AUTISM AND SELF-DETERMINATION: MEASUREMENT AND CONTRAST WITH OTHER DISABILITY GROUPS

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ABSTRACT

This dissertation consists of four chapters. Chapter 1 provides an introduction to the self-determination literature documenting the importance of promoting the self-determination of transition and secondary age students with disabilities, as well as a summary of research examining the self-determination of students with disabilities across disability categories, with a particular focus on students with autism spectrum disorders (ASD) and the need for additional research with this latter population. Chapter 2 investigates the factor structures of two instruments measuring the self-determination of students with ASD. Ninety-five middle and high school students (17% female and 83% male) ages 13 through 22 years participated in the investigation of the validity of two instruments, *The Arc's Self-Determination Scale* (SDS) and *AIR Self-Determination Scale* (AIR). A Confirmatory Factor Analysis (CFA) was conducted separately for the SDS and AIR data. The findings of this study indicated that the parameter estimates and the model fit results supported the hypothesized factor structure in this sample, at least for the first three of four factors of the SDS and fully supported the two factors of the AIR. Chapter 3 builds on the findings of Chapter 2 and examines the differences in self-determination among students with ASD, students with intellectual disability (ID), and students with learning disabilities (LD). A total of 222 participants with an equal size group for each of the three disability categories (ASD, ID, LD) were selected to participate in the comparison of total self-determination and domain scores. One-way between-subjects multivariate analysis of variance (MANOVA) was performed on six dependent variables/factors, including autonomy, self-regulation, psychological empowerment, self-realization, capacity, and opportunity. The results indicated that (a) students with ASD and ID and LD were different in their scores in these domains, and (b) students with ASD had lower levels of autonomy when compared to students

with LD. Chapter 4 presents the conclusions and implications of the findings of Chapter 2 and 3. The primary implications for future research indicate that the factors of the two self-determination measures can be used as reliable outcome variables useful for detecting treatment effects of experimental design studies promoting the self-determination of students with ASD. Also, future research is encouraged to investigate the items that loaded negatively onto *Self-Realization* domain of the SDS. In addition to significant group differences in self-determination among three disability groups, future research should examine group differences in each essential characteristic of self-determination or in the component elements of self-determined behavior to provide a more completed profile of relative self-determination for this group. The primary implications for educators were that the two commonly used instruments are applicable to the population of students with ASD. Also, students with ASD, ID, and LD need instruction to promote self-determination, but students with ASD also need instructional emphases on several component elements as shown by the domain-level differences found in this study.

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我真心感謝所有的人！

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CHAPTER 1: INTRODUCTION

Efforts to promote the self-determination of people with disabilities emerged as a result of social, political, and educational factors emerging over the past half century. Influenced by the civil rights movement of the 1960's and the prohibition of discrimination, an emphasis on promoting the self-determination of people with disabilities originated from the disability rights movements empowerment emphasis claiming the right of people with disabilities to make choices about their own lives and take control of decisions affecting their daily lives. An early catalyst to a focus on self-determination, the Normalization Principle, was first articulated in Sweden for people with cognitive disabilities and emphasized that people with disabilities should be treated and have life experiences like those of their peers without disabilities (Nirje, 1972),. Following Nirje's call for self-determination for people with disabilities, the self-advocacy and independent living movements emphasized that people with disabilities deserved civil and human rights protections that provided them equal opportunities and protections in social and economic domains (Ward, 1989). An educational emphasis on the importance of self-determination was initiated by a series of federal actions in the early 1990s. In 1990, the Secondary Education and Transition Service for Youth with Disabilities Program within the Office of Special Education Programs (OSEP) began an initiative that eventually funded 26 projects designed to identify and develop skills to promote self-determination, including the development of curricula and model programs to promote self-determination (Ward, 1996; Ward & Kohler, 1996; Wehmeyer, Bersani, & Gagne, 2000). This federal initiative catalyzed research in the area, resulting ultimately in a literature base documenting positive educational outcomes of efforts to promote self-determination (Algozzine, Browder, Karvonen, Test, & Wood, 2001; Malian & Nevin, 2002). In addition to the federal funding, the importance of promoting self-

determination to the field of special education was reinforced by requirements for student participation in transition planning in the 1990, 1997, and 2004 amendments to the Individuals with Disabilities Education Act (IDEA).

Until more recent years, general and special education research and practice had been dominated by theories of human pathology in which students with disabilities were considered difficult learners with defective characteristics (Skrtic, 1995). Special education systems and services, in particular, were not structured in the context of youth empowerment (Powers et al., 1996; Ward & Kohler, 1996). In addition, people with disabilities were consistently reported to have less successful outcomes in the areas of employment, independent living, and quality of life compared with such outcomes for people without disabilities (Chadsey-Rusch, Rusch, & O'Reilly, 1991; Field, Sarver, & Shaw, 2003). To improve these outcomes, emphasis has been placed on shifting education and supports beyond the medical and social control models of human functioning towards a broader social-ecological perspective, resulting in the application of meaningful social involvement and opportunities to learn and exercise self-determination (Field & Hoffman, 1999; Ward & Meyer, 1999). Subsequently, in the last decade, promoting self-determination has become a critical instructional focus to address the urgent needs that students with disabilities have to develop a sense of empowerment and become a guiding force in their lives and make decisions advocating for themselves (Grigal, Neubert, Moon, & Graham, 2003; Wehmeyer, 1997).

Promoting Self-Determination as an Evidenced-Based Practice

The self-determination literature has offered several definitions and conceptualizations of self-determination (Field & Hoffman, 1994; Martin & Marshall, 1995; Ward, 1988; Wehmeyer, 1996). Wehmeyer (2006) proposed and refined a definition of self-determination within the

theoretical framework of a functional model of self-determination, stating that "self-determined behavior refers to volitional actions that enable one to act as the primary causal agent in one's life and to maintain or improve one's quality of life" (p. 117). Specifically, *volitional actions* are behaviors acting consciously with purposeful intention and a *causal agent* is a person who makes or causes things to happen in his or her life. Self-determined behaviors are actions reflecting four essential characteristics: (a) a self-determined person acts autonomously, (b) a person demonstrates self-regulates behavior, (c) a person responds to events and environment in a psychologically empowered manner, and (d) a person acts in a self-realizing manner with self-awareness and self-knowledge (Wehmeyer, Abery, Mithaug, & Stancliffe, 2003, p.182).

Researchers and policymakers in the field of special education identified the lack of self-determination related skills and opportunities as contributing to the fact that students with disabilities were less successful when graduating from high school (Chadsey-Rusch, Rusch, & O'Reilly, 1991; Field, Sarver, & Shaw, 2003). Therefore, promoting self-determination has become an important part of transition process, as well as best practice in special education services over the past two decades (Halloran, 1993; Wehman, 1993; Wehmeyer, 1997). There is a growing database documenting the empirical link between promoting self-determination and positive educational and adult outcomes, including academic performance, employment, independence, and overall quality of life (Carter, Lane, Pierson, & Glaeser, 2006; Field, Sarver, & Shaw, 2003; Martin et al., 2003; Wehmeyer & Palmer, 2003; Williams-Diehm, Wehmeyer, Palmer, Soukup, & Garner, 2008). Wehmeyer and Schwartz (1997) and Wehmeyer and Palmer (2003) established a relationship between enhanced self-determination and more successful life outcomes after graduating from high school for students with intellectual disability or learning disabilities, including higher employment rates and better wages. Similarly, Wehmeyer and

Schwartz (1998) collected data on quality of life and self-determination from 50 adults with intellectual disability, indicating that higher self-determination status was correlated with more positive quality of life. Wehmeyer and Schalock (2001) concluded that students with cognitive disabilities were likely to have better academic performances and more positive adult outcomes if they were more self-determined. The importance of self-determination is also found in secondary education settings suggesting a positive correlation between levels of self-determination and academic success for 88 students with learning disabilities enrolled at a major university (Sarver, 2000). A comprehensive review of self-determination literature conducted by Algozzine and colleagues (2001) further supported the effectiveness of strategies and interventions to promote self-determination, determining that such efforts resulted in positive educational outcomes.

In more recent studies, researchers were have established a causal relationship between efforts to promote self-determination and enhancement of the self-determination and positive outcomes of transition-age students with disabilities by using group-randomized designs (Palmer, Wehmeyer, Shogren, Williams-Diehm, & Soukup, 2012; Shogren, Palmer, Wehmeyer, Williams-Diehm, & Little, 2012; Wehmeyer, Palmer, Shogren, Williams-Diehm, & Soukup, 2013; Wehmeyer et al., 2012). Wehmeyer and colleagues (2013) conducted a randomized trial placebo control group study of 371 high school students with intellectual disability and learning disabilities, finding that after receiving instructions on multiple instructional components, including a variety of research-based interventions to promote self-determination and student involvement in transition planning, students in the intervention group had significant improvement in self-determination compared to the control group. A similar causal relationship was found by Wehmeyer and colleagues (2012) in a randomized group study with treatment and

control groups including 312 high school students with cognitive disabilities examining the efficacy of implementing the *Self-Determined Learning Model of Instruction* (SDLMI, Wehmeyer, Palmer, Agran, Mithaug, & Martin, 2000). The results indicated that the group receiving instructions on the SDLMI demonstrated significant increases in self-determination as a result of the intervention. Shogren and colleagues (2012) further supported the efficacy of SDLMI on outcomes related to student academic and transition goal attainment as well as access to the general education curriculum. In a study evaluating the *Beyond High School Model* (Wehmeyer, Garner, Lawrence, Yeager, & Davis, 2006) promoting student involvement in educational planning for 109 high school students with intellectual disability, Palmer and colleagues (2012) found students' enhanced self-determination after implementing the *Beyond High School Model*. A causal link was also established on an intervention of the *Whose Future Is It Anyway?* (Wehmeyer et al., 2004) showing significant increases in self-determination after receiving instructions on transition knowledge and skills (Wehmeyer, Palmer, Lee, Williams-Diehm, & Shogren, 2011).

Self-Determination and Students with Disabilities

It is evident that students with disabilities have limited knowledge, skills, and fewer opportunities to develop and enhance their self-determination not only in the transition process but also throughout their educational experiences (Pierson, Carter, Lane, & Glaeser, 2008; Martin et al., 2006; Trainor, 2005; Zhang, 2001). Students with disabilities have been reported by educators to have limited knowledge about self-determination (Carter, Lane, Pierson, & Glaeser, 2006), engage less frequently in self-determined behaviors (Trainor, 2005), have difficulty advocating for themselves (Wanger et al., 2003; Whitney-Thomas & Moloney, 2001), and have few opportunities to learn and practice skills contributing to self-determination (Grigal,

Neubert, Moon, & Graham, 2003). The same finding of limited self-determination has also been indicated in postsecondary education, where more critical thinking and higher levels of independent learning are expected (Brinckerhoff, McGuire, & Shaw, 2002). Several characteristics of environments supporting self-determination were suggested as a result of interviews with college students with learning disabilities, including self-determined role models, self-determination skill instruction, opportunities for choice, positive communication, availability of supports, and social support systems (Field, Sarver, & Shaw, 2003; Sarver, 2005).

In addition to research on the self-determination status of students with disabilities, the literature also documents the field's knowledge about the component elements of self-determined behavior (Algozzine, Browder, Karvonen, Test, & Wood, 2001; Pierson, Carter, Lane, & Glaeser, 2008; Wehmeyer, Shogren, Zager, Smith, & Simpson, 2010). The component elements of self-determined behavior involve the development and acquisition of multiple/ interrelated skills and attitudes, leading to the four essential characteristics of self-determined behavior articulated previously (Wehmeyer, 2006). These component elements include choice making, decision making, problem solving, goal setting and attainment, self-regulation/self-management, self-advocacy and leadership, internal locus of control, positive attributions of efficacy and outcome expectancy, self-awareness, and self-knowledge (Wehmeyer & Field, 2007, p.6). Algozzine and colleagues (2001) pointed out limitations in the current knowledge-base pertaining to these component elements: first, relatively little is known about component elements other than choice-making, goal setting/attainment, self regulation, or problem solving skills; and, second, the literature base lacks diversity across disability groups pertaining to knowledge about self-determination related skills. Wehmeyer and Kelchner (1995) collected self-report data from 408 adolescents and adults with intellectual disability to measure their autonomous functioning in the

four behavioral domains (self-/family-care activities, management activities, recreational/leisure activities, and social/vocational activities), finding that participants with intellectual disability had limited autonomy. In terms of problem solving, research studies have consistently shown that people with intellectual disability have difficulty with independent problem-solving, as well as exhibit a relatively inflexible pattern of problem-solving (Agran, Salzberg, & Stowitschek, 1987; Ferretti, 1989; Wehmeyer & Kelchner, 1994). That is, individuals with intellectual disability were likely to repeat strategies used in the past without adjusting their strategies to fit a current situation, and they tended to generate a limited number of possible solutions or more irrelevant. Moreover, with regard to the internal/positive perception of control that is positively correlated with successful adult outcomes and overall quality of life, people with disabilities generally tended to have more external perceptions of control than their peers without disabilities (Wehmeyer & Schalock, 2001). People with disabilities do not feel empowered to control their important life situations to achieve desired outcomes; instead, often, other people act on their behalf in situations of decision/choice making, problem solving, and goal settings (Carnahan, Hume, Clarke, & Borders, 2009; Wehmeyer & Schalock, 2001). Comparing different types of disability, Wehmeyer (1994) suggested that adolescents and adults with intellectual disability had less adaptive attributions of efficacy/expectancy than did their peers without disabilities or with learning disabilities.

Self-Determination and Students with Autism

Autism spectrum disorders (ASD) are pervasive developmental disorders defined by a triad of characteristics: substantial challenges in social interactions; difficulties in verbal and nonverbal communication; and the presence of narrow repetitive and stereotyped patterns of behavior, interests, and activities (DSM-IV-Text Revision; American Psychiatric Association

[APA], 2000). The unique characteristics of students with ASD affect their socialization and verbal and nonverbal communication, and may lead to specific areas of instructional and support need as it pertains to promoting self-determination (Field & Hoffman, 1999; Fullerton & Coyne, 1999). Even though promoting self-determination has become an important component in transition and secondary education (Pierson, Carter, Lane, & Glaeser, 2008; Wehmeyer, Shogren, Zager, Smith, & Simpson, 2010), only a limited amount research has been conducted investigating the impact of disability category on students' level of self-determination, with the exception of research in the category of intellectual disability (Shogren et al., 2007). Further, far fewer efforts have been undertaken to examine the self-determination of students with ASD. To illustrate, in a comprehensive meta-analysis of the effectiveness of strategies and interventions to promote self-determination (Algozzine, Browder, Karvonen, Test, & Wood, 2001), only 10% of students studied were students with ASD; the most frequently studied disability categories were students with intellectual disability (69% of the studies in group studies; 72% of the studies in single-subject studies) or students with learning disabilities (46% of the studies in group studies; 48% of the studies in single-subject studies). A similar disproportionate representation of students with ASD was also found in another literature review investigating interventions to increase student involvement in IEP meetings where only one participant with autism was represented out of a total of 309 students in 16 studies, while students with ID and LD represented more than 80% of participants (Test et al., 2004). Evidently, there is a need to understand and enhance the self-determination of students with autism.

To date, among the few empirical studies regarding self-determination and students with autism, several instructional and environmental factors have been suggested to improve the development of concepts and skills related to self-determination in students with autism (Clark,

Olympia, Jensen, Heathfield, & Jenson, 2004; Field & Hoffman, 1999; Fullerton & Coyne, 1999). For instance, Fullerton and Coyne (1999) suggested that enhanced self-determination could be promoted by targeting the areas of self-knowledge related to autism, communication, life planning, and self-directed goal setting and actions. Also, it seems clear that family involvement plays an important role in the development of self-determination in adolescents with autism through parents' modeling self-determination related beliefs, knowledge, and skills (Field & Hoffman, 1999). In addition to the influence of educators and parents, the role of school psychologists in supporting the development of autonomy and overall self-determination for students with intellectual and developmental disabilities has been suggested (Clark, Olympia, Jensen, Heathfield, & Jenson, 2004). More recently, a social ecological approach was proposed to promote the self-determination of students with ASD (Wehmeyer, Shogren, Zager, Smith, & Simpson, 2010). This interdisciplinary model conceptualizes environmental and personal variables guiding the design and evaluation of interventions to promote the self-determination of students with ASD with the emphasis on both the enhancement of personal social capacity as well as the modification of social/environmental contexts in efforts to promote self-determination. This contemporary approach to promote self-determination aligns with the empirical and instructional focus on social inclusion and social support in the autism literature.

Areas in Need of Future Research

There is a growing literature base pertaining to personal and environmental factors related to self-determination (Lee et al., 2010; Shogren et al., 2007; Stancliffe, Abery, & Smith, 2000; Wehmeyer & Garner, 2003). In particular, there is knowledge about contextual factors/environmental characteristics contributing to students' levels of self-determination, suggesting that higher levels of self-determination are positively correlated with more inclusive

educational placement and active involvement in educational and transition planning (Test et al., 2004; Williams-Diehm, Wehmeyer, Palmer, Soukup, & Garner, 2008), better social skills and social understanding (Nota, Ferrari, Soresi, & Wehmeyer, 2007; Pierson, Carter, Lane, & Glaeser, 2008), and instructional supports in visual organization and social information (Fullerton & Coyne, 1999). Further research is needed, however, to learn more about the possible differences in self-determination by disability category. Even though disability category, viewed as one of the personal factors, would not be amenable to interventions, understanding the potential influence of particular disability experiences has a relevance to program design and evaluation (Pierson, Carter, Lane, & Glaeser, 2008). Understanding different profiles of self-determined behavior could also inform practitioners whether students across disability categories have similar instructional needs in the area of self-determination so that effective strategies, supports, and measurements can be developed to support the efforts to promote the self-determination of students with disabilities, including the under-researched population of students with autism.

Purpose of the Study

In light of the limited information about the self-determination of students with ASD, the goal of this dissertation was to examine the self-determination of students with ASD by, first, validating two self-determination measures with a sample of transition-aged students with ASD to see if the measures were applicable in students with autism; and, second, to compare the levels of self-determination among students who are identified with autism, intellectual disability, and learning disabilities.

Three research questions will be examined and discussed in the following chapters.

1. Do four dimensions underly the 72 items of *The Arc's Self-Determination Scale* (SDS; Wehmeyer & Kelchner, 1995) in a sample of students with ASD by

performing a Confirmatory Factor Analysis (CFA)? Do those items cluster meaningfully into four essential characteristics of self-determined behavior, as consistent with the structure of the SDS?

2. Do two dimensions underly the 24 items of the *AIR Self-Determination Scale – Student* (AIR; Wolman, Campeau, Dubois, Mithaug & Stolarski, 1994) in a sample of students with ASD by performing a Confirmatory Factor Analysis (CFA)? Do those items cluster meaningfully into two interpretable factors, as consistent with the structure of the AIR?
3. Are there any differences across three disability groups (autism, intellectual disability, and learning disabilities) on students' self-reported levels of self-determination as measured by *The Arc's Self-Determination Scale* (SDS; Wehmeyer & Kelchner, 1995) and the *AIR Self-Determination Scale – Student* (AIR; Wolman, Campeau, Dubois, Mithaug & Stolarski, 1994) by performing a Multivariate Analysis of Variance (MANOVA)?

