



Self-Determination of Students with Autism Spectrum Disorder: A Systematic Review

M^a Lucía Morán, et al. *[full author details at the end of the article]*

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Abstract

Although research shows that students with autism spectrum disorder (ASD) can develop abilities and skills associated with self-determination (e.g., decision making, problem solving, goal setting and attainment) when opportunities and supports are provided, students with ASD tend to show lower levels of self-determination compared to their peers without disabilities or with other disabilities. Researchers have suggested that common ASD characteristics may influence the development and expression of self-determination and that there may be less focus on self-determination and its development in ASD. Therefore, the aim of this review was to investigate existing studies that examined factors impacting the development of self-determination for students with ASD or implemented self-determination interventions with students with ASD. We reviewed existing empirical studies related to self-determination and students with ASD published in peer-reviewed journals. We examined the thematic categories of research studies, rigor of research, and influential factors. Among the 18 included studies, three distinct thematic categories were identified: (a) intervention research, (b) stakeholders' perceptions, and (c) contextual analysis. Intervention articles were the most prevalent, followed by articles that reported stakeholders' perceptions. Contextual analysis articles were less common. Several factors have been identified that influence student self-determination (e.g. age, gender, hours spent with peers, educational placement). This review suggests that self-determination of students with ASD can be promoted through instructional methods, and there are personal and environmental factors that are important to consider when supporting the self-determination of students with ASD. However, there is a need for enhanced rigor of research in future studies.

Keywords Self-determination · Autism spectrum disorder · Systematic review · Self-determination intervention · Contextual factors

In the special education field, promoting self-determination for students with disabilities is an identified best practice (Soresi et al. 2011; Wehman 2012; Wehmeyer and

Shogren 2016). Causal Agency Theory defines self-determination as “a dispositional characteristic manifested as acting as the causal agent in one’s life” (Shogren et al. 2015a, p. 258). This theoretical framework represents an extension of the functional model of self-determination (Wehmeyer 1999) and incorporates contributions from the positive psychology field as well as emphasizes the need for self-determination instruction for *all* students, inclusive of students with and without disabilities (Shogren et al. 2015a). Self-determination is a dispositional characteristic that all people have regardless of cognitive functioning (Abery and Stancliffe 2003; Shogren et al. 2015a). Hence, all students benefit from opportunities that promote self-determination (Burke et al. 2020; Cobb et al. 2009; Shogren et al. 2014b).

Research has found a link between self-determination and positive in-school (Lee et al. 2010; Shogren et al. 2012) and post-school outcomes such as advancing to higher education, gaining employment, and community participation (Shogren et al. 2015b, 2016; Shogren and Ward 2018; Wehmeyer and Palmer 2003). Additionally, self-determination has been associated with positive recreation and leisure outcomes (McGuire and McDonnell 2008), improved behavioral outcomes (Carter et al. 2013a), and enhanced quality of life (Lachapelle et al. 2005; Nota et al. 2007; Schalock et al. 2016). With regard to students with ASD, research has suggested the importance of self-determination interventions that address language and cognitive support needs (Hodgetts and Park 2017; Wehmeyer et al. 2010). However, research has also suggested that children and youth with ASD have limited opportunities and supports to engage in self-determined actions in their environments (Wehmeyer and Shogren 2008). Not unsurprisingly, then, researchers have found lower levels of self-determination for students with ASD in comparison with their peers without disabilities (Shogren et al. 2018b) and with other disabilities (Chou et al. 2017; Shogren et al. 2018a). These findings highlight the need for targeted instructional strategies focused on enhancing critical self-determination abilities and skills for youth with ASD (e.g., decision making, problem solving, goal setting and attainment; Cote et al. 2014; Hodgetts and Park 2017; Wehmeyer 1999; Wehmeyer et al. 2010).

Furthermore, poor post-school outcomes have been identified in young adults with ASD (Neary et al. 2015). For instance, young people with ASD have low rates of postsecondary education enrollment, employment (Shattuck et al. 2012), and independent living (Anderson et al. 2014). Because self-determination status and life outcomes are positively related for people with ASD (Kim 2019; White et al. 2018), promoting self-determination has the potential to impact these poor post-school outcomes. While several characteristics of persons with ASD (e.g., social and communication skills) may impact the development of self-determination (Field and Hoffman 1999; White et al. 2018), there is clear evidence that students with ASD can develop self-determination abilities and skills when provided supports and accommodations (Wehmeyer and Shogren 2008). Thus, their specific needs and characteristics must be taken into account when providing self-determination interventions and supports to promote self-determination (Wehmeyer et al. 2010).

Although previous studies have implemented self-determination interventions for students with ASD or examined how they engage in self-determined actions (e.g., Fullerton and Coyne 1999; Hagner et al. 2012), there has not been a literature review to comprehensively examine self-determination of children and

adolescents with ASD. Given this gap in the research literature, the aim of this review was to examine the existing self-determination literature that includes children and youth with ASD to provide guidance for future research and practice on designing instruction to promote self-determination of students with ASD. The following research questions guided this systematic review:

Research Question 1. What are the thematic categories in empirical studies related to self-determination for students with ASD?

Research Question 2. What are the key findings of each thematic category related to self-determination of students with ASD?

Research Question 3. What is the rigor of the body of research on interventions and strategies that support self-determination of students with ASD?

