and Developmental Disabilities*.
- Mumbardó-Adam, C., Guàrdia-Olmos, J., & Giné, C. (2018a). Exploring the impact of disability on self-determination measurement. *Research in Developmental Disabilities*, 78, 27-34. <https://doi.org/10.1016/j.ridd.2018.04.022>
- Mumbardó-Adam, C., Guàrdia-Olmos, J., & Giné, C. (2018b). Assessing self-determination in youth with and without disabilities: The Spanish version of the AIR self-determination scale. *Psicothema*, 30(2), 238-243. <https://doi.org/10.7334/psicothema2017.349>
- Mumbardó-Adam, C., Guàrdia-Olmos, J., & Giné, C. (2018c). An integrative model of self-determination latent trait and related contextual variables. *Manuscript submitted for publication*.
- Mumbardó-Adam, C., Guàrdia-Olmos, J., Giné, C., Raley, S. K., & Shogren, K. A. (2017). The Spanish version of the Self-Determination Inventory Student Report: application to Item Response Theory to self-determination measurement. *Journal of Intellectual Disability Research*. <https://doi.org/10.1111/jir.12466>
- Mumbardó-Adam, C., Vicente, E., Giné, C., Guàrdia-Olmos, J., Raley, S. K., & Verdugo, M. A. (2017). Promoviendo la autodeterminación en el aula: el Modelo de Enseñanza y aprendizaje de la autodeterminación. [Promoting self-determination skills in the classroom: The Self-determined Learning Model of Instruction (Spanish version)]. *Siglo Cero*, 48(2). <https://doi.org/10.14201/scero20174824159>.

- Nirje, B. (1972). The right to self-determination. In W. Wolfensberger, (Ed.), *Normalization: The principle of normalization* (pp. 176 - 200). Toronto: National Institute on Mental Retardation.
- Ponce, A. (2010). *Formación en autodeterminación para familias [Self-determination training for families]*. Madrid: FEAPS, Cuaderno de Buenas Prácticas.
- Powers, L., Sowers, J., Turner, A., Nesbitt, M., Knowles, E., & Ellison, R. (1996). TAKE CHARGE: A model for promoting self-determination among adolescents with challenges. In L. E. Powers, G. H. S. Singer, & J. Sowers (Eds.), *Promoting self-competence in children and youth with disabilities* (pp. 291-322). Baltimore: Paul H. Brookes.
- Ryan, R. M., & Deci, E. L. (2000). Self-determination theory and the facilitation of intrinsic motivation, social development, and well-being. *American psychologist*, *55*(1), 68-78. <https://doi.org/10.1037//0003-066x.55.1.68>
- Schalock, R.L. (1996). Reconsidering the conceptualization and measurement of quality of life. In R. L. Schalock (Ed.), *Quality of life: Vol. 1. Conceptualization and measurement*. Washington, DC: American Association on Mental Retardation.
- Schalock, R. L., Borthwick-Duffy, S. A., Bradley, V. J., Buntinx, W. H. E., Coulter, D. L., Craig, E. M., ... Yeager, M. H. (2010). *Intellectual Disability: Definition, Classification, and Systems of Supports*. Washington, DC: American Association on Intellectual and Developmental Disabilities.
- Schalock, R. L., Brown, I., Brown, R., Cummins, R. A., Felce, D., Matikka, L., Keith, K. D., & Parmenter, T. (2002). Conceptualization, Measurement, and Application of Quality of Life for Persons with Intellectual Disabilities: Report of an International Panel of Experts. *Mental Retardation*, *40*(6), 457-470. [https://doi.org/10.1352/0047-6765\(2002\)040<0457:CMAAOQ>2.0.CO;2](https://doi.org/10.1352/0047-6765(2002)040<0457:CMAAOQ>2.0.CO;2)
- Schalock, R. L., Luckasson, R., Tassé, M. J., & Verdugo, M. A. (2018). A holistic approach to Intellectual Disability: going beyond the four current perspectives.

*Intellectual and Developmental Disabilities*, 56(2), 79-89.

<https://doi.org/10.1352/1934-9556-56.2.79>.