CHAPTER 2: AUTISM AND SELF-DETERMINATION: FACTOR ANALYSIS OF TWO MEASURES OF SELF-DETERMINATION

Efforts to promote the self-determination of students with disabilities have been facilitated over the past few decades by the development of theoretical models (Abery, & Stancliffe, 1996; Wehmeyer, Abery, Mithaug, & Stancliffe, 2003); instructional methods, materials, and strategies (Test, Karvonen, Wood, Browder, & Algozzine, 2000; Wehmeyer, Palmer, Agran, Mithaug, & Martin, 2000); empirical validation of positive student and adult outcomes related to self-determination (Shogren, Lopez, Wehmeyer, Little, & Pressgrove, 2006; Cobb, Lehmann, Newman-Gonchar, & Alwell, 2009); and acquisition of knowledge pertaining to personal and environmental factors related to self-determination (Lee, Wehmeyer, Palmer et al., 2010; Shogren et al., 2007; Stancliffe, Abery, & Smith, 2000; Wehmeyer & Garner, 2003). Research on self-determination has been conducted with students across disability categories (Field, 1996). To date, however, only a limited amount of research has been conducted investigating the impact of type of disability (or disability category) on students' level of self-determination, with the exception of research in the category of intellectual disability (Shogren et al., 2007). Consequently, few efforts have been undertaken to examine the self-determination of students with autism spectrum disorders (ASD). The unique characteristics of students with ASD affect their socialization, verbal and nonverbal communication, and may lead to specific areas of instructional and support need as it pertains to promoting self-determination (Field & Hoffman, 1999; Fullerton & Coyne, 1999). Further, the autonomy and self-determination of people with ASD may be impeded by the frequent application of applied behavior analysis techniques, highly contingent environments, and exclusively teacher-directed activities (Clark, Olympia, Jensen, Heathfield, & Jenson, 2004). The impact of these personal and environmental

factors may result in missed opportunities to practice self-regulation, decision-making, and other skills and actions leading to enhanced self-determination. With the emergence of the self-advocacy movement for people with ASD, led by people with autism and Asperger syndrome and their families, and the availability of advanced interactive communication technology, greater self-awareness and more positive social and cultural values have emerged within the autism community. These values have shifted education and supports beyond the medical and social control model of human functioning towards a broader ecological perspective, resulting in the emphasis on meaningful social involvement and opportunities to learn and exercise self-determination (Field & Hoffman, 1999; Ward & Meyer, 1999). As such, promoting self-determination has become an increasingly important element in the education of students with ASD, although more knowledge is needed to better understand the factors that improve the self-determination of all people with disabilities, but particularly, perhaps, people with ASD.

Self-Determination and Students with Autism

Few studies have focused on the specific needs of students with ASD related to the construct of self-determination. Algozzine, Browder, Karvonen, Test, and Wood (2001) conducted meta-analytic studies of the effectiveness of interventions promoting component elements of self-determined behavior (e.g., problem solving, choice making, decision making, goal setting , etc.), noting that less than 10% of the students studied were students with ASD. Students with intellectual disability (69% of the studies in group studies; 72% of the studies in single-subject studies) and learning disabilities (46% of the studies in group studies; 48% of the studies in single-subject studies) represented the most frequently studied disability categories among the total studies reviewed. Students with autism were not present proportionate to their prevalence in the group or single-subject design meta-analyses conducted by Algozzine and

colleagues. Similarly, in another literature review investigating interventions to increase student involvement in IEP meetings, only one participant with autism was represented out of a total of 309 students in 16 studies, while students with ID and LD represented more than 80% of participants (Test et al., 2004). As such, there is a need for research to understand, document, and support the promotion of the self-determination of students with ASD.

Conventionally, social skills training and social inclusion have been the main focus of research investigations and intervention designed for students with ASD (Bellini, Peters, Benner, & Hopf, 2007; Krasny, Williams, Provencal, & Ozonoff, 2003; McConnell, 2002). There is a linkage, though it is not yet well studied, between promoting self-determination and social effectiveness (Wehmeyer & Smith, 2011). Pierson, Carter, Lane, and Glaeser (2008) identified social skills as an important component in promoting self-determination, especially in the context of goal planning in school environments, and suggested the combination of instructional efforts to promote self-determination and social skills. Integrating self-determination related concepts and strategies into the instructional context has been viewed as an effective way to improve social competence and inclusion of students with disabilities who need only limited or intermittent levels of support, including many students with ASD (Meadan & Monda-Amaya, 2008). Fullerton and Coyne (1999) implemented an instructional program to promote the self-determination of 23 adolescents and young adults with autism, targeting the areas of self-knowledge related to autism, communication, life planning, and self-directed goal setting and actions. Results from this study indicated that the self-determination related concepts and strategies had a positive impact on the sensory, cognitive and social experiences of young people with ASD, as well as improving their ability to cope with these experiences in the environments around them.

Further, the literature suggests that family involvement plays an important role in the development of self-determination in adolescents with autism, due to parents' modeling self-determination related beliefs, knowledge, and skills (Field & Hoffman, 1999). Clark and colleagues (2004) specifically pointed out the role of school psychologists in supporting the development of autonomy and self-determination for students with intellectual and developmental disabilities, including students with autism, in terms of assessment practices, applications of positive behavior support, implementation of instruction to promote self-determination, and systems of educational reform and systems change. The literature also suggests that a social ecological approach to promote self-determination is especially critical for students with ASD (Wehmeyer, Shogren, Zager, Smith, & Simpson, 2010). This integrated and transdisciplinary perspective proposes a model that conceptualizes the environmental and personal variables guiding the design and evaluation of interventions to promote the self-determination of students with ASD, particularly emphasizing social effectiveness, social capital, and social inclusion as mediating variables. In other words, this framework promotes research and practices that address areas of both the enhancement of personal social capacity as well as the modification of social/environmental contexts in efforts to promote self-determination. Due to the unique communication and social relationship needs of students with ASD, interventions addressing reciprocal personal and environmental interactions have particular relevance for educating students with ASD.

Factors Contributing to Self-Determination

In terms of the literature on predictors contributing to the self-determination of students with disabilities, research has been conducted examining the impact of personal characteristics and environmental conditions. For personal characteristic factors, even though research suggests

a positive correlation between level of intelligence and self-determination (Nota, Ferrari, Soresi, & Wehmeyer, 2007; Stancliffe, Abery, & Smith, 2000; Wehmeyer, 1996), Wehmeyer and Garner (2003) and Lee, Wehmeyer, Palmer et al. (2010) found that level of intelligence was not a significant predictor of high and low levels of self-determination. Also, mixed results have been found related to self-determination differences by gender. Some studies have found gender differences on self-determination, suggesting that females had higher self-determination scores than males (Lee, Wehmeyer, Palmer et al., 2010; Nota et al., 2007; Shogren et al., 2007), while other studies did not (Wehmeyer, 1996; Wehmeyer & Garner, 2003). These gender-related differences in self-determination scores are probably simply reflective of gender role differences across societies.

Other personal factors that could impede students' self-determination include low self-esteem, external locus of control, and lack of goal-setting skills (Field et al., 1998). Nota and colleagues (2007) examined the relationships between self-determination and personal characteristics, social abilities, and environmental living situations of 141 people with ID in Italy. Results showed that self-determination was associated with IQ, basic social skills, and quality of life scores. They also concluded that participants attending day centers demonstrated greater autonomy of choice and self-determination comparing to people living in institutions. For environmental factors, Lee, Wehmeyer, Palmer et al. (2010) found that instructional (student-directed transition planning instruction), knowledge (pre-intervention transition planning knowledge), and dispositional (self-efficacy) factors predicted level of self-determination as opposed to personal characteristics (age, gender, IQ). Shogren and colleagues (2007) examined the predictive relationships between students' level of self-determination and multiple individual and ecological factors in students with learning disabilities and intellectual disability, revealing

that capacity, opportunity, and transition empowerment predicted level of self-determination. Also, the result of an analysis of the ecological factors related to self-determination revealed that teachers' perception of students' capacity for self-determination varies based on students' level of cognitive impairment as opposed to opportunities for self-determination (Shogren et al., 2007). For self-determination related to postsecondary educational outcomes, Sarvor (2000) suggested a positive correlation between level of self-determination and academic success for 88 students with learning disabilities enrolling in a major university. In addition, the results of in-depth interviews with four students with learning disabilities revealed the strong influence of environmental factors (institutional infrastructure, information access, availability of social support system, accessibility of faculty) and personality factors (autonomy, problem-solving, persistence) in the support for self-determination in postsecondary settings.

In summary, then, an examination of the existing literature pertaining to self-determination reflects a general consensus that promoting self-determination is an element of high quality special education services (Carter et al., 2006; Wehmeyer, Gragoudas, & Shogren, 2006). Research has supported the relationship between self-determination and positive educational and personal outcomes (Pierson, Carter, Lane, & Glaeser, 2008; Wehmeyer & Palmer, 2003). Students with ASD, as well students with and without disabilities, can benefit from instruction and interventions promoting the development of self-determination-related skills and knowledge. The knowledge base regarding the self-determination of students with ASD, however, remains limited. Particularly given the fact that students with ASD experience difficulties in communication and relationship skills related to the development of self-determination (Wehmeyer, Shogren, Zager, Smith, & Simpson, 2010), it is important to investigate the factors that promote the self-determination of people with autism.

Purpose of Study

The need for research examining the self-determination of students with ASD has been established. The results of this study would extend the self-determination literature with respect to the utility and validity of two self-determination measures for students with ASD. Accordingly, the purpose of this study was to examine the psychometric properties of two self-determination measures, *The Arc's Self-Determination Scale* (SDS) and the *AIR Self-Determination Scale* (AIR), with a sample of students with ASD by examining whether the items would cluster meaningfully into the subscales of the two surveys using a Confirmatory Factor Analysis (CFA). The goal was to evaluate if the identified factor structures correspond to the psychometric properties of the SDS and AIR.

The analyses in this study addressed two main questions. These two research questions were:

1. Are there four dimensions underlying the 72 items of *The Arc's Self-Determination Scale* (SDS) in a sample of students with ASD? Do those items cluster meaningfully into four essential characteristics of self-determined behavior, as consistent with the structure of the SDS?
2. Are there two dimensions underlying the 24 items of the *AIR Self-Determination Scale-Student* (AIR-S) in a sample of students with ASD? Do those items cluster meaningfully into two interpretable factors, as consistent with the structure of the AIR?

Method

A Confirmatory Factor Analysis (CFA) was performed to examine the validity of *The Arc's Self-Determination Scale* (SDS) and the *AIR Self-Determination Scale* (AIR) with a sample of students with autism, investigating whether the clusters of survey items are predictor variables

of self-determination in students with ASD.

Sample

Ninety-five middle school and high school students with ASD (*M*= 16.62; *SD*= 2.09) were recruited from school districts in the Midwestern United States. Participating students were those receiving special education services under the IDEA disability category of Autism. Table 1 lists demographic information, including age, gender, race/ethnicity, and approximate level of intelligence of the sample. Students who met inclusion criteria for this study were students who: (a) ranged in age from 13 to 21 years during the 2010-2011 school year; (b) received special education services under the category of Autism (including students with Asperger syndrome and other autism spectrum disorders); (c) were able to communicate preferences and interests (might use augmentative communication or other communicative devices); and (d) were able to respond to open-ended questions such as "What goals are you are working on?" or "What do you like to do in your free time?"

Procedures

Following approval from the Human Subjects Committee at the University of Kansas, participating students were recruited by contacting district personnel to obtain permission to conduct the study. After districts agreed to participate, study participants were recruited through special education teachers who also agreed to participate in the study. Guidelines for nominating participating students were provided to teachers prior to selection. All the students in this study have provided informed consent from parents or guardians. Participants' consent and an approval letter from the human subject committee was obtained for this investigation. Two measures of self-determination were collected from participating students. After being trained in

the appropriate administration protocol, teachers and research investigators administered the two measures of self-determination to participating students.

Measuring Self-Determination

The Arc's Self-Determination Scale. *The Arc's Self-Determination Scale* (SDS; Wehmeyer & Kelchner, 1995b) is a 72-item student self-report measure, assessing global self-determination through the measurement of four essential characteristics of self-determined behavior (Wehmeyer, Kelchner, & Richards, 1996). The first section measures autonomy, including a person's levels of independence and ability to act based on personal beliefs, values, interests, and capacities. Section two of the SDS measures self-regulation, including means-end problem solving and goal-setting and task performance. The third section measures psychological empowerment, reflecting a person's perceptions of control, efficacy, and outcome expectations. The fourth section of the SDS measures self-realization, including self-awareness and self-knowledge. Subscale scores for each of the four domains can be calculated as well as a total self-determination score. A maximum total score of 148 points is possible in this scale with higher scores indicating elevated levels of self-determination. The SDS was normed with 500 adolescents with cognitive disabilities (Wehmeyer, 1996). It was proven to have adequate reliability and validity in measuring self-determination of adolescents with cognitive disabilities (Cronbach's alpha= .90). The SDS has been used to validate the positive associations between promoting self-determination and positive outcomes (Williams-Diehm, Wehmeyer, Palmer, Soukup, & Garner, 2008; Wehmeyer & Palmer, 2003) as well as to provide evidence of successful results in intervention studies (Lee, Wehmeyer, Palmer, Soukup, & Little, 2008; Wehmeyer, Palmer, Agran, Mithaug, & Martin, 2000).

The AIR Self-Determination Scale. The *AIR Self-Determination Scale* (AIR; Wolman,

Campeau, Dubois, Mithaug, & Stolarski, 1994) measures a person's capacities and opportunities pertaining to self-determination, and is available in Student, Educator, and Parent versions. For the purpose of this analysis, the Student (AIR-S) version was selected to measure students' self-determination. The AIR-S has 24 questions, providing data on students' capacity and opportunity for self-determination. The capacity subscale contains questions about things students do related to self-determination ("Things I Do" subscale) and how students feel about performing these-self-determination behaviors ("How I Feel" subscale). The opportunity subscale contains questions about students' perceptions of their opportunities to perform self-determined behaviors at home and at school. Scores are rated on a scale from 1 (Never) to 5 (Always). Capacity and opportunity subscale scores can be calculated as well as a total self-determination score of summing the two subscales. The AIR scale was developed and normed with 450 students with and without disabilities and their teachers (Wolman et al., 1994). It was proven to have adequate reliability and validity in measuring students' capacity and opportunity for self-determination.

Confirmatory Factor Analysis

Factor analysis is a statistical method used to identify latent variables (factors) that explain relationships among observed variables (e.g., participants' responses on a survey). This technique is based on partitioning the variance of each observed variable into two parts, common factor variance and unique factor variance. Whereas explanatory factor analysis (EFA) is used to identify a set of interpretable common factors, the goal of confirmatory factor analysis (CFA) is often to test a hypothesized factor structure (model) that describes the relationships of the observed variables (indicators) with the factors as well as the associations among the common or unique factors. Therefore, CFA allows researchers to examine measurement and structural properties of a survey or scale.

A CFA model can be written as:

$$Y_i = \mu + \Lambda\eta_i + \varepsilon_i,$$

where Y_i is a *p*-dimensional vector of observed variables for individual *i*, μ is a *p*-dimensional vector of observed means, Λ is a $p \times m$ factor loading matrix, where *m* indicates the number of common factors, η_i is an *m*-dimensional vector of factor scores for individual *i*, and ε_i is a *p*-dimensional vector of unique factors. In this model, μ and Λ are constant across individuals, $\eta_i \sim N(0, \Psi)$, and $\varepsilon_i \sim N(0, \Theta)$, where 0 is an *m*-dimensional zero vector, Ψ is an $m \times m$ matrix of common factor covariances, and Θ is a $p \times p$ matrix of unique factor covariances.

A hypothesized CFA model is evaluated based on (a) how well the observed variables load onto a corresponding factor(s) and (b) how well the model fits the data. To evaluate the CFA models for *The Arc's Self-Determination Scale* (SDS) and the *AIR Self-Determination Scale* (AIR), the present study examined incremental as well as absolute fit indices: comparative fit index (CFI; Bentler, 1990), Tucker-Lewis index (TLI; Tucker & Lewis, 1973), root mean square error of approximation (RMSEA; Steiger & Lind, 1980), and weighted root mean square residual (WRMR; Muthén & Muthén, 1998–2010). The CFI and TLI assess how well a hypothesized model fits the data compared with a baseline model, the null model of uncorrelated variables. CFI and TLI values greater than .90 are generally recommended for selecting a suitable model (> .95 = close fit) (Hu & Bentler, 1999). The RMSEA and WRMR measure the difference between observed covariance and predicted covariance of the data. Conventionally RMSEA values less than .08 indicate an acceptable model fit (< .05 = close fit, < .08 = fair fit, < .10 = mediocre fit) (Hu & Bentler, 1999; MacCallum, Browne, & Sugawara, 1996). The WRMR was chosen specifically because it is suitable for the case when the observed variables have a non-normal distribution and/or they are measured in different scales (e.g., binary items and ordinal

items of SDS). WRMR values less than 1.00 indicate an acceptable model fit (Muthén & Muthén, 1998-2010).

Data Analysis

Both self-determination scales, SDS and AIR, were administered to the 95 participating students. Means and standard deviations of the (sub)scale scores were computed for descriptive purposes, demonstrating group-level performance on self-determined behaviors. To address the two research questions, CFA was conducted separately for the SDS and AIR data from students with ASD. More specifically, the SDS and AIR's factor structures were confirmed by examining the alignment with the two theoretical assumptions, respectively: (a) global self-determination is comprised of four essential characteristics of self-determined behaviors in the SDS and (b) the AIR measures students' capacity and opportunity for self-determination. To do so, M*plus* 6.11 (Muthén & Muthén, 1998-2010) was used to fit the hypothesized CFA models. Because the items of the SDS and AIR are categorical (i.e., binary or ordinal), the model parameters (μ, Λ, Ψ, Θ in Equation 1) were estimated via the use of a robust weighted least squares estimator (WLSMV). In the current data, 0.1% and 9.8% of responses were missing for the SDS and AIR, respectively. WLSMV method could handle the incomplete data by using full information maximum likelihood (FIML) estimates as the first stage estimate for the variances/covariances of the data (Muthén & Muthén, 1998-2010). To set the scale for the common factors, the fixed-factor scaling method was used (Brown, 2006). Specifically, variances of the common factors were fixed to 1, while the factor loadings for all items were freely estimated.

Results

CFA models were estimated to confirm the hypothesized factor structures of the SDS and AIR. The four-factor model of the SDS included the common factors of *autonomy*, *self-*

regulation, *psychological empowerment*, and *self-realization* and their 72 items (32, 9, 16, and 15 items, respectively). All the standardized factor loadings were significant at .05 alpha level (see Table 2), except for three items that load onto *psychological empowerment* (p = .28 – .89) and four items that load onto *self-realization* (p = .07 – .97). Of those four items, three items had a negative loading suggesting that they are not good indicators of *self-realization* among students with autism (ASD). Consequently, *self-regulation* yielded higher standardized factor loadings and thus greater predictability[1] (median = .69, range = .39 – .79), followed by *psychological empowerment* (median = .59, range = .02 – .81), *autonomy* (median = .57, range = .24 – .79), and *self-realization* (median = .39, range = -.32 – .85). In addition, all the factor correlations were positive as anticipated, and they were significant at .05 alpha level except the correlation between *self-regulation* and *self-realization* (p = .05) (see Table 3). The RMSEA of .03 and the upper limit of the 90% confidence intervals (CI) less than .05 (90% CI = .02 – .04) suggested close fit of this model. However, model fit was less than acceptable according to WRMR (1.05), CFI (.86), and TLI (.86). When *self-realization* (and their 15 items) was dropped from the model, CFI and TLI improved up to .89 which is very close to the minimum acceptable values of .90. Taken together, the parameter estimates (i.e., standardized factor loadings and factor correlations) and the model fit results supported the hypothesized factor structure, at least for the first three factors of the SDS, among students with ASD.

The CFA model of the AIR hypothesized the two common factors of *capacity* and *opportunity*, with 12 items per each factor. All the standardized factor loadings were greater

[1] A standardized factor loading is simply a standardized regression coefficient that quantifies the amount of standard deviation change in an observed variable (indicator or item) given a one standard deviation change in the underlying latent variable (factor). Larger loadings imply greater predictability and thus the meaning of the factor is defined to a greater extent.

than .60 and significant at .05 alpha level (see Table 4). *Capacity* produced somewhat higher standardized factor loadings (median = .80, range = .67 – .88) and thus greater predictability than did *opportunity* (median = .78, range = .62 – .83). The factor correlation was considerably large and positive as expected and it was significant at .05 alpha level (see Table 5). Model fit ranged from acceptable to close fit (RMSEA of .09 [90% CI = .07 – .10], CFI of .94, TLI of .94) except for the WRMR (1.12). Thus, the model results provided supports for the hypothesized factor structure of the AIR among students with ASD.