Research Question 4. What significant personal and environmental factors related to self-determination of students with ASD have been reported?

Method

Inclusion Criteria

The criteria for inclusion in this literature review were that (a) studies had to focus on overall self-determination of children and youth with ASD, (b) samples must have included at least one participant with ASD aged between 5 and 21 years old in K-12 or 18–21, school-based settings, (c) articles had to be peer-reviewed, (d) empirical (i.e., reporting quantitative or qualitative outcomes), and (e) written in English. A date range was not included given that a review on this topic has not been conducted previously.

Search Strategy

To reach consensus on the most effective search strategy, the research team comprehensively considered research databases, inclusion criteria, and search terms and strategies. In October 2019, a systematic literature search was completed and focused on peer-reviewed articles and scholarly journals indexed in the electronic databases Education Resources Information Center (ERIC) and PsycInfo (two of the largest for English-written education literature) in any year of publication. The criteria used for database selection was focusing on participants with ASD receiving educational services in school-based settings. The search terms were self-determin* AND (autis* OR asperger* OR pervasive development) AND (child* OR adolescen* OR student OR youth OR young). This search yielded in 221 records. After duplicates were removed, the first author screened 186 articles by title and abstract based on the inclusion criteria. To demonstrate inter-rater reliability, approximately 25% of the screened articles ($n=47$ articles) were randomly selected using a web-based random number generator. The percentage of interrater agreement was obtained by dividing the number of agreements by the number of agreements plus disagreements multiplied by 100. The agreement between the first author and a second rater with knowledge

of self-determination and ASD was 89.4%. Discrepancies identified were discussed until a consensus was achieved for each disagreement.

Eighty-one articles were selected for review by full text, and approximately 25% ($n = 21$ articles) were randomly selected for screening for inter-rater reliability using the same web-based random number generator utilized previously. Initial agreement among randomly selected articles was 80.9%. Discrepancies identified were discussed until a consensus was achieved for each disagreement. Ultimately, 11 articles from electronic databases were identified that met inclusion criteria. Then, we conducted a manual search with in-press articles in all the journals indexed in Journal Citation Reports that included the terms “autis*” or “disabilit*” in their titles and an ancestral search of references across included articles. Through this process, three more articles were identified. Further, one of the co-authors, who is an expert in self-determination and disability, examined the reference list and proposed two other relevant articles. As the analysis was moving forward, two new articles published in March and August 2020 were identified and added. Consequently, a total of 18 articles met the inclusion criteria. Fig. 1 shows the Preferred Reporting Items for Systematic Reviews and Meta-analysis (PRISMA) flow diagram of the search process (Moher et al. 2009).

Article Coding

The research team developed a coding system that included four overall categories: thematic category (see Table 1), sociodemographic data, contextual factors and, when applicable, characteristics of the interventions. The sociodemographic information included: (a) sample size; (b) ages or grade levels, gender, race/ethnicity, and socio-economic status of participants with ASD; (c) severity level of ASD and comorbid disabilities; (d) type of respondent; and (e) setting. Interventions had to measure self-determination as an outcome. The characteristics of interventions were: (a) intervention length and session duration; (b) implementer role (e.g., teacher, research team member); (c) research design; (d) measures used; (e) dependent variables; (f) outcomes, including effect sizes and social validity; and (g) quality indicators (QIs). QIs were only applicable to intervention articles and we utilized the QIs proposed by the Council for Exceptional Children (CEC, 2014) and assessed by Cook et al. (2015) for group and single-case design studies. Two articles were not considered given that they were single-case AB (i.e., baseline-intervention) designs (CEC 2014). The nine remaining articles were group designs. QI subgroups were: (a) context and setting, (b) participants, (c) intervention agents, (d) description of practice, (e) implementation fidelity, (f) internal validity, (g) outcome measure/dependent variables, and (h) data analysis. Each QI category included 24 criteria that were coded for group designs. Each article was evaluated to determine whether each criterion was or not reported. Given that other research reviews in the field of education have highlighted challenges in meeting all the QI criteria (Lane et al. 2009), we adopted an evaluation criteria used in prior studies that requires studies to meet 80% of QI to be considered methodologically sound (Royer et al. 2017). An inter-rater agreement between the first author and a second rater was assessed for 44% of the 18 included articles ($n = 8$). Interrater agreement was 95.2%. Disagreements were discussed until a consensus was reached for each discrepancy.