Schalock, R. L. & Verdugo, M. A. (2002/2003). *Quality of life for human service practitioners*. Washington, DC: American Association on Mental Retardation.

Schalock, R. L. & Verdugo, M. A. (2007). El concepto de calidad de vida en los servicios y apoyos para personas con discapacidad intelectual. [The Concept of Quality of Life in Services and Supports for Persons with Intellectual Disabilities]. *Siglo Cero*, 38(4), 224, 21-36.

Schalock, R. L., Verdugo, M. A., Gomez, L. E., & Reinders, H. S. (2016). Moving us toward a theory of individual quality of life. *American journal on intellectual and developmental disabilities*, 121(1), 1-12. <https://doi.org/10.1352/1944-7558-121.1.1>

Schalock, R. L., Verdugo, M. A., Jenaro, C., Wang, M., Wehmeyer, M., Jiancheng, X., & Lachapelle, Y. (2005). Cross-cultural study of quality of life indicators. *American Journal on Mental Retardation*, 110(4), 298-311. [https://doi.org/10.1352/0895-8017\(2005\)110\[298:csqol\]2.0.co;2](https://doi.org/10.1352/0895-8017(2005)110[298:csqol]2.0.co;2)

Self-determination Inventory: Self-Report (SDI:SR) Student Report Guide. (n.d.).

Retrieved from: [http://www.selfdetermination.dept.ku.edu/wp-content/uploads/2016/03/SDI-Student-Report-Guide\\_small.Final\\_.pdf](http://www.selfdetermination.dept.ku.edu/wp-content/uploads/2016/03/SDI-Student-Report-Guide_small.Final_.pdf)

Shogren, K. A. (2013). A socio-ecological analysis of the self-determination literature. *Intellectual and Developmental Disabilities*, 51(6), 496-511. <https://doi.org/10.1352/1934-9556-51.6.496>.

Shogren, K. A., & Broussard, R. (2011). Exploring the perceptions of self-determination of individuals with intellectual disability. *Intellectual and Developmental Disabilities*, 49(2), 86-102. <https://doi.org/10.1352/1934-9556-49.2.86>.

Shogren, K. A., Faggella-Luby, M. N., Bae, S. J., & Wehmeyer, M. L. (2004). The effect of choice-making as an intervention for problem behavior: A meta-analysis.

*Journal of Positive Behavior Interventions*, 6(4), 228-237.

<https://doi.org/10.1177/10983007040060040401>

Shogren, K. A., Garnier-Villarreal, M., Lang, K., & Seo, H. (2017). Mediating Role of Self-Determination Constructs in Explaining the Relationship Between School Factors and Postschool Outcomes. *Exceptional Children*, 83(2), 165-180. <https://doi.org/10.1177/0014402916660089>

Shogren, K. A., Little, T. D., Grandfield, B., Raley, S. K., Wehmeyer, M. L., Lang, K., & Shaw, L. A. (in press). The Self-Determination Inventory-Student Report: Identification of items for a new measure of self-determination. *Assessment for Effective Intervention*.

Shogren, K. A., Little, T. D., & Wehmeyer, M. L. (2017). Human agentic theories and the development of self-determination. In M. L. Wehmeyer, K. A. Shogren, T. D. Little, & S. J. Lopez (Eds.), *Development of self-determination through the life-course* (pp. 17-26). New York: Springer.

Shogren, K. A., Lopez, S. J., Wehmeyer, M. L., Little, T. D., & Pressgrove, C. L. (2006). The role of positive psychology constructs in predicting life satisfaction in adolescents with and without cognitive disabilities. An exploratory study. *The Journal of Positive Psychology*, 1(1), 37–52. <https://doi.org/10.1080/17439760500373174>

Shogren, K. A., Luckasson, R., & Schalock, R. L. (2014). The definition of “context” and its application in the field of intellectual disability. *Journal of Policy and Practice in Intellectual Disabilities*, 11(2), 109-116. <https://doi.org/10.1111/jppi.12077>

Shogren, K. A., Palmer, S. B., & Wehmeyer, M. L. (2017). The Development of Self-Determination During Childhood. In M. L. Wehmeyer, K. A. Shogren, T. D. Little, & S. J. Lopez (Eds.), *Development of self-determination through the life-course* (pp. 71-88). New York: Springer.