Table 1

Demographic Information of Participating Students

Demographic Variables	*N / M*	*% / SD*
Gender		
Female	16	16.8%
Male	79	83.2%
Age		
Female	14 / 20.57	16.8% / 3.48
Male	75 / 21.53	83.2% / 3.85
Missing	6	6.3%
Race/ethnicity		
White	72	75.8%
Hispanic/Latino	11	11.6%
African American	6	6.3%
Asian/Pacific Islander	3	3.2%
Native American	1	1.1%
Other	2	2.1%
Approximate level of intelligence		
IQ within normal limits (70 and above)	60	63.2%
Mild mental retardation (IQ 60-69)	19	20.0%
Moderate mental retardation (IQ 45-60)	8	8.4%
Severe/Profound (IQ 44 and below)	-	-
Missing	8	8.4%

Table 2

Standardized Factor Loadings of The Arc's Self-Determination Scale

Factor	Item	Loading	*SE*	*p*
Autonomy	SDS 1	.48	.08	< .01
	SDS 2	.42	.09	< .01
	SDS 3	.49	.08	< .01
	SDS 4	.52	.09	< .01
	SDS 5	.60	.08	< .01
	SDS 6	.63	.07	< .01
	SDS 7	.61	.07	< .01
	SDS 8	.24	.12	.04
	SDS 9	.62	.08	< .01
	SDS 10	.36	.10	< .01
	SDS 11	.40	.09	< .01
	SDS 12	.56	.07	< .01
	SDS 13	.70	.06	< .01
	SDS 14	.64	.07	< .01
	SDS 15	.64	.07	< .01
	SDS 16	.57	.09	< .01
	SDS 17	.79	.05	< .01
	SDS 18	.56	.08	< .01
	SDS 19	.46	.08	< .01
	SDS 20	.37	.09	< .01
	SDS 21	.33	.10	< .01
	SDS 22	.72	.06	< .01
	SDS 23	.64	.07	< .01
	SDS 24	.69	.07	< .01
	SDS 25	.55	.08	< .01
	SDS 26	.27	.10	< .01
	SDS 27	.77	.06	< .01
	SDS 28	.58	.08	< .01
	SDS 29	.58	.08	< .01
	SDS 30	.70	.06	< .01
	SDS 31	.53	.08	< .01
	SDS 32	.55	.08	< .01
Self-regulation	SDS 33	.69	.08	< .01
	SDS 34	.73	.07	< .01
	SDS 35	.75	.07	< .01
	SDS 36	.67	.09	< .01
	SDS 37	.79	.08	< .01
	SDS 38	.73	.09	< .01
	SDS 39	.58	.10	< .01
	SDS 40	.65	.10	< .01
	SDS 41	.39	.12	< .01

Table 2

Standardized Factor Loadings of The Arc's Self-Determination Scale (continue)

Factor	Item	Loading	*SE*	*p*
Psychological empowerment	SDS 42	.02	.15	.89
	SDS 43	.45	.13	< .01
	SDS 44	.12	.15	.41
	SDS 45	.16	.15	.28
	SDS 46	.41	.14	< .01
	SDS 47	.81	.08	< .01
	SDS 48	.44	.11	< .01
	SDS 49	.59	.12	< .01
	SDS 50	.78	.07	< .01
	SDS 51	.67	.11	< .01
	SDS 52	.64	.09	< .01
	SDS 53	.80	.09	< .01
	SDS 54	.58	.12	< .01
	SDS 55	.60	.11	< .01
	SDS 56	.66	.10	< .01
	SDS 57	.54	.13	< .01
Self-realization	SDS 58	.39	.15	< .01
	SDS 59	-.08	.17	.64
	SDS 60	.28	.15	.07
	SDS 61	.41	.17	.02
	SDS 62	-.32	.16	.04
	SDS 63	.17	.23	.46
	SDS 64	.69	.14	< .01
	SDS 65	.70	.12	< .01
	SDS 66	-.01	.17	.97
	SDS 67	.36	.16	.02
	SDS 68	.73	.13	< .01
	SDS 69	.38	.16	.02
	SDS 70	.49	.15	< .01
	SDS 71	.56	.16	< .01
	SDS 72	.85	.10	< .01

Table 3

Correlations between Four Subscales of The Arc's Self-Determination Scale

Factor	1	2	3	4
1. Autonomy	1.00			
2. Self-regulation	.40**	1.00		
3. Psychological empowerment	.60**	.63**	1.00	
4. Self-realization	.50**	.28	.84**	1.00

Note. *r* scores are presented. **$p < .01$.

Table 4.

Standardized Factor Loadings of AIR Self-Determination Scale

Factor	Item	Loading	*SE*	*p*
Capacity	AIR 1	.74	.05	< .01
	AIR 2	.79	.04	< .01
	AIR 3	.80	.04	< .01
	AIR 4	.88	.03	< .01
	AIR 5	.81	.04	< .01
	AIR 6	.73	.05	< .01
	AIR 7	.73	.06	< .01
	AIR 8	.88	.03	< .01
	AIR 9	.82	.04	< .01
	AIR 10	.67	.06	< .01
	AIR 11	.87	.03	< .01
	AIR 12	.80	.04	< .01
Opportunity	AIR 13	.62	.06	< .01
	AIR 14	.66	.06	< .01
	AIR 15	.76	.06	< .01
	AIR 16	.81	.04	< .01
	AIR 17	.76	.05	< .01
	AIR 18	.78	.05	< .01
	AIR 19	.65	.08	< .01
	AIR 20	.80	.06	< .01
	AIR 21	.83	.07	< .01
	AIR 22	.83	.06	< .01
	AIR 23	.82	.06	< .01
	AIR 24	.77	.06	< .01

Table 5

Correlations between Two Subscales of the AIR Self-Determination Scale

Factor	1	2
1. Opportunity	1.00	
2. Capacity	.69**	1.00

Note. *r* scores are presented. **$p < .01$.

Discussion

The central purpose of this study was to confirm the factor structures of two commonly used measures of self-determination, *The Arc's Self-Determination Scale* (SDS) and *AIR Self-Determination Scale* (AIR), in a sample of students with ASD. So far research on self-determination has not yet verified the measurement properties of these two surveys specifically in students with autism. In general, the findings of this study support the measurement properties and the hypothesized factor structures. The findings are relevant for future research and education applications of self-determination for students with autism.

The first research question addresses whether there are four dimensions underlying the 72 items of *The Arc's Self-Determination Scale* (SDS) in a sample of students with ASD. The results partially support the four-dimension of the SDS. The functional theory of self-determination holds that a self-determined individual acts autonomously, self-regulates behavior, and is psychologically empowered and self-realizing (Wehmeyer, 1999). Therefore, the construct of self-determination is established by four essential characteristics altogether, represented by the four subscales of the SDS (Autonomy, Self-Regulation, Psychological Empowerment, and Self-Realization). The findings of this study indicated that the parameter estimates (standardized factor loadings and factor correlations) and the model fit results supported the hypothesized factor structure, at least for the first three factors of the SDS, among students with ASD. The findings do not fully support the four-dimension structure in that three items loaded negatively onto Self-Realization, meaning that they are not measuring this essential characteristic of self-determination. Among four model fit solutions, only RMSEA has a somewhat favorable result, whereas the other three model fit solutions (WRMR , CFI, and TLI) are less than acceptable.

The second research question addresses whether there are two dimensions underlying the 24 items of the AIR Self-Determination Scale (AIR) in a sample of students with ASD. The results suggest the identified factor structure of the AIR Self-Determination Scale (AIR) is invariant in this sample, meaning that this survey is applicable to the population of students with ASD. The data on students with ASD supports the theoretical framework of self-determined learning theory (Mithaug et al., 2003; Wolman, Campeau, Dubois, Mithaug, & Stolarski, 1994). A central theme of self-determined learning theory is that people who are more self-determined have greater capacity to frequently learn about, deal with, adjust to, and shape different circumstances as well as experience favorable opportunities for producing self-determined gain. Capacities and opportunities for self-determination affect prospects for self-determination.

Implications for Research

Such findings could provide research applications in two ways. First, some items require participants to respond to a double negative statement. It presents certain level of difficulty when a student decides whether to agree or not agree on the statement such as item number 66 saying "I don't accept my own limitations." This finding makes sense considering the nature of this disability and how individuals with ASD are very likely to have some challenges in language comprehension and in context processing, which is one of the defining ASD-related characteristic differences (Tager-Flusberg, Paul, & Lord, 2005). As such, before the findings can be interpreted that for this specific population of students with autism, the items need to be revised or restated to more accurately measure the self-realization factor. Those survey items in the fourth subscale might have different underlying structures that are not directly and consistently associated with the factor, Self-Realization. Especially for the non-significant and negative loading items, they might measure different aspects of self-determination rather than

self-realization. This is an issue of content validity of this subscale. Content validity, the extent to which items measuring a latent construct are a homogeneous representation of the possible items measuring the construct, is indicated by the items' loadings on a construct (Bollen, 1989). Content validity is high when the standardized factor loadings are significant. However, in the self-realization factor, four items do not show significant factor loadings and more problematic is that three of the four items result in negative loadings. Therefore, the content validity is reduced in this subscale. Since the results show that three-factor solution is more acceptable than the four-factor solution, suggestions for future research might be to revise the double negative statements and make the statements more explicit to reduce the requirement for higher language skills and to better reflect their answers to self-realization items. In addition, researchers could add additional items or open-ended responses to confirm and further explain respondents' opinions on items require higher language comprehension skills. Another suggestion would be providing examples of paraphrasing or alternative expressions to meet individual needs of survey respondents. These findings are relevant for future research as they necessitate the consideration of careful accommodations and modifications for students with ASD in order to increase the predictability and consequently better support the four-factor dimension of the SDS.

The findings of second research questions suggest that the two subscales of AIR represent *capacity* (knowledge, abilities, and perceptions) and *opportunity* (chances allowing application of knowledge and abilities). The findings show an adequate reliability and validity in measuring capacity and opportunity for self-determination for students with ASD. The results of high and significant standardized factor loadings suggest a satisfactory content validity of this scale. Therefore, the items of this survey are valid measure of self-determination among students with ASD.

The CFA results of the two research questions have application to future research in that the factors of these two surveys can be used as reliable outcome variables for experimental design studies investigating intervention/program effects of promoting self-determination in autism population. A CFA model corrects for measurement error in the items (Little, Lindenberger, & Nesselroade, 1999) and is often used to determine the reliability measurement. In the CFA framework, reliability is the extent to which a latent construct's variance represents 'true' variance versus 'error' variance. As an indirect measure of reliability, the explained variance of the items indicated high reliability for each of the scales (mean = .32, median = .33 for SDS; mean = .61, median = .63 for AIR). As a result, high reliability translates to reliable outcome variables useful for detecting treatment effects of interventions.

More specifically, if the purpose of an intervention is to measure specific elements or sub-domains of self-determination (e.g., autonomy or capacity) rather than the overall levels of self-determination, this study suggests that three factors (Autonomy, Self-Regulation, Psychological Empowerment) from SDS and two factors (Capacity, Opportunity) from AIR are more appropriate variables because of the strong factor loading results and model fit solutions. For example, improving social competence and inclusion has been the main force of autism-related research (Bellini, Peters, Benner, & Hopf, 2007), and based on the recent integrated model, social effectiveness and social inclusion are mediating variables in efforts to promote self-determination (Wehmeyer, Shogren, Zager, Smith, & Simpson, 2010). In this sense, future research could use the factors of these two measurements as outcome variables to determine the effectiveness of environmental modification (family involvement, goal planning in school environments) and the improvement of personal variables (self-determination related competencies, adaptive behaviors). In addition, Pierson and colleagues (2008) suggested that

social skills were a strong predictor of teachers' rating of students' capacity for self-determination in students with learning disabilities as measured by the AIR. Social skills are regarded as a commonly investigated variable in research of educating students with ASD, including social competence, social initiation/response, social engagement, social communication, emotion recognition/management, personal relationships and many more (Beaumont & Sofronoff, 2008; Bellini, Peters, Benner, & Hopf, 2007; McConnell, 2002; Sansosti & Powell-Smith, 2008).

Therefore, future studies could use the factors as outcome measures to further compare the documented results with a sample of students with ASD to see if social skills are also a predictor of teachers' rating of students' self-determination. In addition to experimental studies, another implication can be drawn in correlational studies. The results of valid and reliable surveys allow the factors to serve as dependent variables in correlational studies such as observational research or survey research to examine the associations between level of self-determination and the sensory, cognitive and social experiences of students with autism. This type of correlational studies would add valuable information to the recent research focus of behavioral and cognitive differences in individuals with ASD (Mundy & Burnette, 2005; Thede & Coolidge, 2007). Or, these factors could be used to establish the linkage between self-determination and other crucial variables such as employment (Wehmeyer & Schwartz, 1997), social relationship and independence, adaptive behaviors (Shogren, Faggella-Luby, Bae, & Wehmeyer, 2004), and social anxiety (Bellini, 2006; Mukaddes, Hergüner, & Tanidir, 2010; White & Roberson-Nay, 2009).

Implications for Educators

The reliability and viability of the SDS and AIR has been established in students with

disabilities, mainly with intellectual disability and learning disabilities (Shogren et al., 2008), and the findings of this study support the potential utility of the two measures in assessing the self-determination of students with ASD. For educational and policy considerations, educators can feel confident that these two measures can be used with students with ASD, especially for transition-aged students, ages 16 through 21 years. This is important because of the general consensus that efforts in promoting the self-determination of adolescents with disabilities are considered one of the components of high quality special education services in secondary education and transition services (Carter et al., 2006; Wehmeyer et al., 2007; Wehmeyer, Shogren, Zager, Smith, & Simpson, 2010). For instance, the assessments can be used in the transition planning process to support service providers and students with ASD and their families to design appropriate individualized supports and accommodations in hopes of promoting active participation. Research has consistently shown that students with ASD need comprehensive information and careful preparation and appropriate supports to participate meaningfully in transition planning (Hagner et al., 2012; Hart, Grigal, & Weir, 2010; Hendricks & Wehman, 2009) and the two surveys would provide information about students' needs and strengths in different aspects of self-determination.

In addition to assessment purposes, given that CFA has already confirmed the factor structures of the two measurements and has proved that the factors can be used as outcome measures, educators can design and implement instructional activities to promote these outcomes in students with ASD. Knowing the structures/factors of the scales also enable educators to better understand the different aspects of self-determination, especially research has demonstrated that these two measures assess distinct aspects of the self-determination construct (Shogren et al., 2008). Educators can select what information they need to gather from their

students with ASD as well as decide what self-determination goals they are going to incorporate for instructional purposes. For instance, educators could apply curricula and materials designed to promote self-determination for students with disabilities (Test, Karvonen, Wood, Browder, & Algozzine, 2000; Wehmeyer & Field, 2007) and modify them to meet the unique learning needs of their students on the autism spectrum. Or teachers could implement a program that directly targeting at students with autism, such as Putting Feet on My Dreams (Fullerton, 1994, 1998) where specific areas of self-knowledge about autism, communication, and organization are identified as key components to developing concepts of self-determination.

Moreover, there are effective instructional strategies and models to support teachers to encourage more self-determination acquisitions and opportunities for their students. For instance, visual organization and social information are empirically documented to be effective instructional strategies in teaching skills and concepts for self-determination in young adults with ASD (Fullerton & Coyne, 1999). Visual organization includes systematic presentation of visual information to connect ideas and concepts during instructional activities. Social information is a crucial instructional strategy for students with autism to understand their roles of themselves and the rules of activities they are engaged in. This strategy of providing information about social situations is supported by the recent literature documenting that social skills are a strong predictor of students' capacity for self-determination in youth with high-incidence disabilities, including students with ASD (Pierson, Carter, Lane, & Glaeser, 2008). Other effective instructions are interventions to promote goal setting and attainment, problem solving, decision-making self-evaluation and self-reinforcement (Algozzine, Browder, Karvonen, Test, & Wood, 2001).

Limitations

In terms of external validity, one limitation of this study is related to the issue of representativeness of population. First the small sample size (N = 95) does not guarantee the generalizability across samples and settings. Especially autism spectrum disorders have five subgroups of classification and small sample size might potentially affect the feasibility to generalize the results to whole populations of students on the autism spectrum.

Conclusion

In summary, in addition to the already documented reliability of *The Arc's Self-Determination Scale* (SDS) and *AIR Self-Determination Scale* (AIR) for students with intellectual disability and learning disabilities, this study further confirmed the validation of the two measures for students with autism spectrum disorders. Therefore, the two measures in this study are useful in measuring level of self-determination for students with ASD, which can be used in transition planning. Also, another implication is that three factors (Autonomy, Self-Regulation, Psychological Empowerment) from *The Arc's Self-Determination Scale* and two factors (Capacity, Opportunity) from the *AIR Self-Determination Scale* can be used as reliable outcome variables or dependent variables in educational research. Since the results indicated the fourth subscale, Self-Realization, from *The Arc's Self-Determination Scale* had non-significant and some negative loadings, future research could further investigate the utility of modified versions of items on that subscale for use with students with ASD.

CHAPTER 3: COMPARISONS OF SELF-DETERMINED BEHAVIORS AMONG STUDENTS WITH AUTISM, INTELLECTUAL DISABILITY, AND LEARNING DISABILITIES: A MULTIVARIATE ANALYSIS

The development of theoretically-based models and instructional strategies to promote self-determination has provided implications for research and practice over the past 20 years and efforts to promote self-determination are best practice in transition and secondary education (Pierson, Carter, Lane, & Glaeser, 2008; Wehmeyer, Shogren, Zager, Smith, & Simpson, 2010). Efforts to promote self-determination have been linked to improved academic and functional goal attainment and enhanced access to the general education curriculum (Lee, Wehmeyer, Palmer, Soukup, & Little, 2008), more positive transition outcomes (Williams-Diehm, Wehmeyer, Palmer, Soukup, & Garner, 2008), and improvement in quality of life and other positive adult outcomes (Lachapelle et al., 2005; Wehmeyer & Palmer, 2003). Algozzine, Browder, Karvonen, and colleagues (2001) conducted a comprehensive meta-analysis of the effectiveness of strategies and interventions to promote self-determination, determining that such efforts resulted in positive educational outcomes. Although there is a substantive knowledge base on the level of self-determination of students with disabilities (Grigal, Neubert, Moon, & Graham, 2003) and pertaining to the personal and environmental factors related to self-determination (Lee et al., 2010; Shogren et al., 2007; Stancliffe, Abery, & Smith, 2000; Wehmeyer & Garner, 2003), there is a limited amount of research focused on issues pertaining the differences in levels of self-determination between and among students with different types of disabilities (Carter, Lane, Pierson, & Glaeser, 2006). The literature base contains documentation of the self-determination status of students with disabilities, especially students with intellectual disability or learning disabilities (Martin et al., 2006; Shogren et al., 2007; Trainor, 2005; Zhang, 2001), but far less

research has been conducted to examine the self-determination of students with autism spectrum disorders (ASD).

Self-Determination for Students with Intellectual Disability or Learning Disabilities

Research findings suggest that students with intellectual disability or learning disabilities are less self-determined than their peers without disabilities, including holding more external perceptions of control, demonstrating limited independent problem-solving skills, having limited autonomy, and being less success in searching and maintaining employment (Field, Sarver, & Shaw, 2003; Wehmeyer , 2006; Wehmeyer & Schalock, 2001). Besides possessing limited self-determination, students with disabilities often experience fewer opportunities to develop skills and knowledge related to self-determination than do their peers (Stancliffe, Abery, Springborg, & Elkin, 2000; Stancliffe & Wehmeyer, 1995). Stancliffe and colleagues (2000) compared the personal control of 74 adults with intellectual disability living in different types of community settings, suggesting that people who lived in semi-independent settings exercised more personal control than individuals living in larger living-unit sizes. Field (1996) identified several unique barriers impeding the development of self-determination for students with learning disabilities, including lack of self-awareness due to the nature of hidden disabilities, learned-helplessness, self-deprecating attributions, and limited executive skills related to the development of self-determination. Trainor (2005) examined perceptions of and behaviors related to self-determination of 7 culturally and linguistically diverse students with learning disabilities and the impact on their self-determination, and determined that family members were critical in the process of transition planning and that home contexts provided more productive self-determination opportunities than did school settings. Pierson and colleagues (2008) examined the self-determination of 90 transition-age students with high-incidence disabilities, including 47

youth with learning disabilities. The results suggested that students who demonstrated better social skills were perceived to have greater capacity for self-determination. This result of the importance of a communication and social skills component to self-determination also corresponded to findings by Carter, Lane, Pierson, and Glaeser (2006) indicating that social skills had mediating effects on self-determination as reported by youth with learning and emotional disabilities. In a study comparing issues of self-determination across disability categories, Wehmeyer (1994) suggested that adolescents and adults with intellectual disability had less adaptive attributions of efficacy/expectancy than their peers without disabilities or with learning disabilities. In addition, students who exhibit limited skills and knowledge related to self-determination also experience fewer educational opportunities to develop and practice self-determined behavior (Wehmeyer & Palmer, 2003). For example, teachers reported incorporating fewer self-regulated learning strategies into instructional design when working with students with more severe cognitive limitations, when compared to working with students who need only limited or intermittent support, such as students with learning disabilities (Wehmeyer, Agran, & Hughes, 2000).