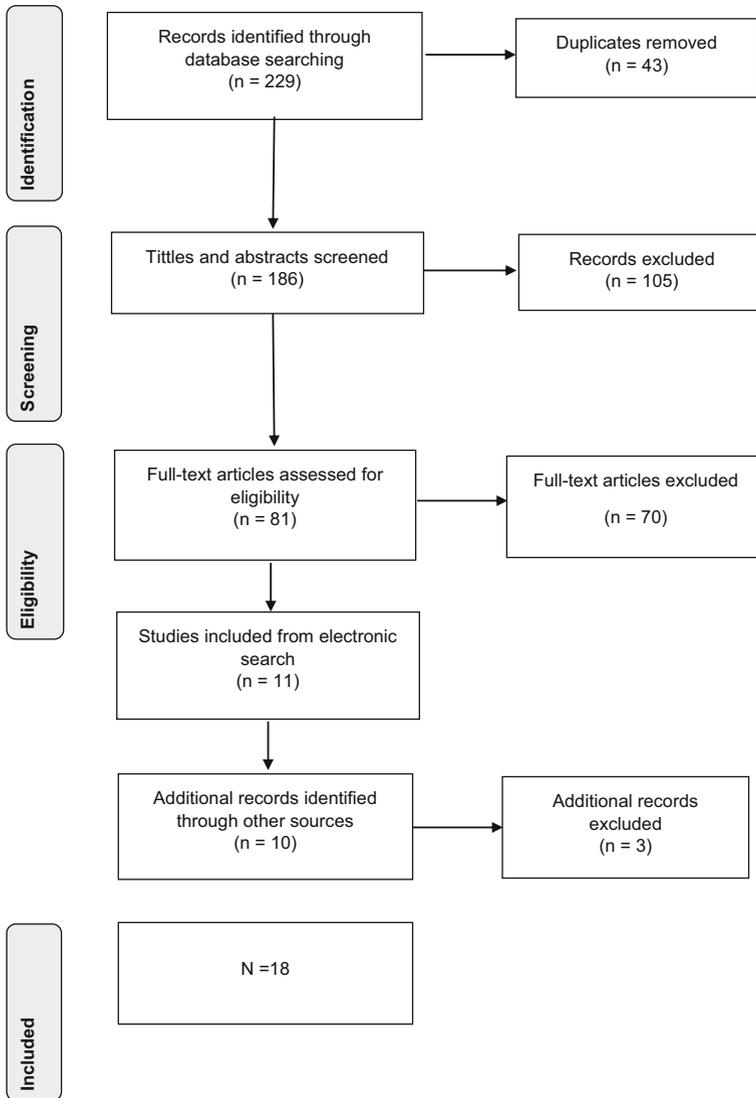


Fig. 1 PRISMA Flow Diagram of the Search Process

Table 1 Description of Thematic Categories

Thematic category	Description
Contextual analysis	Articles that examine the effect of personal or environmental factors on self-determination outcomes.
Intervention	Articles that report data about the implementations of interventions to enhance self-determination outcomes.
Stakeholders' perceptions	Articles that provide information about perceptions of different stakeholders (parents, teachers, caregivers) concerning self-determination outcomes.

Table 2 Summary of Overall Self-Determination Literature

Type	Author (year)	Participants with ASD	Measure/ intervention	Main findings
Intervention	Chou (2020)	<i>N</i> = 44 (100%)	Self-Directed Social Problem-Solving Model	Students who received the instruction made improvements in overall self-determination although results were not significant.
	Fullerton and Coyne (1999)	<i>N</i> = 23 (100%)	PFID	After the participation, students with ASD (and their parents) reported being able to plan the steps needed for goal accomplishment and engaged in self-directed actions toward goals.
	Hagner et al. (2012)	<i>N</i> = 47 (100%)	Family-centered transition program	The transition program resulted in significant gains in self-determination of students with ASD.
	Hatfield et al. (2017b)	<i>N</i> = 94 (100%)	BOOST-A™	Significant differences were not found in overall self-determination. There was preliminary evidence of effectiveness in transition-specific self-determination and opportunities for self-determination in the home environment for adolescents with ASD.
	Held et al. (2004)	<i>N</i> = 1 (100%)	Next S.T.E.P., SDLMI	The self-determination curriculum combined with person-centered planning methods, a self-instructional model, the use of technology and the integration of instruction promoted the self-determination of a student with ASD in transition planning.

Table 2 (continued)

Type	Author (year)	Participants with ASD	Measure/ intervention	Main findings
Intervention (continued)	Kramer et al. (2018)	<i>N</i> = 41 (50%)	Project TEAM	Although project TEAM and goal setting group achieved significant enhancements in self-determination, improvements in parent reported self-determination remained at follow-up only for participants in the Project TEAM. Additionally, significantly more Project TEAM participants attained their participation goals after the intervention.
	Nadig et al. (2018)	<i>N</i> = 26 (100%)	McGill Transition Support Program	Self-determination total score was higher for the intervention than the waitlist control group. However, only the Interpersonal Cognitive Problem-Solving subdomain was found to demonstrate a positive effect of intervention in participants with ASD.
	Shogren et al., 2018a	<i>N</i> = 37 (10%)	SDLMI, WF	Students with intellectual disability in the SDLMI-only condition reported significant gains in their self-determination over the course of the year. Teachers reported significant changes in student self-determination in the SDLMI + WF condition.
	Shogren et al. (2020)	<i>N</i> = 31 (13%)	SDLMI, WF	After the initial year of implementation, the SDLMI + WF condition predicted greater annual increases in self-determination than the SDLMI only condition in students with intellectual disability.
	Wehmeyer et al. (2011b)	<i>N</i> = 27 (5%)	WFA	The intervention had a causal, positive effect on self-determination and transition knowledge and skills of students with disabilities.
Stakeholders' perceptions	Carter et al. (2009)	<i>N</i> = 14 (10%)	AIR	Teachers rated the ability of adolescents with severe intellectual and developmental disabilities to engage in self-determination behaviors more favorably than did parents. Both agreed that opportunities to perform self-determination were available.
	Carter et al. (2013a)	<i>N</i> = 333 (53%)	AIR and a written survey	Parents placed high levels of importance their adolescent children with disability learning self-determination skills, although they generally indicated their children did not perform these skills well. Several factors predicted third reported self-determination.
	Carter et al. (2013b)	<i>N</i> = 15 (23%)	AIR and a written survey	Parents emphasized on the importance of all self-determination skills. Yet, they reported their young adult children did not often carry out these skills properly.