- Shogren, K. A., Palmer, S. B., Wehmeyer, M. L., Williams-Diehm, K., & Little, T. D. (2012). Effect of intervention with the Self-Determined Learning Model of Instruction on access and goal attainment. *Remedial and Special Education, 33*(5), 320-330. <https://doi.org/10.1177/0741932511410072>
- Shogren, K. A., Plotner, A. J., Palmer, S. B., Wehmeyer, M. L., & Paek, Y. (2014). Impact of the self-determined learning model of instruction on teacher perceptions of student capacity and opportunity for self-determination. *Education and Training in Autism and Developmental Disabilities, 49*(3), 440-448.
- Shogren, K. A., Shaw, L. A., & Mumbardó-Adam, C. (in press). The Assessment of Self-Determination in Spanish and American Adolescents Using the Self-Determination Inventory: Student Report. *Intellectual and Developmental Disabilities.*
- Shogren, K. A., Seo, H., Seong, Y., & Wehmeyer, M. L. (2015b). *Short form of the Arc's self-determination scale - adult version*. Lawrence: Kansas University Center on Developmental Disabilities.
- Shogren, K. A., & Turnbull, A. P. (2006). Promoting self-determination in young children with disabilities: The critical role of families. *Infants & Young Children, 19*(4), 338-352. <https://doi.org/10.1097/00001163-200610000-00006>
- Shogren, K. A., Wehmeyer, M. L., Buchanan, C. L., & Lopez, S. J. (2006). The application of positive psychology and self-determination to research in intellectual disability: A content analysis of 30 years of literature. *Research and Practice for persons with Severe Disabilities, 31*(4), 338-345. <https://doi.org/10.1177/154079690603100408>
- Shogren, K. A., Wehmeyer, M. L., & Lane, K. L. (2016). Embedding interventions to promote self-determination within multitiered systems of supports. *Exceptionality, 24*(4), 213-224. <https://doi.org/10.1080/09362835.2015.1064421>

- Shogren, K. A., Wehmeyer, M. L., Little, T. D., Forber-Pratt, A. J., Palmer, S. B., & Seo, H. (2017). Preliminary validity and reliability of scores on the Self-Determination Inventory-Student Report version. *Career for Development and Transition for Exceptional Individuals*, 50(3), 251-263. <https://doi.org/10.1177/2165143415594335>
- Shogren, K. A., Wehmeyer, M. L., Palmer, S. B., Forber-Pratt, A. J., Little, T. D., & Lopez, S. (2015). Causal agency theory: reconceptualizing a functional model of self-determination. *Education and Training in Autism and Developmental Disabilities*, 50(3), 251-263. [https://doi.org/10.1007/978-94-024-1042-6\\_5](https://doi.org/10.1007/978-94-024-1042-6_5)
- Shogren, K. A., Wehmeyer, M. L., Palmer, S. B., Rifenshark, G. G., & Little, T. D. (2015). Relationships between self-determination and postschool outcomes for youth with disabilities. *Journal of Special Education*, 53, 30-41. <https://doi.org/10.1177/0022466913489733>
- Stang, K. K., Carter, E. W., Lane, K. L., & Pierson, M. R. (2009). Perspectives of general and special educators on fostering self-determination in elementary and middle schools. *The Journal of Special Education*, 43(2), 94-106. <https://doi.org/10.1177/0022466907313452>
- Tassé, M., Luckasson, R., & Schalock, R. L. (2016). The relation between intellectual functioning and adaptive behavior in the diagnosis of Intellectual Disability. *Intellectual and Developmental Disabilities*, 54(6), 381-390. <https://doi.org/10.1352/1934-9556-54.6.381>
- Thompson, J. R., Bradley, V., Buntinx, W. H. E., Schalock, R. L., Shogren, K. A., Snell, M. E., ... Yeager, M.H. (2009). Conceptualizing supports and the support needs of people with intellectual disability. *Intellectual and Developmental Disabilities*, 47, 135–146. <https://doi.org/10.1352/1934-9556-47.2.135>
- Verdugo M. A., Schalock R., Keith K. & Stancliffe R. (2005) Quality of life and its measurement: important principles and guidelines. *Journal of Intellectual*