Self-Determination and Students with Autism

Several research studies have indicated that social skills of students with disabilities might mediate differences in self-determination among students with emotional disturbances and learning disabilities (Carter, Lane, Pierson, & Glaeser, 2006; Pierson, Carter, Lane, & Glaeser, 2008). The same results might have relevance to students with autism spectrum disorders (ASD) because the majority of students on the spectrum have deficits in the area of social skills and social understanding that could potentially limit their abilities to develop self-determination as well as minimize their access to opportunities to perform self-determined behaviors (Wehmeyer,

Shogren, Zager, Smith, & Simpson, 2010). In addition, research has shown that students with autism are less likely to receive services in general education settings (Yianni-Coudurier et al., 2008), which may, again, minimize the opportunity for students with ASD to develop and perform self-determined behaviors.

Hypothesizing that students with ASD may have difficulty understanding the concepts related to self-determination, Fullerton and Coyne (1999) conducted pre-post intervention interviews with 23 adolescents and young adults with autism and/or Asperger syndrome. Results indicated that self-knowledge regarding autism and coping skills for the sensory, cognitive, and social challenges played an important role in the development of self-determination. In addition, these authors identified visual organizers and social information as useful instructional strategies for developing self-determination related knowledge and skills. The emphasis on self-awareness of autism-related abilities and limitations could be also found in Faherty's (2000) approach of guiding students on the spectrum to understand the impact of their disability as well as to support their life planning and self-directed goal setting and actions.

Considering all the individual differences in communication and social interaction, a social-ecological approach to promoting self-determination was suggested as one of the research-based practices for educating students with autism (Wehmeyer, Shogren, Zager, Smith, & Simpson, 2010). The model encompasses various individual and environmental variables necessary for effective design and evaluation of interventions to promote self-determination. Specifically, three forms of social behavior are regarded as mediator variables to the promotion of self-determination, including social effectiveness (ability to use social skills and strategies), social capital (networks of social ties and supports), and social inclusion (societal acceptance of people with disabilities).

Statement of the Problem and Purpose of Study

In summary, the literature suggests that students with autism, intellectual disability and learning disabilities, in general, often possess limited skills and knowledge pertaining to self-determination as well as being given fewer opportunities to develop self-determination. Although the literature has documented effective strategies to promote skills leading to the enhanced self-determination of students with ASD (Burton-Hoyle, 2011; Fullerton & Coyne, 1999; Wehmeyer, Shogren, Zager, Smith, & Simpson, 2010), to date limited research has looked into the association between disability groups, especially autism spectrum disorder, and levels of self-determination.

Therefore, the purpose of this study was to investigate whether there are differences across students in three disability categories (students with autism, intellectual disability, and learning disabilities) on self-reported levels of self-determination as measured by two widely-used assessments, *The Arc's Self-Determination Scale* (SDS; Wehmeyer & Kelchner, 1995) and the *AIR Self-Determination Scale* (AIR; Wolman, Campeau, Dubois, Mithaug & Stolarski, 1994), by performing a Multivariate Analysis of Variance (MANOVA). The ultimate purpose is to provide useful and empirical evidence for the design and delivery of interventions for promoting and enhancing self-determination for *all* students with disabilities.

Method

Multivariate analysis of variance (MANOVA) was performed to examine differences in self-determination scores from two measures, including measures of Autonomy, Self-Regulation, Psychological Empowerment, Self-Realization, Capacity, Opportunity among three disability groups (autism [ASD], intellectual disability [ID], learning disabilities [LD]).

Participants

A total of 222 middle and high school students (*M* = 22.56; *SD* = 2.71) served under the categories of intellectual disability, learning disabilities, or autism were included in this study. All participants provided informed consent from parents or guardians and were participants in several research studies examining efforts to promote self-determination. Originally, 309 participants were within the identified special educational category of intellectual disability, 529 were labeled as having learning disabilities, and only 95 had identified autism. From this larger group, 222 participants were selected for this study by using propensity score matching (Guo & Fraser, 2010) that yielded three disability groups of an equal size (*N* = 74) that were equivalent in terms of demographic characteristics. More details of the matching procedure are provided in the following analytic procedures section. Table 1 lists demographic information, including age, gender, and race/ethnicity of the study sample.

Data were obtained through an IRB approval, parental consent process. Since additional data were collected to increase the size of the group of participants with autism spectrum disorders, the investigator recruited additional students. District personnel were contacted to obtain permission to collect self-determination related data. After districts agreed to participate, student participants were recruited through special education teachers who also agreed to participate in the study. Guidelines for nominating participants were provided to the teachers prior to selection. Students who meet inclusion criteria for this study: (a) ranged in age from 13 to 22 years during the 2010-2011 school year; (b) received special education services under the category of autism (including students with Asperger syndrome and other autism spectrum disorders); (c) were able to communicate preferences and interests (might use augmentative communication or other communicative devices); and (d) were able to respond to open-ended

questions such as “What goals are you are working on?” or “What do you like to do in your free time?” Data from two measures of self-determination were collected from participating students. After being trained about the appropriate administration protocol, teachers and research investigators administered two measures of self-determination to participating students.

Instrumentation

The Arc’s Self-Determination Scale. *The Arc’s Self-Determination Scale* (SDS; Wehmeyer & Kelchner, 1995b) is a 72-item self-report measure that provides data related to students’ global self-determination and in each of four essential characteristics of self-determined behavior (Wehmeyer, Kelchner, & Richards, 1996). The first section (32 items) measures *Autonomy*, including a person’s levels of independence and capacity to act based on personal beliefs, values, and interests. Items in the first section are rated on a scale from 0 (I do not even if I have the chance) to 3 (I do every time I have the chance). Section two (9 items) of the SDS measures *Self-Regulation*, including means-end problem solving and goal-setting and task performance. For items in the means-end problem solving section, scores are assigned on a scale of 0 to 2 points, depending on the effectiveness of student’s solution to resolve the problem. For items in the goal setting and task performance section, scores are accumulated based on the presence of a goal and the number of steps identified to reach that goal (0=no plan, 1= goal without steps, 2= goal with 1-2 steps, 3= goal with 3-4 steps). The third section of the SDS (16 questions) measures *Psychological Empowerment*, reflecting a person’s perceptions of control, efficacy, and outcome expectations. Scores are assigned with either 0 (answer not reflecting a psychologically empowered belief) or 1 (answer reflecting a psychologically empowered belief) point. The fourth section (15 items) measures *Self-Realization*, including self-awareness and self-knowledge. Scores are assigned with either 0 or 1 points based on if the answer reflects

positive self-awareness and self-knowledge. Subscale scores on the four sections are calculated and summed to yield a total self-determination score. A maximum total score of 148 points is possible, with higher scores indicating elevated levels of self-determination. The SDS was normed with 500 adolescents with cognitive disabilities (Wehmeyer, 1996). It was proven to have adequate reliability and validity in measuring self-determination of adolescents with cognitive disabilities (Cronbach's alpha = .90). The SDS has been used to validate the positive associations between promoting self-determination and positive outcomes (Williams-Diehm, Wehmeyer, Palmer, Soukup, & Garner, 2008; Wehmeyer & Palmer, 2003) as well as to provide evidence of successful results in intervention studies (Lee, Wehmeyer, Palmer, Soukup, & Little, 2008; Wehmeyer, Palmer, Agran, Mithaug, & Martin, 2000).

The AIR Self-Determination Scale. The *AIR Self-Determination Scale* (AIR; Wolman, Campeau, Dubois, Mithaug & Stolarski, 1994) measures a person's capacities for and opportunities pertaining to self-determination, and is available in Student, Educator, and Parent versions. For the purpose of this study, the 24-item Student version (AIR-S) was used. The Capacity subscale contains 12 questions about things students do related to self-determination ("Things I Do" section) and how students feel about performing these-self-determination behaviors ("How I Feel" section). The Opportunity subscale contains 12 questions about students' perceptions of their opportunities to perform self-determined behaviors at home and at school. Scores are rated on a Likert scale ranging from 1 (Never) to 5 (Always). The Capacity and Opportunity subscale scores are calculated as well as a total Self-Determination score by summing these two subscale scores. The AIR was developed and normed with 450 students with and without disabilities and their teachers (Wolman et al., 1994). It was proven to have adequate reliability and validity in measuring students' capacity and opportunity for self-determination.

Analytic Procedures

First, the participants' performance on the SDS and AIR were summarized to examine student self-determination within and between disability groups (ID, ASD, LD). Second, to answer the research question pertaining to whether the three disability groups differed in terms of level of self-determination, MANOVA was conducted on four subscale scores of the SDS (Autonomy, Self-Regulation, Psychological Empowerment, Self-Realization) and two subscale scores of the AIR (Capacity, Opportunity). When group effects were significant, group means were pairwise compared using a Bonferroni-corrected *p*-value in separate univariate tests. Statistical significance was determined at .05 alpha level and all analyses were conducted using Statistical Package for Social Science (SPSS) 20.0.

Prior to analysis, propensity score matching was used to have comparable cases in different disability category groups. Matching began with 95 students with ASD, 309 with ID, and 529 with LD and proceeded separately for the ASD and ID groups and the ASD and LD groups. The matching process followed the recommended procedures and guidelines described in Guo and Fraser (2010). First, a propensity score *p* was derived from an estimated logistic regression model:

$$P(W_i|X_i = x_i) = \frac{1}{1 + e^{-x_i\beta_i}},$$

where the covariates x_i included students' age, gender, and ethnicity (Rosenbaum & Rubin, 1983). Second, matching pairs were drawn using the nearest neighbor matching algorithm (i.e., greedy matching or 1-to-1 matching) with a caliper value of 0.25 (D'Agostino, 1998). Third, the final sample for the ASD group (and thus the final samples for the ID and LD groups as well) was limited to only those students who had an identified match in both the ID and LD groups. This step made it possible to compare each of the three groups against one another, providing the

ability to look at more relationships than only that of the ASD group against each comparison group individually. Consequently, the resulting final sample for each of the three groups consisted of 74 students. Finally, covariate balance was checked with the matched final samples by comparing means (age) or frequencies (gender, ethnicity) between the three groups. No significant group difference was observed, suggesting that comparable cases of the three disability groups could be derived from the propensity score matching.

Results

One-way between-subjects multivariate analysis of variance was performed on six dependent variables (DVs): autonomy, self-regulation, psychological empowerment, self-realization, capacity, and opportunity. Independent variable was disability group with three levels (ASD, ID, LD). Assumptions of normality and linearity were satisfactory in this study. However, the homogeneity of variance and covariance assumption was not met (Box's M = 78.78, F [42, 133122] = 1.82, $p < .001$) and thus Pillai's trace criterion was used for multivariate test.

Overall group effect was significant, $F(12, 416) = 2.60$, $p < .01$, partial $\eta^2 = 0.07$, indicating significant group differences in the combined DVs. Thus, univariate test followed for each of the six DVs (see Table 2). There was significant group effect in Autonomy, $F(2, 212) = 3.92$, $p < .05$, partial $\eta^2 = 0.04$. Results of post-hoc comparison showed that students with ASD (M = 53.15, SE = 1.87) had significantly lower levels of autonomy compared to those with LD (M = 60.10, SE = 1.83). Group effect was also significant in Self-Realization, $F(2, 212) = 3.05$, $p < .05$, partial $\eta^2 = 0.03$, but pairwise group differences were not statistically significant at .05 alpha level (see Table 3).

Table 6

Demographics by Group

Variables	ASD (%)	ID (%)	LD (%)
Age	22.56 (3.14)	22.96 (2.52)	22.18 (2.43)
Gender			
Male	61 (82.4)	60 (81.1)	58 (78.4)
Female	13 (17.6)	14 (18.9)	16 (21.6)
Race/ethnicity			
White	57 (77.0)	55 (74.3)	53 (71.6)
Hispanic/Latino	9 (12.2)	8 (10.1)	9 (12.2)
African American	6 (8.1)	4 (5.4)	6 (8.1)
Asian/Pacific Islander	0 (0.0)	1 (1.4)	0 (0.0)
Native American	1 (1.4)	1 (1.4)	1 (1.4)
Other	1 (1.4)	3 (4.1)	1 (1.4)
Missing	0 (0.0)	2 (2.7)	4 (5.4)

Note. *M* (*SD*). ASD = autism, ID = intellectual disability, LD = learning disabilities.

Table 7

Results of Univariate Tests

Dependent variable	Num. *df*	Den. *df*	*F*	*p*	Partial η^2
Arc's Self-Determination scale					
Autonomy	2	212	3.92	.02	.04
Self-Regulation	2	212	2.75	.07	.03
Psychological Empowerment	2	212	2.44	.09	.02
Self-Realization	2	212	3.05	.05	.03
AIR Self-Determination scale					
Capacity	2	212	0.36	.70	.00
Opportunity	2	212	1.34	.26	.01

Table 8

Group Means and Results of Pairwise Comparisons

Dependent variable	ASD	ID	LD	p^1	p^2	p^3
Arc's Self-Determination scale						
Autonomy	53.15 (1.87)	58.72 (1.85)	60.10 (1.83)	.11	.03	1.00
Self-Regulation	10.19 (.56)	8.65 (.55)	10.29 (.55)	.16	1.00	.11
Psychological Empowerment	12.65 (.32)	12.42 (.31)	13.35 (.31)	1.00	.34	.11
Self-Realization	11.21 (.33)	10.39 (.32)	11.45 (.32)	.21	1.00	.06
AIR Self-Determination scale						
Capacity	46.47 (1.02)	45.35 (1.01)	46.30 (1.00)	1.00	1.00	1.00
Opportunity	31.09 (1.29)	28.52 (1.27)	28.51 (1.26)	.48	.46	1.00

Note. M (*SE*). ASD = autism, ID = intellectual disability, LD = learning disabilities. p^1 = *p* value for comparing ASD vs. ID. p^2 = *p* value for comparing ASD vs. LD. p^3 = *p* value for comparing ID vs. LD.

Discussion

The purpose of this study was to examine differences on two measures of self-determination, *The Arc's Self-Determination Scale* (SDS) and the *AIR Self-Determination Scale* (AIR), among students in three disability category groups (autism [ASD], intellectual disability [ID], and learning disabilities [LD]). The findings indicated that: (a) students with ASD and ID and LD were different in scores on the scale domains that served as the six dependent variables: autonomy, self-regulation, psychological empowerment, self-realization, capacity, and opportunity, (b) students with ASD had lower levels of autonomy compared to students with LD, and (c) all three groups were different in the self-realization domain. Implications for future research and educational practice are drawn from the findings.

MANOVA results indicated significant difference of the combination of six dependent variables (autonomy, self-regulation, psychological empowerment, self-realization, capacity, and opportunity) among three disability groups. That is, students with autism (ASD), intellectual disability (ID) and learning disabilities (LD) had differing profiles when examining domains of self-determination. Further, looking at the univariate tests of each dependent variable, significant group differences were found in the Autonomy and Self-Realization domains. Following up on the group differences with pairwise comparisons, results show that students with ASD exhibited lower levels of autonomy when compared with students with LD. This adds to previous research that has consistently found that students with ID and LD have limited self-determination, including autonomy (Lane, Carter, Pierson, & Glaeser, 2006; Pierson, Carter, Lane, & Glaeser, 2008; Wehmeyer & Kelchner, 1995a; Trainor, 2005). The current study suggests that students with ASD display even lower autonomous functioning than students with LD, which provides direct implications for the need to design effective instructional strategies to promote self-

determination for students with ASD, perhaps especially in the area of autonomous functioning. Even though no previous studies have compared levels of self-determination between these two disability groups, the existing literature has documented that social skills ratings are moderately correlated with overall levels of self-determination (Faherty, 2000; Fullerton & Coyne, 1999; Nota, Ferrari, Soresi, & Wehmeyer, 2007; Pierson, Carter, Lane, & Glaeser, 2008).

Therefore, when factoring the social aspects of the characteristic differences into the performance of self-determined behaviors, it is suggested that students with ASD may have lower autonomy than students with LD. This is still, however, a finding that needs more extensive research to determine if social skills are a dominant predictor of any aspects of self-determination and/or overall self-determination. In addition to disability category as an independent variable, future research could employ other moderating variables of relevance to compare levels of self-determination, such as types of educational settings or levels of social engagement with peers. Moreover, another significant group difference in the essential characteristics of self-realization was found but in the follow up pairwise comparison, this study was not able to determine which two groups were significantly different from one another. In this sense, future research could examine group differences in each of the essential characteristics of self-determination to provide a more completed profile of self-determined behaviors.

Implications for Research

Since this study found significant differences in levels of self-determination among disability category groups, future research could subsequently investigate the group differences in the component elements of self-determined behavior. To enable students with disabilities to become more self-determined, an array of interrelated component elements is essential to the

development of self-determined behavior, in areas such as choice making, goal setting/attainment, self regulation, problem solving, and perceptions of efficacy and control (Wehmeyer, Abery, Mithaug, & Stancliffe, 2003, p.189). These component elements are directly related to instructional methods in promoting self-determination and can be tailored to meet individual needs of students if one or more specific skills (e.g., self-regulation or problem solving) are considered challenging areas. Investigation within component elements of self-determined behavior is an important endeavor because the development of these skills could ultimately contribute to enhanced overall self-determination. For example, Wehmeyer (1994) compared the adaptive attributions of efficacy/expectancy between adolescents and adults with intellectual disability and adolescents and adults with learning disabilities, resulting in the finding that participants with ID had less adaptive attributions. There is, however, no empirical evidence showing the performance on these component elements of students with autism and also no research comparisons between disability categories. Therefore, in addition to investigating differences on global self-determination by varied disabilities, future studies could further our understanding of different profiles of self-determination by providing more information about students' performances on the component elements of self-determined behavior which can be measured with existing reliable and valid measurement tools so that effective strategies could be developed accordingly.

Implications for Educators

The findings of significant group differences on both *The Arc's Self-Determination Scale* (SDS) and the *AIR Self-Determination Scale* (AIR) show that students with ASD, ID and LD have distinct profiles of instructional needs in promoting self-determination. The differences and needs of varied disability groups give important information for educators in terms of

instructional focus. While it is important for future educational research to determine which factors or moderating variables contribute to the group differences and/or what aspects of self-determination differ among groups, the findings of this study have direct implications for the practice. Core characteristics of different disability categories might impact student self-determination. For the three disabilities represented in this study, some of the characteristics are similar, such as requiring more prompts to be successful and more instructional supports to generalized learned skills across settings, that were consistently observed among students with autism, ID and LD. However, some characteristics, in such areas as social interaction and communication skills, pose consistent problems for students with autism. In this sense, these defining characteristics may have impact on students' performances of self-determined behaviors and it is important for teachers to provide instructional supports responsive to the individual needs of students. For example, educators could give clear definitions and examples, as well as provide visual information, when teaching students with autism the concepts of self-determination to address their difficulties in communication and understanding any abstract concepts (Wehmeyer, Shogren, Zager, Smith, & Simpson, 2010).

In addition to social and communication differences, students with ASD were reported to have fewer opportunities to be taught in general education settings than students with other disabilities (Burton-Hoyle, 2011). That implies that they may have fewer opportunities to develop and practice self-determined behaviors. Since capacity and opportunity for self-determination are two subscales of the *AIR Self-Determination Scale* (AIR), it is very likely that this contextual factor related to services in less-inclusive settings might have impact on students' overall levels of self-determination. Relatedly, research has also indicated that the two subscales of the AIR, Capacity and Opportunity, might measure the precursors to the development of the

essential characteristics of self-determined behavior, including autonomy, self-regulation, psychological empowerment, self-realization (Shogren et al., 2008).