Table 2 (continued)

Type	Author (year)	Participants with ASD	Measure/ intervention	Main findings
	Cheak-Zamora et al. (2020)	<i>N</i> = 479 (100%)	AIR	Parents reported a breakdown in self-determination skill-building of youth with ASD. Those with associated intellectual disability or severe symptomology experienced significant disparities in self-determination.
	Tomaszewski et al. (in press)	<i>N</i> = 547 (100%)	AIR	Students with ASD reported higher levels of capacity for self-determination than parents and educators. Students and parents reported significantly fewer opportunities at school than different opportunities at home. Adaptive behavior predicted self-determination.
Contextual analysis	Chou et al. (2017)	<i>N</i> = 74 (33%)	SDS	Students with ASD presented significantly lower levels of autonomy in comparison with students with intellectual or learning disability and, significantly lower levels of psychological empowerment than students with learning disability.
	Shogren et al. (2018b)	<i>N</i> = 230 (5%)	SDI	Students with ASD who were African American and Hispanic or Latinx showed the largest differences in scores compared with their peers not eligible for free and reduced-price lunch.
Contextual analysis and intervention	Lee et al. (2012)	<i>N</i> = 7 (4%)	SDS, AIR/ WFA	Dispositional, instructional and knowledge factors were stronger predictors of students with disabilities' self-determination than personal predictor variables (e.g. age, gender, IQ group)

Note. AIR = AIR Self-Determination Scale; BOOST-A™ = Better Outcomes & Successful Transitions for Autism; PFD = Putting feet on my dreams; SDLMI = Self-Determined Learning Model of Instruction; SDI = Self-determination Inventory; SDS = The Arc's Self-Determination Scale; S.T.E.P. = Student Transition and Education Planning; TEAM = Teens making Environment and Activity Modifications; WF = Whose Future is it?; WFA = Whose Future is it Anyway?

Results

A total of 18 studies met the inclusion criteria (Table 2). Eight studies (44.4%) only targeted participants with ASD, two studies (11.2%) included students with varying disability labels, but separately reported results for students with ASD, and eight studies (44.4%) did not separately provide outcomes for participants with ASD although students with ASD were included in the sample. The years of publication ranged from 1999 to 2020, and the highest number of articles ($n = 4$) were published in 2018. The most frequently represented country was the United States ($n = 15$ articles), followed by Australia ($n = 1$ article), Canada ($n = 1$ article), and Taiwan ($n = 1$ article). Included studies comprised a total of 67 authors. The most prolific authors were M. L. Wehmeyer ($n = 4$ articles) and K. A. Shogren ($n = 4$ articles), followed by S. B. Palmer and E. W. Carter, who had three publications each. Studies were published across 11 journals, mainly in *Focus on Autism and Other Developmental Disabilities* ($n = 4$), *American Journal on Intellectual and Developmental Disabilities* ($n = 3$), and *Research and Practice for Persons with Severe Disabilities* ($n = 2$).

Research Question 1: Thematic Categories in Empirical Studies Related to Self-Determination for Students with ASD

Among the key thematic categories identified across included articles, intervention articles were the most prevalent ($n = 10$; 55.5%), followed by articles that reported stakeholders' perceptions ($n = 5$; 27.8%). Contextual analysis articles were less common ($n = 2$; 11.1%), and a combined category was created for the only article that comprised both intervention and contextual analysis ($n = 1$; 5.6%).

Research Question 2: Key Findings of Thematic Categories Related to Self-Determination of Students with ASD

Thematic Category 1: Intervention Research

Characteristics of Intervention Studies Eleven studies (64.7%) used instructional methods aimed at enhancing self-determination of children and youth with ASD. The total ASD sample size across articles was 378 participants. Articles included children and youth between 12 and 29 years. There were 168 males (44.5%) and 50 females (13.2%), although gender was not specified for 160 participants (42.3%). Regarding race and ethnicity, 48 participants were identified as White/European American (12.7%) in two studies (18.1%; e.g., Hagner et al. 2012), but the majority of studies did not provide this information for participants with ASD ($n = 330$; 87.3%). Some participants were reported to have concomitant intellectual disability ($n = 31$; 8.2%) and others did not have intellectual disability ($n = 120$; 37.7%). However, for more than half of the participants ($n = 227$; 60.1%), it was not clear if they had an additional diagnosis. Interventions were implemented in inclusive settings in two studies (18.1%; e.g., Chou 2020), and more than half of the studies included participants in high schools ($n = 6$; 54.5%). Some of them targeted a combination of students at the middle and high school level ($n = 2$; 18.1%; e.g., Lee et al. 2012), whereas three studies only reported that

students were enrolled in schools and school districts ($n = 3$; 27.3%; e.g., Kramer et al. 2018).