*Disability Research*, 49(10), 707–17. <https://doi.org/10.1111/j.1365-2788.2005.00739.x>

Verdugo, M. A., Vicente, E., Fernández, R. Gómez-Vela, M., & Guillén, V. (2015). A psychometric evaluation of the ARC-INICO Self-Determination Scale for adolescents with intellectual disabilities. *International Journal of Clinical and Health Psychology*, 15(2), 149-159. <https://doi.org/10.1016/j.ijchp.2015.03.001>

Vicente, E., Mumbardó-Adam, C., Simó-Pinatella, D., & Coma, T. (2018). Understanding practitioners' needs to support self-determination of people with intellectual disability through the lifespan. *Manuscript in preparation*.

Vicente, E., Verdugo, M. A., Gómez-Vela, M., Fernández, R., & Guillén, V. (2015). Propiedades psicométricas de la Escala ARC-INICO para evaluar la autodeterminación. [Psychometric properties of the ARC-INICO scale to assess self-determination]. *Revista Española de Orientación y Psicopedagogía*, 26(1), 8-24. <https://doi.org/10.5944/reop.vol.26.num.1.2015.14339>

Vicente, E., Guillén, V. M., Gómez, L. E., Ibáñez, A., & Sánchez, S. (2018). What do stakeholders understand by self-determination? Consensus for its evaluation. *Journal of Applied Research of Intellectual Disability*. *Advanced online publication*. <https://doi.org/10.1111/jar.12523>

Vicente, E., Verdugo, M. A., Gómez-Vela, M., Fernández-Pulido, R., Wehmeyer, M. L., & Guillén, V. M. (2017). Personal characteristics and school contextual variables associated with student self-determination in Spanish context. *Journal of Intellectual & Developmental Disability*, 1-12. <https://doi.org/10.3109/13668250.2017.1310828>

Verdugo, M. Á., Vicente, E., Gómez-Vela, M., Fernández, R., Wehmeyer, M. L., Badia, M., González-Gil, F. & Calvo, M. I. (2015). *Escala ARC-INICO de Evaluación de la Autodeterminación: Manual de aplicación y corrección*. [The ARC-INICO self-determination scale: Manual of application and correction]. Salamanca: INICO.

- Wehmeyer, M. L. (1992). Self-determination and the education of students with mental retardation. *Education and Training in mental Retardation*, 27(4), 302-314.
- Wehmeyer, M. L. (1996). Self-determination as an educational outcome: Why is it important to children, youth and adults with disabilities? In D. J. Sands & M. L. Wehmeyer (Eds.), *Self-determination across the life span: Independence and choice for people with disabilities* (pp. 15-34). Baltimore: Brookes.
- Wehmeyer, M. L. (1999). A functional model of self-determination: Describing development and implementing instruction. *Focus on Autism and Other Developmental Disabilities*, 14, 53-61.  
<https://doi.org/10.1177/108835769901400107>
- Wehmeyer, M. L. (2003a). Self-determination: a review of the construct. In M. L. Wehmeyer, B. H. Abery, D. E. Mithaug & R. J. Stancliffe (Eds.) *Theory in Self-determination. Foundations for educational practice* (pp. 5-24). Springfield, Illinois: Thomas Publisher.
- Wehmeyer, M. L. (2003b). A functional theory of self-determination: Model overview. In M. L. Wehmeyer, B. H. Abery, D. E. Mithaug & R. J. Stancliffe (Eds.) *Theory in Self-determination. Foundations for educational practice* (pp. 182-201). Springfield, Illinois: Thomas Publisher.
- Wehmeyer, M. L. (2005). Self-determination and individuals with severe disabilities: Re-examining meanings and misinterpretations. *Research and Practice for Persons with Severe Disabilities*, 30(3), 113-120. <https://doi.org/10.2511/rpsd.30.3.113>
- Wehmeyer, M. L. (2014). Self-determination: A family affair. *Family Relations: Interdisciplinary journal of Applied Family Science*, 63(1), 178-184.  
<https://doi.org/10.1111/fare.12052>
- Wehmeyer, M. L., Abery, B. H., Zhang, D., Ward, K., Willis, D., Hossain, W. A., . . . Walker, H. M. (2011). Personal self-determination and moderating variables that