Therefore, it is important for teachers to create meaningful educational opportunities to foster students' self-determined behaviors, especially for students with ASD, in inclusive settings. Instructional strategies to promote component elements of self-determined behavior are considered evidenced-based practice to increase opportunities for self-determination and to enhance students' overall levels of self-determination (Algozzine, Browder, Karvonen, Test, & Wood, 2001; Pierson, Carter, Lane, & Glaeser, 2008; Wehmeyer, Shogren, Zager, Smith, & Simpson, 2010). For instance, providing opportunities on a regular basis to make choices may give students a perception of control over their environment. Research has shown the increase of adaptive behaviors and decrease in problem behaviors when students are provided with opportunities to exercise choice making and decision making (Shogren, Faggella-Luby, Bae, & Wehmeyer, 2004). Problem solving is another area of instructional focus that can be blended in the design and delivery of the interventions to purposefully teach students personal problem solving such as that used within math or science and interpersonal or social problem-solving (Wehmeyer & Schalock, 2001). Related research findings indicated the association between lack of independent problem-solving and barriers to autonomy in adults with moderate or severe intellectual disability (Bambara & Gomez, 2001). Specifically, the results of this study found students with ASD performed significant lower in autonomy than students with LD, highlighting the needs to develop and practice problem-solving skills. Moreover, instructions in self-regulation and student-directed learning skills are also identified as learning needs by substantial numbers of students with disability. Self-regulation skills have also been empirically proven to have positive correlations with classroom involvement (Agran, Sinclair, Alper, Cavin, Wehmeyer,

& Hughes, 2005), academic performance (Uberti, Mastopieri, & Scruggs, 2004), and problem solving skills (Palmer, Wehmeyer, Gibson, & Agran, 2004).

Limitations

The first limitation is the issue of small sample size. Seventy-four participants for each disability group may limit the power and may potentially lower the strength of main effects found in this study. In addition, this study only includes three disability categories and therefore may limit the group diversity and its representativeness. This would potentially affect the feasibility to generalize the results to the whole populations of students with ASD, ID, and LD.

Conclusion

In summary, this study suggested that somewhat different profiles of self-determination are presented among students who are identified with autism, intellectual disability, and learning disabilities. For research implication, this is still an under-researched area for future researchers to determine the predictors or moderating variables contributing to students' different levels of self-determination so that effective strategies and programs can be developed to support efforts to promote self-determination. For educators, the comparison among students receiving special education services under different categories informs practitioners that qualitatively different instructional supports are needed to promote the development of self-determination for students with multifaceted needs. One of the research-based principles to promote self-determination is to incorporate instruction in the component elements of self-determined behavior into existing interventions to improve school and transition outcomes (Algozzine, Browder, Karvonen, Test, & Wood, 2001; Lee, Palmer, & Wehmeyer, 2009; Wehmeyer, Shogren, Zager, Smith, & Simpson, 2010).

CHAPTER 4: CONCLUSION AND IMPLICATIONS

Previous research has established an empirical link between promoting self-determination and positive educational outcomes, including academic performance, employment, independence, and overall quality of life (Carter, Lane, Pierson, & Glaeser, 2006; Field, Sarver, & Shaw, 2003; Martin et al., 2003; Wehmeyer & Palmer, 2003; Williams-Diehm, Wehmeyer, Palmer, Soukup, & Garner, 2008). More recently, causal relationships have been established between (a) efforts to promote self-determination and enhancement of self-determination of students with disabilities (Palmer, Wehmeyer, Shogren, Williams-Diehm, & Soukup, 2012; Wehmeyer, Palmer, Lee, Williams-Diehm, & Shogren, 2011; Wehmeyer, Palmer, Shogren, Williams-Diehm, & Soukup, 2013); (b) enhanced self-determination and more positive school outcomes including academic and functional goal attainment and access to the general education curriculum (Shogren, Palmer, Wehmeyer, Williams-Diehm, & Little, 2012; Wehmeyer et al., 2012); and (c) enhanced self-determination and more positive employment and independent living outcomes (Martorell, Gutierrez-Recacha, Pereda, & Ayuso-Mateos, 2008; Powers et al., 2012).

The above findings indicate that efforts to promote self-determination should be a part of the educational program of all students with disabilities. Although some research has been conducted investigating the differences between students with varied types of disabilities on self-determination (Pierson, Carter, Lane, & Glaeser, 2008; Shogren et al., 2007), few efforts have been undertaken to examine the self-determination of students with autism spectrum disorders (ASD). The unique characteristics of students with ASD affect their socialization and verbal and nonverbal communication, and may lead to specific areas of instructional and support need as it pertains to promoting self-determination (Field & Hoffman, 1999; Fullerton & Coyne, 1999). Therefore, there is a need to understand and enhance the self-determination of students with

autism, beginning with acquiring knowledge about the instruments measuring self-determination as applied to students with ASD and the potential differences in areas of instructional needs to promote self-determination by disability category. The research reported in this dissertation addresses this stated need and is twofold: (a) an investigation on the factor structures of two instruments to measure levels of self-determination of students with autism spectrum disorders (ASD) as discussed in Chapter 2, and (b) a comparison of the self-determination of students with ASD with students with intellectual disability (ID) and learning disabilities (LD) as discussed in Chapter 3.

Summary of Findings

The first study in this dissertation discussed the findings of an investigation of the validity of two norm-reference measures of self-determination, *The Arc's Self-Determination Scale* (SDS; Wehmeyer & Kelchner, 1995b) and the *AIR Self-Determination Scale* (AIR; Wolman, Campeau, Dubois, Mithaug & Stolarski, 1994). A Confirmatory Factor Analysis (CFA) revealed that, in general, the parameter estimates and the model fit results supported the hypothesized factor structure in the sample of 95 middle school and high school students identified with autism spectrum disorders (ASD), at least for the first three factors of the SDS and fully supported the two factors of the AIR.

First, the CFA model of the SDS examined the four common factors of *autonomy*, *self-regulation*, *psychological empowerment*, and *self-realization* and their 72 items (32, 9, 16, and 15 items, respectively). In terms of the predictability, all the standardized factor loadings were significant at a .05 alpha level, except for three items that load onto *Psychological Empowerment* (p = .28 – .89) and four items that load onto *Self-Realization* (p = .07 – .97). Of those four items in *Self-Realization*, three items had a negative loading, suggesting that they are not as effective

indicators of *Self-Realization* among students with autism (ASD). Overall, *Self-Regulation* yielded higher standardized factor loadings and thus greater predictability, followed by *Psychological Empowerment*, *Autonomy*, and *Self-Realization*. In terms of factor correlations, all factors were positively correlated at a .05 alpha level except for the correlation between *Self-Regulation* and *Self-Realization*. In terms of model fit solutions for the SDS, the root mean square error of approximation (RMSEA; Steiger & Lind, 1980) suggested a close fit of this model whereas comparative fit index (CFI; Bentler, 1990), Tucker-Lewis index (TLI; Tucker & Lewis, 1973), and weighted root mean square residual (WRMR; Muthén & Muthén, 1998–2010) all indicated less than acceptable. When *Self-Realization* was dropped from the model, CFI and TLI improved up to .89, which is very close to acceptable values of .90.

Second, the CFA model of the AIR examined the two common factors of *capacity* and *opportunity*, with 12 items per each factor. In terms of the predictability, all the standardized factor loadings were greater than .60 and significant at a .05 alpha level. *Capacity* produced somewhat higher standardized factor loadings (median = .80, range = .67 – .88) and thus greater predictability than did *opportunity* (median = .78, range = .62 – .83). In terms of factor correlations, the two factors were positively correlated at a .05 alpha level. In terms of model fit solutions for the AIR, it ranged from acceptable to close fit (RMSEA of .09, CFI of .94, TLI of .94) except for the WRMR (1.12). Thus, the model results supported the hypothesized factor structure of the AIR among students with ASD.

The second investigation of this dissertation discussed the findings of the comparison of the self-determination among 222 students with ASD, intellectual disability (ID), or learning disabilities (LD). One-way between-subjects multivariate analysis of variance (MANOVA) revealed that (a) students with ASD and ID and LD were significantly different in their overall

self-determination, (b) students with ASD had lower levels of *Autonomy* compared to students with LD, and (c) three groups of students were significantly different in *Self-Realization*.

Implications for Future Research

The overall CFA results, as discussed in Chapter 2, supporting the measurement properties and the hypothesized factor structures of the instruments, have a direct application to future research in that the factors can be used as reliable outcome variables useful for detecting treatment effects of experimental design studies promoting the self-determination of students with ASD. Moreover, if the purpose of a research study is to measure specific elements or sub-domains of self-determination (e.g., autonomy or capacity) rather than the global self-determination, this study suggests that three factors (*Autonomy, Self-Regulation, Psychological Empowerment*) from the SDS and two factors (*Capacity, Opportunity*) from the AIR are more appropriate variables because of the strong factor loading results. For instance, since social skills are regarded as a commonly investigated variables in research of educating students with ASD (Beaumont & Sofronoff, 2008; Bellini, Peters, Benner, & Hopf, 2007; McConnell, 2002; Sansosti & Powell-Smith, 2008), future research could establish the empirical associations between social skills (e.g., social competence, social initiation/response, social communication, personal relationships) and self-determination using these reliable outcome variables. The knowledge base now suggests that social skills were a strong predictor of teachers' rating of students' capacity for self-determination in students with learning disabilities as measured by the AIR (Pierson, Carter, Lane, & Glaeser, 2008). Future research could establish the evidence in the sample of students with ASD. Similarly, the recent integrated model indicates that social effectiveness and social inclusion are mediating variables in efforts to promote self-determination (Wehmeyer, Shogren, Zager, Smith, & Simpson, 2010). Besides the factors

having strong factor loadings results, future research is strongly encouraged to investigate more on the items that loaded negatively onto *Self-Realization* of the SDS. Negative loadings mean that the items are not measuring this essential characteristic of self-determination. More specifically, some items require participants to respond to a double negative statement, such as "I don't accept my own limitations." It presents certain level of difficulty given the fact that students with ASD are very likely to have some challenges in language comprehension and in context processing (Tager-Flusberg, Paul, & Lord, 2005). Future research should empirically examine the factor structure with a larger sample and, if necessary, the effect of rewording these items to eliminate double negative statements on overall factor structure of the SDS.

The MANOVA result, as discussed in Chapter 3, suggested significant group differences in self-determination among three disability groups. In addition to disability category as an independent variable, future research could employ other moderating variables of relevance to compare levels of self-determination, such as types of educational settings or levels of social engagement with peers. Moreover, the follow up results of pairwise comparisons suggested that students with ASD exhibited lower levels of autonomy when compared to students with LD. Besides *Autonomy*, another significant group difference was found in the essential characteristics of *Self-Realization*, but this study was not able to determine which two groups were significantly different from one another and, given the above mentioned questions about certain items in the Self-Realization section with students with ASD, this finding requires more examination. Future research could examine group differences in each essential characteristics of self-determination to provide a more completed profile of self-determined behaviors. Other subsequent research could also be done to compare the group differences in the component elements of self-determined behavior, such as such as choice making, goal setting/attainment, self regulation,

problem solving, and perceptions of efficacy and control (Wehmeyer, Abery, Mithaug, & Stancliffe, 2003, p.189).

Implications for Practice

Promoting the self-determination of students with disabilities has been shown to be a component of high quality special education services in secondary education and transition services (Test et al., 2009; Wehmeyer, Palmer, Shogren, Williams-Diehm, & Soukup, 2013; Wehmeyer et al., 2012). The findings of this dissertation examining the measurement properties and the hypothesized factor structures suggest that these two commonly used instruments are applicable to the population of students with ASD, though for a few items on the SDS, there may be a need for slight revisions. Even with the latter, however, the factor structure analyses suggested that educators can feel confident that these two measures can be used with transition-aged students with ASD. For example, the SDS and AIR can be used in the transition planning process to support teachers and students with ASD and their families to design appropriate individualized supports and accommodations in hopes of fostering students' active participation as the two measurements provide essential information about students' needs and strengths in different aspects of self-determination. In addition to assessment purposes, teachers could use the factors of self-determination as teaching objectives and outcome measures for instructional activities to promote enhanced self-determination while taking into consideration the specific learning needs of students with autism, such as self-knowledge about autism, communication, visual organization, and social information supports.

The findings of significant group differences on both *The Arc's Self-Determination Scale* (SDS) and the *AIR Self-Determination Scale* (AIR) provide important information for educators that (a) students with ASD, ID, and LD need instruction to promote self-determination; (b) the

existing instructional models and strategies (Fullerton & Coyne, 1999; Wehmeyer, Palmer, Agran, Mithaug, & Martin, 2000) might be beneficial to students with ASD; and (c) students with ASD need instructional emphases on several component elements as shown by the domain-level differences found in this study. Research consistently suggests that students with ID and LD have limited self-determination (Lane, Carter, Pierson, & Glaeser, 2006; Pierson, Carter, Lane, & Glaeser, 2008; Wehmeyer & Kelchner, 1995a; Trainor, 2005). This research suggests that students with ASD even display lower scores in overall self-determination as well as in the sub domain of autonomy than students with LD, which provides a direct educational implication for the instructional need to implement effective instructional strategies to promote the self-determination of students with ASD especially in the area of autonomous functioning. For instance, teachers could give clear definitions and examples as well as provide visual information when teaching students with autism the concepts of self-determination to address their difficulties in communication and understanding the abstract concepts (Wehmeyer, Shogren, Zager, Smith, & Simpson, 2010). Fullerton and Coyne (1999) provided three suggestions for teachers to support enhanced self-determination for young adults with autism, including (a) expanding their options and choices, (b) providing organization strategies and a structured learning environment to express and preserved ideas, and (c) create a cognitive framework to assist students self monitor their steps and progress towards goal attainment.

Another evidenced-based practice to increase opportunities for self-determination and to enhance students' overall levels of self-determination is to incorporate instructional strategies to promote component elements of self-determined behavior (Algozzine, Browder, Karvonen, Test, & Wood, 2001; Pierson, Carter, Lane, & Glaeser, 2008; Wehmeyer, Shogren, Zager, Smith, & Simpson, 2010). Examples of instructional strategies are providing opportunities on a regular

basis for choice making (Burton-Hoyle, 2011; Fullerton & Coyne, 1999; Shogren, Faggella-Luby, Bae, & Wehmeyer, 2004), purposefully teaching students impersonal problem solving and interpersonal or social problem-solving (Wehmeyer & Schalock, 2001), providing instructions in self-regulation and student-directed learning skills (Agran et al., 2005; Palmer, Wehmeyer, Gibson, & Agran, 2004).

REFERENCES

Abery, B. H., & Stancliffe, R. J. (1996). The ecology of self-determination. In D. J. Sands & M. L. Wehmeyer (Eds.), *Self-determination across the life span: Independence and choice for people with disabilities (pp. 111-145).* Baltimore: Paul H. Brookes.

Agran, M., Salzberg, C. L., & Stowitschek, J. J. (1987). An analysis of the effects of a social skills training program using self-instructions on the acquisition and generalization of two social behaviors in a work setting. *Journal of the Association for Persons with Severe Handicaps, 12*, 131-139.

Agran, M., Sinclair, T., Alper, S., Cavin, M., Wehmeyer, M. L., & Hughes, C. (2005). Using self-monitoring to increase following-direction skills of students with moderate to severe disabilities in general education. *Education and Training in Developmental Disabilities, 40*, 3-13.

Algozzine, B., Browder, D., Karvonen, M., Test, D.W., & Wood, W. (2001). Effects of interventions to promote self-determination for individuals with disabilities. *Review of Educational Research, 71*, 219 – 277.

American Psychiatric Association. (2000). *Diagnostic and Statistical Manual of Mental Disorders* (4th ed., text revision). Washington, DC: Author.

Bambara, L. M., & Gomez, O. N. (2001). Using a self-instructional training package to teach complex problem-solving skills to adults with moderate and severe disabilities. *Education and Training in Mental Retardation and Developmental Disabilities, 36*, 386-400.

Beaumont, R., & Sofronoff, K. (2008). A multi-component social skills intervention for children with AS: The junior detective training program. *Journal of Child Psychology and Psychiatry, 49*(7), 743-753.

Bellini, S. (2006). The development of social anxiety in adolescents with autism spectrum disorders. *Focus on Autism and Other Developmental Disabilities, 21,* 138-145.

Bellini, S., Peters, J. K., Benner, L., & Hopf, A. (2007). A meta-analysis of school-based social skills interventions for children with autism spectrum disorders. *Remedial and Special Education, 28*(3), 153-162.

Bentler, P. M. (1990). Comparative fit indexes in structural models. *Psychological Bulletin, 107,* 238–246.

Bollen, K. A. (1989). *Structural equations with latent variables*. New York, NY: Wiley.

Brinckerhoff, L. C., McGuire, J. M., & Shaw, S. F. (2002). Postsecondary education and transition for students with learning disabilities. Austin, TX: PRO-ED.

Brown, T. A. (2006). *Confirmatory factor analysis for applied research*. New York, NY: Guilford Press.

Browne, M. W. & Cudeck, R. (1993). Alternative ways of assessing model fit. In K. A. Bollen & J. S. Long (Eds.) *Testing Structural Equation Models* (pp. 136–162). Beverly Hills, CA: Sage.

Burton-Hoyle, S. (2011). Autism spectrum disorders: Strategies toward a self-determined life for your child. *Exceptional Parent, 41,* 26 – 27.

Carnahan, C. R., Hume, K., Clarke, L., & Borders, C. (2009). Using structured work systems to promote independence and engagement for students with autism spectrum disorders. *Teaching Exceptional Children, 41*, 6-14.

Carter, E. W., Lane, K. L., Pierson, M., R., & Glaeser, B. (2006). Self-determination skills and opportunities of transition-age youth with emotional disturbance and learning disabilities. *Council for Exceptional Children, 72*(3*),* 333-346.

Chadsey-Rusch, J., Rusch, F., & O'Reilly, M. F. (1991). Transition from school to integrated communities. *Remedial and Special Education, 12*, 23-33.

Clark, E., Olympia, D. E., Jensen, J., Heathfield, L. T., & Jenson, W. R. (2004). Striving for autonomy in contingency-governed world: Another challenge for individuals with developmental disabilities. *Psychology in the Schools, 41*(1), 143-153.

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*, 108-114.

D'Agostino, R. B., Jr. (1998). Propensity score methods for bias reduction in the comparison of a treatment to a non-randomized control group. *Statistics in Medicine, 17*, 2265–2281.

Faherty, C. (2000). *What does it mean to me? A workbook explaining self-awareness and life lessons to the child or youth with high functioning autism or aspergers*. Arlington, TX: Future Horizons.

Ferretti, R. P. (1989). Problem solving and strategy production in mentally retarded persons. *Research in Developmental Disabilities, 10*, 19-39.

Field, S. (1996). Self-determination instructional strategies for youth with learning disabilities. *Journal of Learning Disabilities, 29*(1), 40-52.

Field, S., & Hoffman, A. (1994). Development of a model for self-determination. *Career Development for Exceptional Individuals, 17*, 159-169.

Field, S., & Hoffman, A. (1999). The importance of family involvement for promoting self-determination in adolescents with autism and other developmental disabilities. *Focus on Autism and Other Developmental Disabilities, 14*(1), 36-41.

Field, S., Martin, J., Miller, R., Ward, M. J., & Wehmeyer, M. L. (1998). A practical guide for

teaching self-determination. Reston, VA: Council for Exceptional Children, Division on Career Development Transition.

Field, S., Sarver, M. D., & Shaw, S. F. (2003). Self-determination: A key to success in postsecondary education for students with learning disabilities. *Remedial and Special Education, 24*(6), 339-349.

Fullerton, A. (1994). *Putting feet on my dreams: A program in self-determination*. Portland, OR: Portland State University.

Fullerton, A. (1998). Putting feet on my dreams: Involving students with autism in life planning. In M. L. Wehmeyer & D. J. Sands (Eds.), *Making it happen: Student involvement in education planning, decision making, and instruction* (pp. 279-296). Baltimore: Brookes.

Fullerton, A., & Coyne, P. (1999). Developing skills and concepts for self-determination in young adults with autism. *Focus on Autism and Other Developmental Disabilities, 14*(1), 42-52.

Grigal, M., Neubert, D. A., Moon, M. S., & Graham, S. (2003). Self-determination for students with disabilities: Views of parents and teachers. *Council for Exceptional Children, 70,* 97-112.