Articles targeted self-determination of students with ASD through ten different interventions: (1) Better Outcomes & Successful Transitions for Autism (BOOST-A™; Hatfield et al. 2017a), (2) Family-centered Transition Program (Hagner et al. 2012), (3) McGill Transition Support Program (Nadig et al. 2018), (4) Putting feet on my dreams (PFD; Fullerton 1994), (5) Project Teens making Environment and Activity Modifications (Project TEAM; Kramer et al. 2018), (6) Self-Determined Learning Model of Instruction (SDLMI; Wehmeyer et al. 2000), (7) Self-Directed Social Problem-Solving Model Intervention (Chou 2020), (8) Student Transition and Education Planning (Next S.T.E.P; Halpern et al. 1997); (9) Whose Future is it? (WF; Wehmeyer and Palmer 2011) and (10) Whose Future is it Anyway? (WFA; Wehmeyer et al. 2004). The first four interventions (BOOST-A™, Family-centered Transition Program, McGill Transition Program and PFD) were ASD-specific programs and one intervention (Project TEAM) was designed for people with cognitive disabilities, whereas the last four interventions (SDLMI, Next S.T.E.P, WF and WFA) were designed for people with and without disabilities. However, this information was not provided for Self-Directed Social Problem-Solving Model Intervention. Four methods (SDLMI, Self-Directed Social Problem-Solving Model Intervention, WF and WFA) targeted children and youth, whereas the six remaining interventions (BOOST-A™, McGill, Project TEAM, Next STEP, PFD, Family-centered Transition Program) were designed for adolescents and youth in transition-age. The instructional methods most used were SDLMI ($n = 3$ articles), WF ($n = 2$ articles) and WFA ($n = 2$ articles).

Three studies (27.2%) combined two different interventions (Held et al. 2004; Shogren et al. 2020; Shogren et al. 2018a). The duration of interventions ranged from eight weeks (Held et al. 2004) to two years (Shogren et al. 2020). Instructional methods were implemented by teachers in eight studies (72.7%), project staff delivered the intervention in two studies (18.1%), while a computer-based intervention was used in one study (9.0%). Nine studies (81.8%) measured changes in overall self-determination using validated measures: (1) AIR Self-Determination Scale (AIR; Wolman et al. 1994); (2) School-Age Students Self-Determination Scale (SAS-SDS; Chao 2011); (3) Self-Determination Inventory (SDI; Shogren and Wehmeyer 2017) and (4) The Arc's Self-Determination Scale (SDS; Wehmeyer and Kelchner 1995), while two studies used interviews and observations (e.g., Fullerton and Coyne 1999). Six studies (54.5%) provided specific results for participants with ASD. Social validity was only assessed in two studies (18.1%; e.g., Nadig et al. 2018).

Outcomes of Intervention Studies Five of eleven intervention studies (45.4%) showed a significant increase in overall self-reported self-determination; the interventions used in these studies included the Family-centered transition program (Hagner et al. 2012), WFA (e.g., Lee et al. 2012), SDLMI and WF (e.g., Shogren et al. 2018a). For the latter two interventions, although most of the changes were focused in the SDLMI-only condition over one year (Shogren et al. 2018a), the SDLMI + WF condition predicted higher annual gains in self-determination after the initial year of intervention (Shogren et al. 2020). In addition, one study (9.0%) using the Project TEAM showed overall self-determination gains as reported by parents, but not by students (Kramer et al. 2018).

Further, two studies (18.1%) reported non-significant changes in student reported self-determination (e.g., Chou et al. 2020) and one study found a significant increase in the Interpersonal Cognitive Problem-Solving subdomain (Nadig et al. 2018). Regarding the two single-case studies that included 23 students with ASD, change in dependent measures suggested (a) improvements in planning for goal accomplishment and engagement in self-directed actions toward goals after PFD instruction (Held et al. 2004) and, (b) increases in self-determination skills using the Next Step Program and SDLMI combined with other strategies (i.e., person-centered planning, a self-instructional model, the use of technology and the integration of instruction) (Fullerton and Coyne 1999). Finally, the study using the BOOST-A™ did not find increases in overall self-determination, but there were preliminary findings suggesting the effectiveness of the instruction for adolescents with ASD in transition-specific self-determination and opportunities for self-determination at home, both as reported by parents.

Thematic Category 2: Stakeholders' Perceptions

Characteristics of Stakeholders' Perceptions Studies Five articles (27.8%) reported stakeholders' perceptions. The five studies included 1388 participants with ASD aged 5 to 25. The sample encompassed 1129 males (81.4%), 225 females (16.2%), and 3 transgender or non-conforming students (0.2%). For 31 participants (2.2%) gender information was not provided. The vast majority of participants were identified as White/European American ($n = 1062$; 76.5%), while others were African American/Black ($n = 118$; 8.5%), Hispanic/Latinx ($n = 41$; 2.9%), Asian American ($n = 30$; 2.2%) and other or multiple races ($n = 107$; 7.7%). This information was missing for 30 participants (2.2%). With regard to student disability category, 340 participants had concomitant intellectual disability (24.5%) whereas most of the participants had ASD without concomitant intellectual disability ($n = 1024$; 73.8%); however, this information was not provided for 24 participants (1.7%). Three studies (60%; e.g., Carter et al. 2009) included high school students and did not provide information about the type of setting (i.e. inclusive, segregated or both), whereas the other two studies (40%; e.g., Carter et al. 2013a) included students enrolled in school districts in segregated and inclusive settings. All the articles used the AIR Scale and two studies (50%) combined the AIR with an ad hoc survey (e.g., Carter et al. 2013b). In three studies (60%) respondents were parents, in one study (20%) scales were completed by parents and teachers (Carter et al. 2009) and in the remaining study (20%) assessments were fulfilled by students, educators, and parents. Scales were completed in writing.