- impact efforts to promote self-determination. *Exceptionality*, 19, 19–30.  
<https://doi.org/10.1080/09362835.2011.537225>
- Wehmeyer, M. L. & Bolding, N. (1995). *The Arc's Self-determination Scale – Adult version*. Arlington, TX: The Arc of the United States.
- Wehmeyer, M. L. & Kelchner, K. (1995). *The Arc's Self-determination Scale*. Arlington, TX: The Arc of the United States.
- Wehmeyer, M. L., Kelchner, K., & Richards, S. (1996). Essential characteristics of self-determined behavior of individuals with mental retardation. *American Journal on Mental Retardation*, 100(6), 632-642.
- Wehmeyer, M., L., Lawrence, M., Kelchner, K., Palmer, S. B., Garner, N., & Soukup, J. H. (2004). *Whose Future Is It Anyway? A Student-Directed Transition Planning Process*. Lawrence, KS: Kansas University Center on Developmental Disabilities.
- Wehmeyer, M. L., Palmer, S. B., Agran, M., Mithaug, D. E., & Martin, J. (2000). Promoting causal agency: The Self-Determined Learning Model of Instruction. *Exceptional Children*, 66(4), 439-453.  
<https://doi.org/10.1177/001440290006600401>
- Wehmeyer, M. L., Palmer, S. B., Shogren, K. A., & Seong, Y. (2014). *The Arc's Self-Determination Scale-Short Form*. Lawrence: Kansas University Center on Developmental Disabilities.
- Wehmeyer, M. L., Palmer, S. B., Shogren, K. A., Williams-Diehm, K. L., & Soukup, J. H. (2013). Establishing a causal relationship between intervention to promote self-determination and enhanced student self-determination. *The Journal of Special Education*, 46(4), 195-210. <https://doi.org/10.1177/0022466910392377>
- Wehmeyer, M. L., Peralta, F., Zulueta, A., González-Torres, M. C., & Sobrino, A. (2006). *Escala de autodeterminación personal ARC. Instrumento de valoración y guía de aplicación. Manual Técnico de la adaptación española*. CEPE, Madrid.

Wehmeyer, M. L. & Shogren, K. A. (2017). The development of self-determination during adolescence. In M. L. Wehmeyer, K. A. Shogren, T. D. Little, & S. J. Lopez (Eds.), *Development of self-determination through the life-course* (pp. 89-98). New York: Springer.

Wehmeyer, M. L., Shogren, K. A., Palmer, S. B., Williams-Diehm, K. L., Little, T. D., & Boulton, A. (2012). The impact of the self-determined learning model of instruction on student self-determination: A randomized-trial placebo control group study. *Exceptional Children*, *78*(2), 135-153.  
<https://doi.org/10.1177/001440291207800201>

Wolman, J. M., Campeau, P. L., DuBois, P. A., Mithaug, D. E., & Stolarski, V. S. (1994). *Air Self-Determination Scale and User Guide*. Columbia: American Institutes for Research.

Aquesta Tesi Doctoral ha estat defensada el dia \_\_\_\_ d\_\_\_\_\_ de 201\_\_  
al Centre\_\_\_\_\_

de la Universitat Ramon Llull, davant el Tribunal format pels Doctors i Doctores  
sotasignants, havent obtingut la qualificació:

President/a

\_\_\_\_\_

Vocal

\_\_\_\_\_

Vocal \*

\_\_\_\_\_

Vocal \*

\_\_\_\_\_

Secretari/ària

\_\_\_\_\_

Doctorand/a

\_\_\_\_\_

*(\*): Només en el cas de tenir un tribunal de 5 membres*