Guo, A., & Fraser, M.K. (2010). *Propensity score analysis: Statistical methods and applications*. London, UK: Sage Publications, Inc.

Hagner, D., Kurtz, A., Cloutier, H. Arakelian, C., Brucker, D. L., & May, J. (2012). Outcomes of a family-centered transition process for students with autism spectrum disorders. *Focus on Autism and Other Developmental Disabilities, 27,* 42-50.

Hart, D., Grigal, M., & Weir, C. (2010). Expanding the paradigm: Postsecondary education options for individuals with autism spectrum disorder and intellectual disabilities. *Focus*

on Autism and Other Developmental Disabilities, 25, 134-150.

Hendricks, D., & Wehman, P. (2009). Transition from school to adulthood for youth with autism spectrum disorders: Review and recommendations. *Focus on Autism and Other Developmental Disabilities, 24*, 77–88.

Hu, L. T., & Bentler, P. M. (1999). Cutoff criteria for fit indexes in covariance structure analysis: Conventional criteria versus new alternatives. *Structural Equation Modeling, 6,* 1–55.

Krasny, L., Williams, B. J., Provencal, S., & Ozonoff, S. (2003). Social skills interventions for the autism spectrum: Essential ingredients and a model curriculum. *Child and Adolescent Psychiatric Clinics of North America, 12*, 107–122.

Lachapelle, Y., Wehmeyer, M. L., Haelewyck, M. C., Courbois, Y., Keith, K. D., Schalock, R., Verdugo, M. A., & Walsh P. N. (2005). The relationship between quality of life and self-determination: an international study. *Journal of Intellectual Disability Research, 49,* 740-744.

Lane, K. L., Carter, E. W., Pierson, M., & Glaeser, B. (2006). Academic, social, and behavioral profiles of high school students with emotional disturbance and learning disabilities. *Journal of Emotional and Behavioral Disabilities*, *14,* 108-117.

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,* 91-107.

Lee, S. H., Wehmeyer, M. L., Palmer, S. B., Williams-Diehm, K., Davies, D., & Stock, S. (2010). Examining individual and instruction-related predictors of the self-determination of students with disabilities: Multiple regression analyses. *Remedial and Special Education, 31*(6), 1-12.

Lee, S. H., Wehmeyer, M. L., Soukup, J. H., & Palmer, S. B. (2010). Impact of curriculum modifications on access to the general education curriculum for students with disabilities. *Exceptional Children, 76*(2), 213-233.

Little, T. D., Lindenberger, U., & Nesselroade, J. R. (1999). On selecting indicators for multivariate measurement and modeling with latent variables: When "good" indicators are bad and "bad" indicators are good. *Psychological Methods, 4*, 192-211.

Malian, I., & Nevin, A. (2002). A review of self-determination literature: Implications for practitioners. *Remedial and Special Education, 23*, 68-74.

MacCallum, R. C., Browne, M. W., & Sugawara, H. M. (1996). Power analysis and determination of sample size for covariance structure modeling. *Psychological Methods, 1*, 130–149.

McConnell, S. R. (2002). Interventions to facilitate social interaction for young children with autism: Review of available research and recommendations for educational intervention and future research. *Journal of Autism and Developmental Disorders, 32,* 351–372.

Martin, J. E., Marshall, L. H. (1995). ChoiceMaker: A comprehensive self-determination transition program. *Intervention in School and Clinic, 30*, 147-156.

Martin, J. E., Mithaug, D. E., Cox, P., Peterson, L. Y., Van Dycke, J. L., & Cash, M. E. (2003). Increasing self-determination: Teaching students to plan, work, evaluate, and adjust. *Exceptional Children, 69*, 431-447.

Martin, J. E., Van Dycke, J. L., Greene, B. A., Gardner, J. E., Christense, W. R., Woods, L. L., et al. (2006). Direct observation of teacher-directed IEP meeting: Establishing the need for student IEP meeting instruction. *Exceptional Children, 72,* 187-200.

Martorell, A., Gutierrez-Recacha, P., Pereda, A., & Ayuso-Mateos, J. L. (2008). Identification of

personal factors that determine work outcome for adults with intellectual disability. *Journal of Intellectual Disability Research, 52*, 1091-1101.

McConnell, S. R. (2002). Interventions to facilitate social interaction for young children with autism: Review of available research and recommendations for educational intervention and future research. *Journal of Autism and Developmental Disorders, 32*, 351–372.

Meadan, H., & Monda-Amaya, L. (2008). Collaboration to promote social competence for students with mild disabilities in the general classroom: A structure for providing support. *Intervention in School and Clinic, 43*, 158-167.

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.

Mukaddes, N. M., Hergüner, S., & Tanidir, C. (2010). Psychiatric disorders in individuals with high-functioning autism and Asperger's disorder: Similarities and differences. *The World Journal of Biological Psychiatry, 11*, 964–971.

Mundy, P., & Burnette, C. (2005). Joint attention and neurodevelopmental models of autism. In Volkmar, F. (Ed.), *Handbook of autism and pervasive developmental disorders* (pp. 650-681). Hoboken, NJ: John Wiley.

Muthén, B. & Muthén, L. (1998–2010). *Mplus User's Guide.* Los Angeles, CA: Muthén & Muthén.

Nirje, B. (1972). The right to self-determination. In W. Wolfensberger (Ed.), *Normalization* (pp. 176 – 193). Toronto: National Institute on Mental Retardation.

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.

Palmer, S. B., Wehmeyer, M. L., Gibson, K., & Agran, M. (2004). Promoting access to the general curriculum by teaching self-determination skills. *Exceptioanl Children, 70(4),* 427-439.

Palmer, S. B., Wehmeyer, M. L., Shogren, K. A., Williams-Diehm, K., & Soukup, J. (2012). An evaluation of the Beyond Hischool Model on the self-determination of students with intellectual disability. *Career Development for Exceptional Individuals, 46*, 195-210.

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.

Powers, L. E., Geenen, S., Powers, J., Pommier-Satya, S., Turner, A., Dalton, L., …Swand, P. (2012). My life: Effects of a longitudinal, randomized study of selfdetermination enhancement on the transtiotion outcomes of youth in foster care and special education. *Children and Youth Services Review, 34*, 2179-2187.

Powers, L. E., Wilson, R., Matuszewski, J., Phillips, A., Rein, C., Schumacher, D., & Gensert, J. (1996). Facilitating adolescent self-determination: What does it take? In D.J. Sands & M.L. Wehmeyer (Eds.), *Self-determination across the life span: Independence and choice for people with disabilities* (pp. 257 - 284). Baltimore: Paul H. Brookes.

Rosenbaum, P. R., & Rubin, D. B. (1983). The central role of the propensity score in observational studies for causal effects. *Biometrika, 70*(1), 41–55.

Sansosti, F. J., & Powell-Smith, K.A. (2008). Using computer-presented social stories and video models to increase the social communication skills of children with high-functioning autism spectrum disorders. *Journal of Positive Behavior Intervention, 10*(3), 162-177.

Sarver, M. D. (2000). *A study of the relationship between personal and environmental factors bearing on self-determination and the academic success of university students with learning disabilities.* Unpublished doctoral dissertation, University of Florida, Gainesville.

Seo, H., Wehmeyer, M., Palmer, S., Soukup, J., Williams-Diehm, K., & Shogren, K. (2012). Examining individual and environmental factors on levels of self-determination of students with disabilities: The relationship between self-determination and disability categories, gender, and educational setting. *The Journal of Special Education: Theory and Practice, 13,* 1-22.

Shogren, K., Faggella-Luby, M., 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,* 228-237.

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,* 37-52.

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,* 320-330.

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,* 488-509.

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 Institutes for Research Self-Determination Scale. *Assessment for Effective Intervention, 33*, 94-107.

Skrtic, T. M. (Ed.). (1995). *Disability and democracy: Reconstructing (special) education for postmodernity*. New York: Teachers College Press.

Stancliffe, R. J., Abery, B. H., & Smith, J. (2000). Personal control and the ecology of community living settings: Beyond living-unit size and type. *American Journal on Mental Retardation, 105*(6), 431-454.

Stancliffe, R. J., Abery, B. H., Springborg, H., & Elkin, S. (2000). Substitute decision-making and personal control: Implications for self-determination. *Mental Retardation, 38*(5), 407-421.

Stancliffe, R. J., & Wehmeyer, M. L. (1995). Variability in the availability of choice to adults with mental retardation. *Journal of Vocational Rehabilitation, 5*, 319-328.

Steiger, J. H., & Lind, J. C. (1980). *Statistically based tests for the number of common factors.* Paper presented at the annual Spring Meeting of the Psychometric Society, Iowa City, IA.

Tager-Flusberg, H., Paul, R., & Lord, C. (2005). Language and communication in autism. In F. Volkmar, R. Paul, A. Klin, & D. J. Cohen (Eds.), Handbook of autism and pervasive developmental disorders (3rd ed., pp. 335–364). New York: Wiley.

Test, D. W., Karvonen, M., Wood, W. M., Browder, D., & Algozzine, B., (2000). Choosing a self-determination curriculum: Plan for the future. *Teaching Exceptional Children, 33*, 48-54.

Test, D. W., Mason, C., Hughes, C., Konrad, M., Neale, M., & Wood, W. M. (2004). Student involvement in individualized education program meetings. *Council for Exceptional*

Children, 70(4), 391-412.

Test, D. W., Mazzotti, V. L., Mustian, A. L., Fowler, C. H., Kottering, L., & Kohler, P. (2009). Evidence-based secondary transition predictors for improving postschool outcomes for students with disabilities. *Career Development for Exceptional Individuals, 32*, 160-181.

Thede, L. L., & Coolidge, F. L. (2007). Psychological and neurobehavioral comparisons of children with Asperger's disorder versus high-functioning autism. *Journal of Autism and Developmental Disorders, 37*, 847–854.

Trainor, A. (2005). Self-determination perceptions and behaviors of diverse students with LD during the transition planning process. *Journal of Learning Disabilities, 38,* 233-249.

Tucker, L. R., & Lewis, C. (1973). A reliability coefficient for maximum likelihood factor analysis. *Psychometrika, 38,* 1–10.

Uberti, H. Z., Mastopieri, M., & Scruggs, T. (2004). Check it off: Individualizing a math algorithm for students with disabilities via self-monitoring checklist. *Intervention in School and Clinic, 39,* 269-275.

Wanger, M., Marder, C., Blackorby, J., Cameto, R., Newman, L., Levine, P., et al. (2003). *The achievements of youth with disabilities during secondary school*. Menlo Park, CA: SRI International.

Ward, M. J. (1988). The many facets of self-determination. *Transition Summary, 5,* 2-3.

Ward, M.J. (1989). *The many facets of self-determination*. NICHCY Transition Summary, 5, 2-3.

Ward, M. J. (1996). Coming of age in the age of self-determination: A historical and personal perspective. In D.J. Sands & M.L. Wehmeyer (Eds.), *Self-determination across the life span: Independence and choice for people with disabilities* (pp. 3 – 16). Baltimore: Paul H. Brookes.

Ward, M. J., & Kohler, P. D. (1996). Teaching self-determination: Content and process. In L.E. Powers, G.H.S. Singer, & J. Sowers (Eds.), *On the road to autonomy: Promoting self-competence in children and youth with disabilities* (pp. 275 – 290). Baltimore: Paul H. Brookes.

Ward, M. J., & Meyer, R. N. (1999). Self-determination for people with developmental disabilities and autism: Two self-advocates' perspectives. *Focus on Autism and Other Developmental Disabilities, 14*(3), 133-139.

White, S. W., & Roberson-Nay, R. (2009). Anxiety, social deficits, and loneliness in youth with autism spectrum disorders. *Journal of Autism and Developmental Disorders, 39,* 1006-1013.

Williams-Diehm, K., Wehmeyer, M.L., Palmer, S., Soukup, J.H., & Garner, N. (2008). Self-determination and student involvement in transition planning: A multivariate analysis. *Journal on Developmental Disabilities, 14,* 25-36.

Wehmeyer, M. L. (1994). Perceptions of self-determination and psychological empowerment of adolescents with mental retardation. *Education and Training in Mental Retardation and Developmental Disability, 29,* 9-21.

Wehmeyer, M. L. (1996). A self-report measure of self-determination for adolescents with cognitive disabilities. *Education and Training in Mental Retardation and Developmental Disabilities, 31,* 282-293.

Wehmeyer, M. L. (1997). Self-determination as an educational outcome: A definitional framework and implications for intervention. *Journal of Developmental and Physical Disabilities, 9,* 175-209.

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.

Wehmeyer, M. L. (2006). Self-determination and individuals with severe disabilities: Re-examining meanings and misinterpretations. *Research and Practice for Persons with Severe Disabilities, 30*(3), 113-120.

Wehmeyer, M. L. (2003). A functional theory of self-determination: Model overview. In M. L. Wehmeyer, B. Abery, D. E. Mithaug, & R. Stancliffe (Eds.) *Theory in self-determination: Foundations for educational practice*. Springfield, IL: C.C. Thomas.

Wehmeyer, M. L., Abery, B., Mithaug, D., & Stancliffe, R. (2003). *Theory in self-determination: Foundations for educational practice*. Springfield, IL: C.C. Thomas.

Wehmeyer, M. L., Abery, B. H., Zhang, D., Ward, K., Willis, D., et al. (2011). Personal self-determination and moderating variables that impact efforts to promote self-determination. Exceptionality. *A Special Education Journal, 19*, 19-30.

Wehmeyer, M. L., Agran, M., & Hughes, C. (2000). A national survey of teachers' promotion of self-determination and student-directed learning. *The Journal of Special Education, 34*, 58-68.

Wehmeyer, M. L., Agran, M., Hughes, C., Martin, J., Mithaug, D. E., & Palmer, S. (2007). *Promoting self-determination in students with intellectual and developmental disabilities*. New York: Guilfor Press.

Wehmeyer, M. L., Bersani, H., & Gagne, R. (2000). Riding the third wave: Self-determination and self-advocacy in the 21st Century. In M. Wehmeyer & J. Patton (Eds.), *Mental Retardation in the 21st Century* (pp. 315 – 333). Austin, TX: ProEd.

Wehmeyer, M. L., & Field, S. (2007). *Self-determination: Instructional and Assessment Strategies*. Thousand Oaks, CA: Corwin Press.

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.

Wehmeyer, M. L., Garner, N., Lawrence, M., Yeager, D., & Davis, A. K. (2006). Infusing self-determination into 18–21 services for students with intellectual or developmental disabilities: A multi-stage, multiple component model. *Education and Training in Developmental Disabilities, 41*, 3-13.

Wehmeyer, M. L., Gragoudas, S., & Shogren, K. (2006). Self-determination, student involvement, and leadership development. In P. Wehman (Ed.), Life beyond the classroom transition strategies for young people with disabilities (pp. 41-69). Baltimore, MD: Paul H. Brookes Publishing Co.

Wehmeyer, M. L., & Kelchner, K. (1994). Interpersonal cognitive problem-solving skills of individuals with mental retardation. *Education and Training in Mental Retardation and Developmental Disabilities, 29*, 265-278.

Wehmeyer, M. L., & Kelchner, K. (1995a). Measuring the autonomy of adolescents and adults with mental retardation: A self-report form of the Autonomous Functioning Checklist. *Career Development for Exceptional Individuals, 18*, 3-20.

Wehmeyer, M. L., & Kelchner, K. (1995b). *The Arc's self-determination scale*. Arlington, TX: The Arc National Headquarters.

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, 632-642.

Wehmeyer, M., Lawrence, M., Kelchner, K., Palmer, S., Garner, N., & Soukup, J. (2004). *Whose Future Is It Anyway? A student-directed transition planning process (2nd ed.)*. Lawrence, KS: Beach Center on Disability.

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,* 131-144.

Wehmeyer, M. L., Palmer, S., Agran, M., Mithaug, D., & Martin, J. (2000). Promoting causal agency: The self-determined learning model of instruction. *Exceptional Children, 66,* 439-453.

Wehmeyer, M. L., Palmer, S. B., Lee, Y., Williams-Diehm, K., & Shogren, K. A. (2011). A randomized-trial evaluation of the effect of Whose Future Is It Anyway? on self-determination. *Career Development for Exceptional Individuals, 34,* 45-56.

Wehmeyer, M. L., Palmer, S. B., Shogren, K. A., Williams-Diehm, K., & Soukup, J. (2013). Establishing a causal relationship between interventions to promote self-determination enhanced student self-determination. *Journal of Special Education, 46,* 195-210.

Wehmeyer, M. L., & Schalock, R. (2001). Self-determination and quality of life: Implications for Special Education Services and Supports. *Focus on Exceptional Children, 33*(8), 1-16.

Wehmeyer, M. L., & Schwartz, M. (1997). Self-determination and positive adult outcomes: A follow-up study of youth with mental retardation or learning disabilities. *Exceptional Children, 63,* 245-255.

Wehmeyer, M. L., Shogren, K. A., Zager, D., Smith, T. E. C., & Simpson, R. (2010). Research-based principles and practices for educating students with autism: Self-determination and

social interactions. *Education and Training in Autism and Developmental Disabilities, 45*(4), 475-486.

Wehmeyer, M. L., Shogren, K. A., Palmer, S. B., Williams-Diehm, K., Little, T. D., & Boulton, A. (2012). The Impact of the Self-Determined Learning Model of Instruction on student self-determination. *Council for Exceptional Children, 78,* 135-153.

Wehmeyer, M. L., Shogren, K. A., Zager, D., Smith, T. E. C., & Simpson, R. (2010). Research-based principles and practices for educating students with autism: Self-determination and social interactions. *Education and Training in Autism and Developmental Disabilities, 45*(4), 475-486.

Wehmeyer, M. L., & Smith, T. E. C. (2011). Promoting self-determination and social inclusion: A review of research-based practices. In D. Zagar, M.L. Wehmeyer & R. Simpson (Eds.), *Educating students with autism: Evidence-based principles and practices*. New York: Taylor & Francis.

Whitney-Thomas, J., & Moloney, M. (2001). "Who I am and what I want": Adolescents' self-definition and struggles. *Exceptional Children, 67,* 375-389.

Williams-Diehm, K., Wehmeyer, M.L., Palmer, S., Soukup, J.H., & Garner, N. (2008). Self-determination and student involvement in transition planning: A multivariate analysis. *Journal on Developmental Disabilities, 14,* 25-36.

Wolman, J., Campeau, P., Dubois, P., Mithaug, D., & Stolarski, V. (1994). AIR Self-Determination Scale and user guide. Pola Alto, CA: American Institute for Research.

Zhang, D. (2001). Self-determination and inclusion: Are students with mild mental retardation more self-determined in regular classrooms? *Education and Training in Mental Retardation and Developmental Disabilities, 36,* 357-362.

Zhange, D., & Benz, M. R. (2006). Enhancing self-determination of culturally diverse students with disabilities: Current status and future directions. *Focus on Exceptional Children, 38*, 1-12.

Yianni-Coudurier, C., Darrou, C., Lenoir, P., Verrecchia, B., Assouline, B., et al. (2008). What clinical characteristics of children with autism influence their inclusion in regular classroom? *Journal of Mental Deficiency, 52*, 855-863.

APPENDICES

Appendix A: Parent/Guardian Consent Form

Approved by the Human Subjects Committee University of Kansas, Lawrence Campus (HSCL). Approval expires one year from 1/25/2011. HSCL # 16460

Autism and Self-Determination:
Measurement and Contrast with Other Disability Groups

The information below will tell you about this study so that you can decide if you would like your son or daughter to participate. Please get in touch with us at the contact information provided at the end of this form if you do not understand something or if you have a question about this paper.

Purpose of this Study

- We want to find out more about autism and self-determination. What are the factors that support improved self-determination for students with autism?
- Then, we want to compare the self-determination scores of students with autism with self-determination outcomes from students with two other disability labels to learn more about autism.

Procedures

- Your son or daughter will do 2 surveys about self-determination:
  1) The Arc's Self-Determination Scale and the AIR Self-Determination Scale. The Arc's SD Scale has 72 questions, involving students choosing an answer or giving responses to short-answer questions.

  A student does not need to be able to read to answer the questions – someone can read them to a student who does not choose to read them or needs help in reading the questions.

  2) The AIR Self-Determination Scale has 21 questions, involving students choosing an answer from "Never" to "Always do," and giving a short response to an open-ended question about their current goals.