Stakeholders' Perceptions of Student Self-Determination Although parents reported valuing the development of self-determination abilities and skills, they also reported their children perform these skills at low levels (Carter et al. 2013a, 2013b; Cheak-Zamora et al. 2020). Teachers' ratings of students' self-determination abilities and skills were higher than parents' ratings (Carter et al. 2009; Tomaszewski et al. *in press*). Nevertheless, students with ASD reported higher levels of capacity for self-determination than both parents and teachers (Tomaszewski et al. *in press*). Students and parents reported significantly fewer opportunities to utilize these abilities at school than educators, but not significantly different opportunities at home (Tomaszewski

et al. [in press](#)). Several factors were found to predict student reported self-determination; this information is explained further in the third research question.

Thematic Category 3: Contextual Analysis

Characteristics of Contextual Analysis Studies Three articles (17.6%) assessed contextual factors and their impact on self-determination in children and youth with ASD. The total sample size of students with ASD across the three studies was 311 participants ranging from 13 and 22 years old. The number of males ($n = 61$; 19.6%) was higher than the number of females ($n = 13$; 4.2%), albeit this data was not reported for most participants ($n = 237$; 76.2%). Regarding race/ethnicity, the majority of participants were identified as White/European American ($n = 202$; 64.9%), whereas others were Hispanic or Latinx ($n = 47$; 15.1%), African American/Black ($n = 31$; 10.0%), Native American ($n = 1$; 0.3%) and other race-ethnicity ($n = 23$; 7.4%). In one study, participants were attending school districts and postsecondary institutions in inclusive and segregated settings (33.3%; Shogren et al. [2018a](#)), whereas the other two studies (66.6%; Chou et al. [2017](#)) assessed a combination of students in middle and high school and did not provide information about the type of setting (i.e., inclusive, segregated, both). Included measures were student reports of the AIR, SDI, and SDS.

Results of Contextual Analysis Studies Main findings demonstrated the interactive effect of ASD diagnosis, race/ethnicity, and socioeconomic status on self-determination. More specifically, White students with ASD tended to score lower than those with ASD from other racial-ethnic backgrounds, contrary to predictions in the studies. However, when examining the additional predictive effects of socioeconomic status, results were most affected by eligibility for free and reduced-price lunch for students with ASD who identified as African American or Hispanic or Latinx (Shogren et al. [2018b](#)). In addition, dispositional, instructional and knowledge variables were predictors of self-determination in another study (Lee et al. [2012](#)). More information about these three latter variables is provided further in the third research question.

Research Question 3: Rigor of Research on Interventions for Students with ASD

Table 3 provides information on the extent to which the interventions studies ($n = 9$; 52.9%) demonstrated QIs for group research based on the information included in the article. Two intervention studies (11.7%) were not included in the Qis analysis since their designs used were single-case AB (i.e., baseline-intervention) and therefore, they did not meet the criteria established by the CEC ([2014](#)). The percentages of met indicators were calculated for the remaining studies. The average was 68% and the range varied from 42% (Hagner et al. [2012](#)) to 87% (Shogren et al. [2020](#)). Overall, when evaluating the nine studies based on the criteria for methodological soundness (i.e., meeting 80% of QI criteria; Lane et al. [2009](#)), Shogren et al. ([2020](#)) was the only included article that met this criterion. Additional data are given in Online Resource 1.

Among the studies, the QI categories with the highest adherence to the included criteria were description of practice (66%), which refers to the degree to which

Table 3 Council for Exceptional Children Quality Indicators and Sub-Indicators Assessment

Study	QIs									
	Context and setting	Participants	Intervention agent	Description of practice	Implementation fidelity	Internal validity	Outcome measures/dependent variables	Data analysis	Total QI met	
Chou (2020)	1	1/2	1/2	2/2	0/2	4/6	6/6	2/2	4	
Hagner et al. (2012)	0	1/2	0/2	0/2	1/3	5/6	2/6	1/2	0	
Hatfield et al. (2017b)	0	1/2	1/2	2/2	3/3	6/6	4/6	1/2	3	
Kramer et al. (2018)	0	2/2	2/2	1/2	1/3	5/6	4/6	1/2	2	
Lee et al. (2012)	0	1/2	1/2	2/2	0/2	4/6	5/6	2/2	2	
Nadig et al. (2018)	0	1/2	1/2	0/2	1/3	4/6	5/6	2/2	1	
Shogren et al. (2018b)	0	2/2	2/2	2/2	3/3	4/6	4/6	1/2	4	
Shogren et al. (2020)	0	2/2	2/2	2/2	3/3	4/6	6/6	2/2	6	
Wehmeyer et al. (2011b)	0	1/2	2/2	2/2	2/3	3/6	5/6	2/2	3	
Number of studies that met each QI	1	3	4	6	3	1	2	5		

Note: QI = quality indicators; Total QI met = number of QI where all criteria were met

information about critical features of the practice is provided so that it is clearly understood and can be reasonably replicated, data analysis (55%), which assesses the adequacy of data analysis and whether information on effect sizes is provided, and intervention agent (44%), which evaluate to what extent information regarding the critical features of the intervention agent is described. The QI categories with the lowest adherence were context and setting (11%), which refers to the degree to which enough information is provided on the context or setting (e.g. type of program or classroom, curriculum, geographic location, community setting, socioeconomic status), internal validity (11%), and outcome measures/dependent variables (22%), which addresses the impact of the practice on study outcomes and psychometrics of outcome measures.