- This study will also collect information about your son or daughter including name, grade, date of birth, education settings, attendance at IEP meeting, and special education support needs.

Risks

- There are no known risks for your son's or daughter's participation in this study.

Benefits

- The results of the study will provide important information that helps researchers and educators to develop and provide more opportunities and instructional supports for students with autism to become more self-determined.

Payment to Participants

- Your son or daughter will be provided a $5 gift card when he or she completes surveys for the study. Investigators may ask for his/her social security number in order to comply with federal and state tax and accounting regulations.

Ensuring confidentiality

- No one but research staff will access student information.
- All participants will be assigned a code number so that your son's or daughter's name will not be associated with the information collected.
- All paper copies of information collected for this project will be kept until the end of the study in the year 2012 and then destroyed.

Refusal to Sign Consent and Authorization

- Your son or daughter does not have to participate in this study, and this will not change any educational services he or she receives now or in the future.
- Please return this form letting us know whether or not your son or daughter will participate in this study. Check either "yes" to participate and sign, or check "no" to decline and provide your name so we know not to contact you again.

Participant Certification

- You can ask us any questions you have about this study.
- If you have any questions, please feel free to contact us:
  - Susan Palmer at (785) 864-0270 spalmer@ku.edu
  - Yu-Chi (Angel) Chou at (785) 864-2454 chouyuchi@gmail.com

If you have questions about your rights or that of your son or daughter as a research participant you many contact the Human Subjects Committee Lawrence Campus (HSCL) office at (785) 864-7429 or (785) 864-7385, write the Human Subjects Committee Lawrence Campus (HSCL), University of Kansas, 2385 Irving Hill Road, Lawrence, KS 66045-7568, or e-mail mdenning@ku.edu.

Approved by the Human Subjects Committee University of Kansas, Lawrence Campus (HSCL). Approval expires one year from 4/10/2010. HSCL #16460

Contact Information:

Susan Palmer, Ph.D. or
1200 Sunnyside Ave.
3136 Haworth Hall
Lawrence, KS 66045-7534
(785) 864-0270
spalmer@ku.edu

Yu-Chi (Angel) Chou
1200 Sunnyside Ave.
3136 Haworth Hall
Lawrence, KS 66045-7534
(785) 864-2454
chouyuchi@gmail.com

PLEASE KEEP THIS PART FOR YOUR RECORDS

You can tear off and return this page to the teacher who gave it to your son or daughter or send it to the Special Education Department at their school.

If you agree that your son or daughter can participate in this study, please sign immediately below:

_____Yes, my son or daughter _____ can participate.
(print name of your son or daughter)

_____ _____
Parent/Guardian's Signature Date

****
****

OR, if you don't want your son or daughter to participate, please mark No and put your name on this paper before returning it to the school, so people will not contact you again about participation in this study:

_____ No, at this time my son or daughter will not participate in this study.

_____
Parent/Guardian's Name

Questions? Please contact Susan Palmer, Beach Center University of Kansas, 1200 Sunnyside Ave, 3136 Haworth Hall, Lawrence, KS 66045-7534
e-mail, spalmer@ku.edu (785)864-0270

Appendix B: Teacher Consent Form

Approved by the Human Subjects Committee University of Kansas, Lawrence Campus (HSCL). Approval expires one year from 1/25/2011. HSCL # 16460

Autism and Self-Determination:
Measurement and Contrast with Other Disability Groups

This consent form requests teachers to participate in a study of Autism and Self-Determination. The University of Kansas supports the practice of protection for human subjects participating in research. The following information is provided for you to decide whether you wish you to participate in the present study. You should be aware that even if you agree to participate, you are free to withdraw at any time. If you do withdraw from this study, it will not affect your relationship with your school, your employment, or the University of Kansas.

Purpose of this Study
This study will investigate the factors that support the understanding of self-determination for students with autism as well as compare the self-determination outcomes of students with autism with self-determination outcomes from students with two other disabilities labels: intellectual disability and learning disabilities.

Procedures
If you consent to participate, research staff will assist you to identify possible students who might be participants in the study. You will be asked to facilitate consent through a parent or guardian from students who are potential participants. If a family indicates their son or daughter will participate, you will be asked to help students complete two surveys and to provide some brief descriptive information about this student.

Risks
No risks are associated with participating in the study beyond any potential risk to confidentiality. Procedures to guard against that risk are discussed in a subsequent section.

Benefits
Your facilitation of survey administration will enhance the field's knowledge about self-determination and autism as well as provide important information that helps researchers to develop instructional supports for students with autism to become more self-determined.

Payments to Participants
Each teacher who participates in the study will receive the instructional materials of *Whose Future Is It Anyway*? (a CD version of a curriculum to help students implement decision making and goal setting for the future) to thank you for assistance for the study.

Information to Be Collected
Data on self-determination will be collected from each student participant using two self-report measures of self- determination: The Arc's Self-Determination Scale and the AIR Self-Determination Scale. You will be given some simple directions to help students complete the assessments, if needed. You will also be asked to provide descriptive information about your

students including name, grade, date of birth, education settings, attendance at IEP meeting, and special education support needs.

Ensuring confidentiality
All personally identifiable information (e.g., names of students, names of teachers, school names, etc.) will be replaced by a code. Data entered for analysis will include code numbers, so no names will be entered into a database at any time. Original survey forms, with all personally-identifiable information, will be retained by the researchers in a locked file cabinet in the research office. Completed, signed informed consents will be stored in a separate, locked file cabinet. All analyses will report only group data and will not identify individuals, school names or geographic areas, other than in the broadest terms (e.g., located in the Central or Eastern US).

Refusal to Sign Consent and Authorization
You are not required to sign this consent form and you may refuse to do so without affecting your right to any services you are receiving or may receive from the University of Kansas or in your own school district. However, if you do not sign, your information or that of your students cannot be included.

Canceling This Consent
You may withdraw your consent to participate in this study at any time by sending your written request to: Susan Palmer, Ph.D., Beach Center 1200 Sunnyside, 3136 Haworth Hall, Lawrence, KS 66045-7534.

Participant Certification
I have read this Consent and Authorization form. I have had the opportunity to ask, and I have received answers to, any questions I had regarding the study and the use and disclosure of information about me or my students for the study. I understand that if I have any additional questions about my rights as a research participant, I may call (785) 864-7429 or write the Human Subjects Committee Lawrence Campus (HSCL), University of Kansas, 2385 Irving Hill Road, Lawrence, Kansas 66045-7563 or mdenning@ku.edu.

I agree to participate in the study, collect survey assessments and descriptive information. By my signature I affirm that I have received a copy of this Consent and Authorization form.

We would be happy to answer any questions about this study.
Contact Information:

Susan Palmer, Ph.D. or
1200 Sunnyside Ave.
3136 Haworth Hall
Lawrence, KS 66045-7534
(785) 864-0270
spalmer@ku.edu

Yu-Chi (Angel) Chou
1200 Sunnyside Ave.
3136 Haworth Hall
Lawrence, KS 66045-7534
(785) 864-2454
chouyuchi@gmail.com

By signing below, you agree to participate in the study on Autism and Self-Determination.

_____Yes, _____ will participate.
(print your name)

_____ _____
Your Signature Date

****

OR, if you don't want to participate,

_____ No, at this time I will not participate in this study.

_____
Your Name

Approved by the Human Subjects Committee University of Kansas, Lawrence Campus (HSCL). Approval expires one year from 4/10/2010. HSCL #16460

Questions? Please contact Susan Palmer, Beach Center University of Kansas, 1200 Sunnyside Ave, 3136 Haworth Hall, Lawrence, KS 66045-7534
e-mail, spalmer@ku.edu (785)864-0270

Appendix C: Student Information Form

Autism and Self-Determination: Measurement and Contrast with Other Disability Groups

STUDENT INFORMATION

1. Student name (or ID number if known): _____
2. Date of birth: _____
3. Gender: Male__ Female__
4. Person Completing Form: _____ Relationship with student: _____
   Date: _____ Phone/email _____
5. Race (check all that apply):
   _____ American Indian or Alaskan Native
   _____ Asian or Pacific Islander
   _____ Black or African American
   _____ White / Non-Hispanic / Non-Latino
   _____ White / Hispanic / Latino
   Other (specify) _____
6. Ethnicity:
   Is student Hispanic or Latino? Yes _____ No _____
7. Primary language of student: English__ Other (specify)_____
8. Nature of student's PRIMARY disability (<u>check only one</u>)
   _____ ADD or ADHD _____ Autism spectrum disorder
   _____ Emotional or Behavioral disorder _____ Specific learning disability
   _____ Hearing Impairment including Deafness _____ Physical disability
   _____ Mental retardation _____ Traumatic brain injury
   _____ Speech or language impairment _____ Vision impairment including Blindness
   _____ Other health impairment (specify): _____
   _____ Other disability (specify): _____
9. . Nature of student's SECONDARY disability (<u>check all that apply</u>)
   _____ ADD or ADHD _____ Autism spectrum disorder
   _____ Emotional or Behavioral disorder _____ Specific learning disability
   _____ Hearing Impairment including Deafness _____ Physical disability
   _____ Mental retardation _____ Traumatic brain injury
   _____ Speech or language impairment _____ Vision impairment including Blindness
   _____ Other health impairment (specify): _____
   _____ Other disability (specify): _____

10. Is there a behavior plan in student's current IEP? Yes _____ No _____

11. How many hours per day is the student under your direct supervision this year? (if your school uses block scheduling, please average hours to generate a per-day answer)
    Less than 1 ___ Between 1 & 3 ___ Between 3 & 5 ___ Full Day ___
    Student not seen daily (please specify) _____

12. Typical educational setting for student *this year*: General Education ___ Resource room ___
    Self-contained setting ___ Community-Based services ___, or other (specify): _____

13. How many hours does the student spend during day with non-disabled peers:
    0__ Less than 1__ Between 1 & 3__ Between 3 & 5__ Full Day__

14. Is this student included in *any* class with general education peers? _____yes ____no
    If yes, which ones?_____

15. Please indicate student's approximate level of intelligence:
    _____ IQ within normal limits (70 and above) _____ Mild mental retardation (IQ 60-69)
    _____Moderate mental retardation (IQ 45-60) _____ Severe/Profound (IQ 44 and below)

16. Was student present at their last IEP meeting? Yes ___ No ___

17. If student attended their IEP, what was the level of this student's involvement in their IEP?
    _____ Student just attended, did not speak
    _____ Somewhat active, spoke up in some way
    _____ Very active, took a role in planning and carrying out the meeting
    _____ Extremely active, lead own meeting

18. Check each item if you know this student has received curriculum/instructions in any of the following areas? (Check all that apply)
    ____ Personal management or self-help skills
    ____ Speech/language/communication skills
    ____ Social skills
    ____ Leisure, and recreation skills
    ____ Vocational skills
    ____ Organizational skills (i.e., managing school materials, color coding study notes, using planner)
    ____ Others: _____

19. Does this student receive any of the following accommodations or modifications to their instruction? (Please check all that apply)

    a) Paraprofessional support ____ b) Extended time on tests _____

    c) Extended time on assignments _____ d) Reduced assignments _____

    e) Assistive technology devices_____ f) Use of calculator for math _____

    g) Concrete aids for math or other subject _____ h) A reader for testing____

    i) Adjusted reading demands _____ k) Preferred seating _____

    l) Hearing or vision support _____ m) Scribe or notetaker _____

    n) Peer support _____ o) Audio books _____

    p) Handwriting modifications (using computer, answering orally, etc.) _____

    q) Quiet time/place for test/work completion_____

    r) Homework planner (due dates, amount of time spending, instructions) _____

20. Does the student use any of the following assistive technology devices to support socialization?

    ____ Social stories

    ____ Visual schedules

    ____ Graphic organizers (i.e., mapping webs, Venn diagrams, timelines)

    ____ Feelings charts, posters, and books

    ____ Cue cards (i.e., steps of problem solving, classroom rules card)

    ____ Computer access

    ____ Augmentative and alternative communication (i.e., communication boards, signs, speech-generating devices, electronic devices, etc.)

    ____ First-Then boards

    ____ Positioning or mobility

    ____ Others: please specify which one(s): _____

21. Please briefly describe the overall level of independence of the student at school?

    _____

    _____

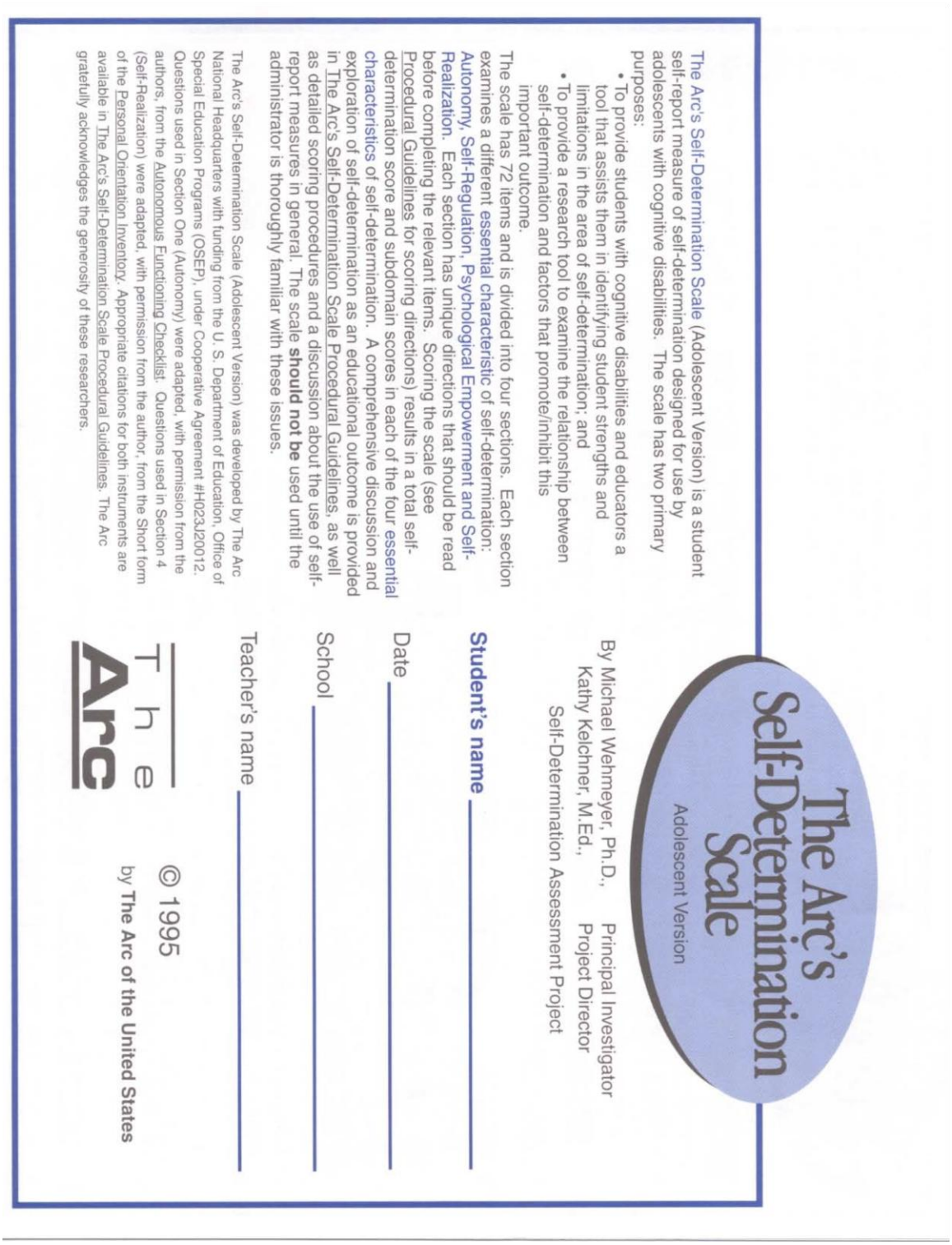
22. Would you please briefly describe the student's general attitude towards the accommodations or assistance he/she receives at school? Does the student value or avoid using them?

    _____

    _____

Thank you very much for your time in completing this information! KU Study Team

Appendix D: The Arc's Self-Determination Scale



The Arc's Self-Determination Scale

Adolescent Version

By Michael Wehmeyer, Ph.D., Principal Investigator
Kathy Kelchner, M.Ed., Project Director
Self-Determination Assessment Project

The Arc's Self-Determination Scale (Adolescent Version) is a student self-report measure of self-determination designed for use by adolescents with cognitive disabilities. The scale has two primary purposes:

- To provide students with cognitive disabilities and educators a tool that assists them in identifying student strengths and limitations in the area of self-determination; and
- To provide a research tool to examine the relationship between self-determination and factors that promote/inhibit this important outcome.

The scale has 72 items and is divided into four sections. Each section examines a different essential characteristic of self-determination: Autonomy, Self-Regulation, Psychological Empowerment and Self-Realization. Each section has unique directions that should be read before completing the relevant items. Scoring the scale (see Procedural Guidelines for scoring directions) results in a total self-determination score and subdomain scores in each of the four essential characteristics of self-determination. A comprehensive discussion and exploration of self-determination as an educational outcome is provided in The Arc's Self-Determination Scale Procedural Guidelines, as well as detailed scoring procedures and a discussion about the use of self-report measures in general. The scale **should not be** used until the administrator is thoroughly familiar with these issues.

Student's name _____

Date _____

School _____

Teacher's name _____

The Arc's Self-Determination Scale (Adolescent Version) was developed by The Arc National Headquarters with funding from the U. S. Department of Education, Office of Special Education Programs (OSEP), under Cooperative Agreement #H023J20012. Questions used in Section One (Autonomy) were adapted, with permission from the authors, from the Autonomous Functioning Checklist. Questions used in Section 4 (Self-Realization) were adapted, with permission from the author, from the Short form of the Personal Orientation Inventory. Appropriate citations for both instruments are available in The Arc's Self-Determination Scale Procedural Guidelines. The Arc gratefully acknowledges the generosity of these researchers.

Section One
Autonomy

Directions:

Check the answer on each question that BEST tells how you act in that situation. There are no right or wrong answers. Check only one answer for each question. (If your disability limits you from actually performing the activity, but you have control over the activity (such as a personal care attendant), answer like you performed the activity.)