Research Question 4: Factors Related to Self-Determination in the Included Studies

Table 4 shows personal and environmental factors found to influence self-determination of students that were reported in the included studies. These results were categorized by type of research (i.e. intervention, stakeholders' perceptions, contextual analysis). Across categories, studies focused more on personal factors than environmental factors. Age, gender and disability category were the most frequently identified personal factors that predicted self-determination in the included studies. In particular, young age (e.g. Wehmeyer et al. 2011b), male gender (e.g., Carter et al. 2013a) and having ASD (Chou et al. 2017) were related to lower self-determination. It is important to note that other personal factors were identified as impactful, although they were analyzed less frequently in the included research items (e.g., communication level, social skills). Regarding environmental factors, hours spent with peers, educational placement and student-directed transition planning instruction were identified as predicting self-determination. More specifically, receiving WFA instruction (Lee et al. 2012), spending hours with peers (Wehmeyer et al. 2011a) and more time in general education (Carter et al. 2013a) were related to higher self-determination.

Discussion

Although research has suggested that students with ASD have lower self-determination compared to students in other disability groups (Shogren et al. 2014a) as well as singular characteristics and specific needs in developing self-determination (Chou et al. 2017), a systematic review of overall self-determination of children and adolescents with ASD has not been conducted to inform research and practice. The purpose of this study was to address this gap by examining four research questions: (1) What thematic categories have been identified in empirical studies related to self-determination for students with ASD?; (2) What are the key findings of each thematic category related to self-determination of students with ASD?; (3) What was the rigor of the body of research on interventions and strategies that support self-determination of children and youth with ASD? and (4) What significant personal and environmental factors related to self-determination of students with ASD have been reported? Overall, self-determination research including participants with ASD has increased fourfold in the current decade, likely reflecting the increased focus on secondary education and transition in this population necessitated by the fact that between 2008 and 2017, there

Table 4 Influential Factors Related to Self-Determination in the Literature

Type of research	Author, year	Analysis performed to examine factors	Factor
			Personal
			Environmental
Intervention	Wehmeyer et al. (2011b)	MANCOVA	Age Gender Hours spent with peers
Stakeholders' perceptions	Carter et al. (2009)	Multiple regression	Level of IQ Social skills Problem behaviors
	Carter et al. (2013a)	Multiple regression	Disability severity Challenging behavior Educational placement
	Carter et al. (2013b)	Multiple regression	Age Gender Economic status Perceived disability Intellectual disability
	Cheak-Zamora et al. (2020)	Multiple regression	Symptom severity Frequency of symptoms Communication level Intellectual disability
	Tomaszewski et al. (in press)	Structural equation models	Adaptive behavior
Contextual Analysis	Chou et al. (2017)	MANCOVA	Disability category
	Shogren et al. (2018b)	Factor analysis	Interactive effect of disability, race-ethnicity, and socioeconomic status
Contextual analysis and intervention	Lee et al. (2012)	Multiple regression	Self-efficacy and outcome expectancy scores Students' preintervention transition planning knowledge Student-directed transition planning instruction

was a 147.8% increase in students with ASD served in secondary schools in the U. S (U.S. Department of Education 2020). However, in consonance with Tomaszewski et al. (in press), most of the studies about self-determination included participants with ASD as a subgroup. The identified research included a range of focus areas: (a) intervention research, (b) stakeholders' perspectives and (c) contextual analysis.

Ten instructional methods that targeted self-determination outcomes were evaluated in intervention studies that included participants with ASD. Around half of the studies found significant differences in overall self-determination in participants as an outcome of intervention. One study did not find an increased overall self-determination, while two studies found a non-significant increase in self-determination as a result of the intervention. Two single-case studies reported improvements in self-determination. Overall, the review provided preliminary information suggesting that students with ASD can benefit from intervention designed to promote student self-determination, although more work is needed. Studies did not include participants under 12 years old, and the few studies that provided sociodemographic data mainly included White/European American participants. In addition, there was limited focus on participants with ASD and intellectual disability, as approximately five times more participants had ASD without intellectual disability. Future research should focus on self-determination of students with ASD in elementary school, focus on students with a range of ASD-related characteristics and support needs, and ensure that sociodemographic characteristics are represented accurately. In addition, two studies did not use validated measures to assess self-determination outcomes and 81.8% of studies did not assess social validity of the interventions. Thus, future research should prioritize the use of reliable measures and a clear reporting of social validity of the interventions utilized. Furthermore, enhanced rigor of methodological design should be considered and emphasized. Of the reviewed intervention studies, only one study was considered to be methodologically sound according to our review criteria. This is problematic given that the strength of conclusions of a given study relies on the rigorosity of its method. There were several issues that affected the assessment of the quality of included studies. For example, one common domain of need across evaluated studies was providing specific information about the context and setting where the intervention was implemented. Additionally, most of the examined intervention studies did not meet all the criteria for the internal validity (89%) and outcome measures and dependent variables (78%). Thus, there is a need for enhanced rigor of research in future studies. For instance, by means of providing sufficient information regarding the critical features of the context or setting, the psychometrics of outcome measures and the validity of the conclusions drawn and their generalization to specific settings and populations.

Most of studies that addressed stakeholders' perceptions used the proxy version of the AIR scale to assess self-determination (75%), whereas only one study combined proxy-reports and students' self-reports. Both parents and teachers rated students' self-determination as reduced in the studies using proxy assessments. However, when students' perspectives were included, they reported higher levels of self-determination capacity than parents and educators as well as fewer opportunities for self-determination at school than educators. Deficits-based view of ASD, focused on the limitations of the person (Carter et al. 2020), as well as a lack of equipment to promote instruction in self-determination for students with ASD at schools (Wehmeyer

and Shogren 2008) might be part of the explanation for these differences. Given the findings of discrepancies between proxy-reports and students' self-reports (Shogren et al. [in press](#); Tomaszewski et al. [in press](#)), it is critical for future research to reflect the perspectives of students with ASD on their own self-determination and consider how to triangulate self- and proxy-reports (including students with greater language difficulties). This approach would provide complementary information and therefore, a more comprehensive assessment to promote self-determination. Furthermore, several personal and environmental factors were found to influence student self-determination in the included data sources. Most of the studies analyzed personal factors, mainly age, gender, and disability category for participants. Personal factors that are associated with specific needs of ASD, such as social skills and level of communication, were identified as influential on self-determination. However, they were studied less frequently. In addition, an identified area of need for future research are studies examining environmental predictors as there were a limited number of environment factors analyzed. Across studies that examined environmental factors, student directed transition planning instruction, spending hours with peers and more time in general education were identified as predictors of higher self-determination, suggesting the role of opportunities and supports in the environment in shaping self-determination outcomes. Further research should be conducted to enhance understanding about the interactive effect of factors within various ecological systems (e.g., schools, homes) related to self-determination of young people with ASD, paying particular attention to factors related to specific characteristics of people with ASD and factors that are subject to change to enhance services and supports (Wehmeyer et al. 2011a; Wehmeyer and Garner 2003).

Limitations

Several limitations of the present literature review must be acknowledged. First, this review comprises peer-reviewed articles that were published in English through August 2020. Therefore, there might be more studies published in non-peer reviewed sources or written in other languages as well as studies not yet published. Considering other cultural and language backgrounds is required to incorporate global research and practice that focuses on promoting self-determination for students with ASD. Second, even though this review encompasses the full spectrum of ASD, several included studies did not specifically provide specific results or sociodemographic data for this group. Hence, it is crucial that future studies include this information to know which subgroup and conditions of students with ASD results apply and drive future practice. Third, with respect to article inclusion and variable coding, interrater reliability for identifying and coding research sources ranged from 80.9% to 89.4%. Nevertheless, 100% agreement was obtained after discussion. This highlights a need to consider the most effective ways to operationally define the inclusion criteria and support the analysis rigor of research using the QIs.

Implications for Practice

With regard to implications for practice, this review highlights that students with ASD can benefit from self-determination interventions and considering factors that predict self-determination, although ongoing research is needed given the limited number of intervention studies. Among the intervention studies, the SDLMI (Wehmeyer et al. 2000),

WFA (Wehmeyer et al. 2004), and WF (Wehmeyer and Palmer 2011) were the instructional methods more commonly used. These methods encompass different self-determination skills (e.g. decision making, goal setting), can be implemented with children and youth with and without intellectual disability and are supported by a large amount of empirical evidence (e.g., Hagiwara et al. 2017). In addition, characteristics and needs of students with ASD should be considered when developing and implementing interventions. For instance, educators could provide clear definitions and real-world examples, give opportunities to choose with whom they engage in a task, and utilize visual supports when teaching students with ASD self-determination skills (Wehmeyer et al. 2010).

Conclusions

To the best of our knowledge, this study represents the first literature review to systematically examine research studies about overall self-determination outcomes of students with ASD. Interventions, stakeholder perspectives and contextual analysis were the types of articles identified in the research literature. Furthermore, this review suggests that several factors and strategies enhance self-determination outcomes for students with ASD and provides stakeholders with relevant information to promote self-determination in this group. Nevertheless, there is a need for ongoing research that demonstrate rigor in methodology as well as an increased analysis and reporting of personal and environmental factors that shape the self-determination outcomes of students with ASD to guide services and supports.

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Compliance with Ethical Standards

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Affiliations

M^a Lucía Morán¹ · Mayumi Hagiwara² · Sheida K. Raley³ · Abdulaziz H. Alsaeed³ · Karrie A. Shogren³ · Xueqin Qian⁴ · Laura E. Gómez¹ · M^a Ángeles Alcedo¹

✉ M^a Lucía Morán
moranlucia@uniovi.es

¹ University of Oviedo, Oviedo, Asturias, Spain

² San Francisco State University, San Francisco, CA, USA

³ University of Kansas, Lawrence, KS, USA

⁴ Lawrence Free State High School, Lawrence, KS, USA