1A. Independence: Routine personal care and family oriented functions

1A. Subtotal _____

1. I make my own meals or snacks.	☐ I do not even if I have the chance	☐ I do sometimes when I have the chance	☐ I do most of the time I have the chance	☐ I do every time I have the chance
2. I care for my own clothes.	☐ I do not even if I have the chance	☐ I do sometimes when I have the chance	☐ I do most of the time I have the chance	☐ I do every time I have the chance
3. I do chores in my home.	☐ I do not even if I have the chance	☐ I do sometimes when I have the chance	☐ I do most of the time I have the chance	☐ I do every time I have the chance
4. I keep my own personal items together.	☐ I do not even if I have the chance	☐ I do sometimes when I have the chance	☐ I do most of the time I have the chance	☐ I do every time I have the chance
5. I do simple first aid or medical care for myself.	☐ I do not even if I have the chance	☐ I do sometimes when I have the chance	☐ I do most of the time I have the chance	☐ I do every time I have the chance
6. I keep good personal care and grooming.	☐ I do not even if I have the chance	☐ I do sometimes when I have the chance	☐ I do most of the time I have the chance	☐ I do every time I have the chance

1B. Independence: Interaction with the environment

1B. Subtotal _____

7. I make friends with other kids my age.	☐ I do not even if I have the chance	☐ I do sometimes when I have the chance	☐ I do most of the time I have the chance	☐ I do every time I have the chance
8. I use the post office.	☐ I do not even if I have the chance	☐ I do sometimes when I have the chance	☐ I do most of the time I have the chance	☐ I do every time I have the chance
9. I keep my appointments and meetings.	☐ I do not even if I have the chance	☐ I do sometimes when I have the chance	☐ I do most of the time I have the chance	☐ I do every time I have the chance
10. I deal with salespeople at stores and restaurants.	☐ I do not even if I have the chance	☐ I do sometimes when I have the chance	☐ I do most of the time I have the chance	☐ I do every time I have the chance

1C. Acting on the basis of preferences, beliefs, interests and abilities: Recreational and leisure time

1C. Subtotal _____

11. I do free time activities based on my interests.	☐ I do not even if I have the chance	☐ I do sometimes when I have the chance	☐ I do most of the time I have the chance	☐ I do every time I have the chance
12. I plan weekend activities that I like to do.	☐ I do not even if I have the chance	☐ I do sometimes when I have the chance	☐ I do most of the time I have the chance	☐ I do every time I have the chance
13. I am involved in school-related activities.	☐ I do not even if I have the chance	☐ I do sometimes when I have the chance	☐ I do most of the time I have the chance	☐ I do every time I have the chance
14. My friends and I choose activities that we want to do.	☐ I do not even if I have the chance	☐ I do sometimes when I have the chance	☐ I do most of the time I have the chance	☐ I do every time I have the chance
15. I write letters, notes or talk on the phone to friends and family.	☐ I do not even if I have the chance	☐ I do sometimes when I have the chance	☐ I do most of the time I have the chance	☐ I do every time I have the chance
16. I listen to music that I like.	☐ I do not even if I have the chance	☐ I do sometimes when I have the chance	☐ I do most of the time I have the chance	☐ I do every time I have the chance

1D. Acting on the basis of preferences, beliefs, interests and abilities: Community involvement and interaction

1D. Subtotal _____

	I do not even if I have the chance	I do sometimes when I have the chance	I do most of the time I have the chance	I do every time I have the chance
17. I volunteer in things that I am interested in.	☐	☐	☐	☐
18. I go to restaurants that I like.	☐	☐	☐	☐
19. I go to movies, concerts, and dances.	☐	☐	☐	☐
20. I go shopping or spend time at shopping centers or malls.	☐	☐	☐	☐
21. I take part in youth groups (like 4-H, scouting, church groups)	☐	☐	☐	☐

1E. Acting on the basis of preferences, beliefs, interests and abilities: Post-school directions

1E. Subtotal _____

	I do not even if I have the chance	I do sometimes when I have the chance	I do most of the time I have the chance	I do every time I have the chance
22. I do school and free time activities based on my career interests.	☐	☐	☐	☐
23. I work on school work that will improve my career chances.	☐	☐	☐	☐
24. I make long-range career plans.	☐	☐	☐	☐
25. I work or have worked to earn money.	☐	☐	☐	☐
26. I am in or have been in career or job classes or training.	☐	☐	☐	☐
27. I have looked into job interests by visiting work sites or talking to people in that job.	☐	☐	☐	☐

1F. Acting on the basis of preferences, beliefs, interests and abilities: Personal expression

1F. Subtotal _____

	I do not even if I have the chance	I do sometimes when I have the chance	I do most of the time I have the chance	I do every time I have the chance
28. I choose my clothes and the personal items I use every day.	☐	☐	☐	☐
29. I choose my own hair style.	☐	☐	☐	☐
30. I choose gifts to give to family and friends.	☐	☐	☐	☐
31. I decorate my own room.	☐	☐	☐	☐
32. I choose how to spend my personal money.	☐	☐	☐	☐

Please check Section One, A thru F, to make sure there is only one answer for each question.

Section Two
Self-Regulation

Directions:

Each of the following questions tell the beginning of a story and how the story ends. Your job is to tell what happened in the middle of the story, to connect the beginning and the end. Read the beginning and ending for each question, then fill in the BEST answer for the middle of the story. There are no right or wrong answers.

Remember, fill in the one answer that you think BEST completes the story.

2A. Interpersonal cognitive problem-solving

33. **Beginning:** You are sitting in a planning meeting with your parents and teachers. You want to take a class where you can learn to work as a cashier in a store. Your parents want you to take the Family and Child Care class. You can only take one of the classes.

Middle: _____

_____

_____

_____

_____

Ending: The story ends with you taking a vocational class where you will learn to be a cashier.

Story Score _____

34. **Beginning:** You hear a friend talking about a new job opening at the local book store. You love books and want a job. You decide you would like to work at the bookstore.

Middle: _____

_____

_____

_____

_____

Ending: The story ends with you working at the bookstore.

Story Score _____

35. **Beginning:** Your friends are acting like they are mad at you. You are upset about this.

Middle: _____

_____

_____

_____

_____

Ending: The story ends with you and your friends getting along just fine.

Story Score _____

36. **Beginning:** You go to your English class one morning and discover your English book is not in your backpack. You are upset because you need that book to do your homework.

Middle: _____

_____

_____

_____

_____

Ending: The story ends with you using your English book for homework.

Story Score _____

37. **Beginning:** You are in a club at school. The club advisor announces that the club members will need to elect new officers at the next meeting. You want to be the president of the club.

Middle: _____

_____

_____

_____

_____

_____

_____

_____

Ending: The story ends with you being elected as the club president.

Story Score _____

38. **Beginning:** You are at a new school and you don't know anyone. You want to have friends.

Middle: _____

_____

_____

_____

_____

_____

_____

_____

Ending: The story ends with you having many friends at the new school.

Story Score _____

2A Subtotal _____

2B: Goal setting and task performance

Directions:

The next three questions ask about your plans for the future. Again, there are no right or wrong answers. For each question, tell if you have made plans for that outcome and, if so, what those plans are and how to meet them.

39. Where do you want to live after you graduate?

☐ I have not planned for that yet.

☐ I want to live_____

List four things you should do to meet this goal:

1) _____
2) _____
3) _____
4) _____

40. Where do you want to work after you graduate?

☐ I have not planned for that yet.

☐ I want to work_____

List four things you should do to meet this goal:

1) _____
2) _____
3) _____
4) _____

41. What type of transportation do you plan to use after graduation?

☐ I have not planned for that yet.

☐ I plan to use_____

List four things you should do to meet this goal:

1) _____
2) _____
3) _____
4) _____

2B Subtotal _____

Section Three
Psychological Empowerment

Directions:

Check the answer that BEST describes you.

Choose only one answer for each question.

There are no right or wrong answers.

42. ☐ I usually do what my friends want... or
☐ I tell my friends if they are doing something I don't want to do.

43. ☐ I tell others when I have new or different ideas or opinions... or
☐ I usually agree with other peoples' opinions or ideas.

44. ☐ I usually agree with people when they tell me I can't do something... or
☐ I tell people when I think I can do something that they tell me I can't.

45. ☐ I tell people when they have hurt my feelings... or
☐ I am afraid to tell people when they have hurt my feelings.

46. ☐ I can make my own decisions... or
☐ Other people make decisions for me.

47. ☐ Trying hard at school doesn't do me much good... or
☐ Trying hard at school will help me get a good job.

48. ☐ I can get what I want by working hard... or
☐ I need good luck to get what I want.

49. ☐ It is no use to keep trying because that won't change things... or
☐ I keep trying even after I get something wrong.

50. ☐ I have the ability to do the job I want... or
☐ I cannot do what it takes to do the job I want.

51. ☐ I don't know how to make friends... or
☐ I know how to make friends.

52. ☐ I am able to work with others... or
☐ I cannot work well with others.

53. ☐ I do not make good choices... or
☐ I can make good choices.

54. ☐ If I have the ability, I will be able to get the job I want... or
☐ I probably will not get the job I want even if I have the ability.

55. ☐ I will have a hard time making new friends... or
☐ I will be able to make friends in new situations.

56. ☐ I will be able to work with others if I need to... or
☐ I will not be able to work with others if I need to.

57. ☐ My choices will not be honored... or
☐ I will be able to make choices that are important to me.

Section 3 Subtotal _____

Section Four
Self-Realization

Directions:
Tell whether you think each of these statements describes how you feel about yourself or not. There are no right or wrong answers. Choose only the answer that BEST fits you.

58. I do not feel ashamed of any of my emotions.	☐ Agree	☐ Don't agree	66. I don't accept my own limitations.	☐ Agree	☐ Don't agree
59. I feel free to be angry at people I care for.	☐ Agree	☐ Don't agree	67. I feel I cannot do many things.	☐ Agree	☐ Don't agree
60. I can show my feelings even when people might see me.	☐ Agree	☐ Don't agree	68. I like myself.	☐ Agree	☐ Don't agree
61. I can like people even if I don't agree with them.	☐ Agree	☐ Don't agree	69. I am not an important person.	☐ Agree	☐ Don't agree
62. I am afraid of doing things wrong.	☐ Agree	☐ Don't agree	70. I know how to make up for my limitations.	☐ Agree	☐ Don't agree
63. It is better to be yourself than to be popular.	☐ Agree	☐ Don't agree	71. Other people like me.	☐ Agree	☐ Don't agree
64. I am loved because I give love.	☐ Agree	☐ Don't agree	72. I am confident in my abilities.	☐ Agree	☐ Don't agree
65. I know what I do best.	☐ Agree	☐ Don't agree			

Section 4 Subtotal _____

Scoring Step 1:

Record the raw scores from each section:

Autonomy

1A = ☐
1B = ☐
1C = ☐
1D = ☐
1E = ☐
1F = ☐

Domain Total: ☐

Self-Regulation

2A = ☐
2B = ☐

Domain Total: ☐

Psychological Empowerment

3 = ☐

Domain Total: ☐

Self-Realization

4 = ☐

Domain Total: ☐

Scoring Step 2:

Sum each Domain Total for a Total Score:

Self-Determination Total = ☐

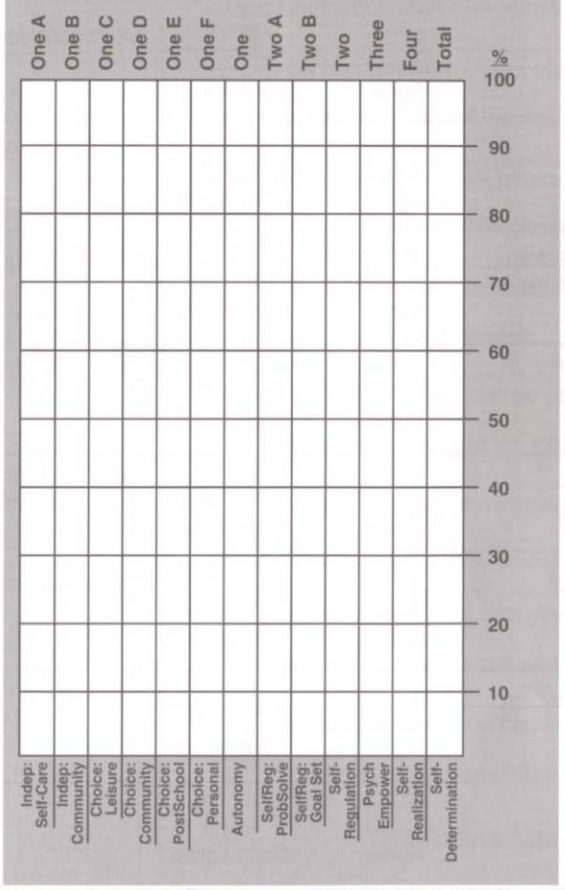
Scoring Step 3:

Using the conversion tables in Appendix A, convert raw scores into percentile scores for comparison with the sample norms (Norm Sample) and the percentage of positive responses (Positive Scores):

	Norm Sample	Positive Scores
Autonomy		
1A =	☐	☐
1B =	☐	☐
1C =	☐	☐
1D =	☐	☐
1E =	☐	☐
1F =	☐	☐
Domain Total:	☐	☐
Self-Regulation		
2A =	☐	☐
2B =	☐	☐
Domain Total:	☐	☐
Psychological Empowerment		
3 =	☐	☐
Domain Total:	☐	☐
Self-Realization		
4 =	☐	☐
Domain Total:	☐	☐
Self-Determination Total Score =	☐	☐

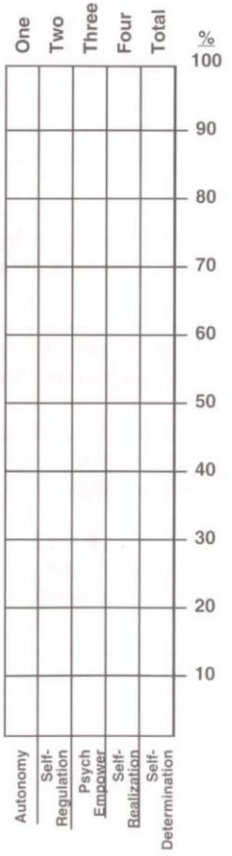
Scoring Step 4:

Fill in the graph for the percentile scores from the norming sample. From the appropriate percentile down, darken the complete bar graph (See example in Scoring Manual):



Scoring Step 5:

Fill in the graph for the percentile scores indicating the percent positive responses.



Appendix E: AIR Self-Determination Scale

THINGS I DO

1. I know what I need, what I like, and what I'm good at.	Never ☐ 1	Almost Never ☐ 2	Sometimes ☐ 3	Almost Always ☐ 4	Always ☐ 5
2. I set goals to get what I want or need. I think about what I am good at when I do this.	Never ☐ 1	Almost Never ☐ 2	Sometimes ☐ 3	Almost Always ☐ 4	Always ☐ 5
			Things I Do – Total Items 1 + 2		
3. I figure out how to meet my goals. I make plans and decide what I should do.	Never ☐ 1	Almost Never ☐ 2	Sometimes ☐ 3	Almost Always ☐ 4	Always ☐ 5
4. I begin working on my plans to meet my goals as soon as possible.	Never ☐ 1	Almost Never ☐ 2	Sometimes ☐ 3	Almost Always ☐ 4	Always ☐ 5
			Things I Do – Total Items 3 + 4		
5. I check how I'm doing when I'm working on my plan. If I need to, I ask others what they think of how I'm doing.	Never ☐ 1	Almost Never ☐ 2	Sometimes ☐ 3	Almost Always ☐ 4	Always ☐ 5
6. If my plan doesn't work, I try another one to meet my goals.	Never ☐ 1	Almost Never ☐ 2	Sometimes ☐ 3	Almost Always ☐ 4	Always ☐ 5
			Things I Do – Total Items 5 + 6		

Please go on to the next page ⇒

HOW I FEEL

1. I feel good about what I like, what I want, and what I need to do.	Never □ 1	Almost Never □ 2	Sometimes □ 3	Almost Always □ 4	Always □ 5
2. I believe that I can set goals to get what I want.	Never □ 1	Almost Never □ 2	Sometimes □ 3	Almost Always □ 4	Always □ 5
			How I Feel – Total Items 1 + 2		
3. I like to make plans to meet my goals.	Never □ 1	Almost Never □ 2	Sometimes □ 3	Almost Always □ 4	Always □ 5
4. I like to begin working on my plans right away.	Never □ 1	Almost Never □ 2	Sometimes □ 3	Almost Always □ 4	Always □ 5
			How I Feel – Total Items 3 + 4		
5. I like to check on how well I'm doing in meeting my goals.	Never □ 1	Almost Never □ 2	Sometimes □ 3	Almost Always □ 4	Always □ 5
6. I am willing to try another way if it helps me to meet my goals.	Never □ 1	Almost Never □ 2	Sometimes □ 3	Almost Always □ 4	Always □ 5
			How I Feel – Total Items 5 + 6		

Please go on to the next page ⇒

WHAT HAPPENS AT SCHOOL

1. People at school listen to me when I talk about what I want, what I need, or what I'm good at.	Never ☐ 1	Almost Never ☐ 2	Sometimes ☐ 3	Almost Always ☐ 4	Always ☐ 5
2. People at school let me know that I can set my own goals to get what I want or need.	Never ☐ 1	Almost Never ☐ 2	Sometimes ☐ 3	Almost Always ☐ 4	Always ☐ 5
				What Happens at School – Total Items 1 + 2	
3. At school, I have learned how to make plans to meet my goals and to feel good about them.	Never ☐ 1	Almost Never ☐ 2	Sometimes ☐ 3	Almost Always ☐ 4	Always ☐ 5
4. People at school encourage me to start working on my plans right away.	Never ☐ 1	Almost Never ☐ 2	Sometimes ☐ 3	Almost Always ☐ 4	Always ☐ 5
				What Happens at School – Total Items 3 + 4	
5. I have someone at school who can tell me if I am meeting my goals.	Never ☐ 1	Almost Never ☐ 2	Sometimes ☐ 3	Almost Always ☐ 4	Always ☐ 5
6. People at school understand when I have to change my plan to meet my goals. They offer advice and encourage me when I'm doing this.	Never ☐ 1	Almost Never ☐ 2	Sometimes ☐ 3	Almost Always ☐ 4	Always ☐ 5
				What Happens at School – Total Items 5 + 6	

Please go on to the next page ⇒

WHAT HAPPENS AT HOME

1. People at home listen to me when I talk about what I want, what I need, or what I'm good at.	Never ☐ 1	Almost Never ☐ 2	Sometimes ☐ 3	Almost Always ☐ 4	Always ☐ 5
2. People at home let me know that I can set my own goals to get what I want or need.	Never ☐ 1	Almost Never ☐ 2	Sometimes ☐ 3	Almost Always ☐ 4	Always ☐ 5
				What Happens at Home – Total Items 1 + 2	
3. At home, I have learned how to make plans to meet my goals and to feel good about them.	Never ☐ 1	Almost Never ☐ 2	Sometimes ☐ 3	Almost Always ☐ 4	Always ☐ 5
4. People at home encourage me to start working on my plans right away.	Never ☐ 1	Almost Never ☐ 2	Sometimes ☐ 3	Almost Always ☐ 4	Always ☐ 5
				What Happens at Home – Total Items 3 + 4	
5. I have someone at home who can tell me if I am meeting my goals.	Never ☐ 1	Almost Never ☐ 2	Sometimes ☐ 3	Almost Always ☐ 4	Always ☐ 5
6. People at home understand when I have to change my plan to meet my goals. They offer advice and encourage me when I'm doing this.	Never ☐ 1	Almost Never ☐ 2	Sometimes ☐ 3	Almost Always ☐ 4	Always ☐ 5
				What Happens at Home – Total Items 5 + 6	

Please go on to the next page ⇒

PLEASE WRITE YOUR ANWERS TO THE FOLLOWING QUESTIONS…

Give an example of a goal you are working on.

_____

_____

_____

_____

_____

What are you doing to reach this goal?

_____

_____

_____

_____

_____

How well are you doing in reaching this goal?

_____

_____

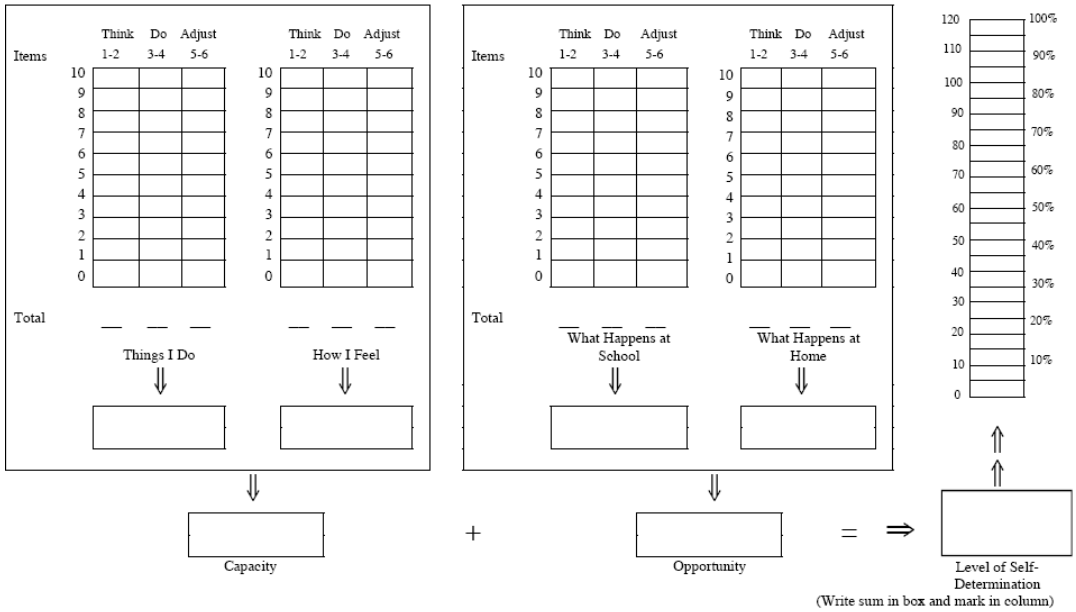
_____

_____

_____

THANK YOU!

The AIR Self-Determination Profile
Student Form



Name_____ Date_____