ASSESSING AND PREDICTING SOCIAL EMOTIONAL LEARNING

COMPETENCIES IN STUDENTS WITH

AUTISM SPECTRUM DISORDER

by

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Dedication

I would like to dedicate this dissertation to my husband, David. You are the reason I am able to go after my dreams and you make me the best version of myself. I would have never made it this far in life without your love and support. Thank you for not letting me quit. I would also like to dedicate this to my parents and sister who never gave up on me, and who pushed me to always work hard and never give up on myself. Dad, I hope you are proud.

Finally, this dissertation is my love letter to my daughter Reese. I hope this serves as proof that you should always follow your dreams and always remain true to yourself along the way. You are all of my hopes and dreams and everything I do is for you.

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Finally, I would like to thank the autism community. Thank you for always showing me that there is hope and that life can always be sweet in hard moments. Most importantly, thank you for giving me a purpose in life.

ABSTRACT

ASSESSING AND PREDICTING SOCIAL EMOTIONAL LEARNING

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University of Houston-Clear Lake, 2022

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Social emotional learning skills, or SEL, is a burgeoning area of study which includes areas such as responsible decision making, self-awareness, social awareness, self-management, and relationship skills which are essential in order to successfully navigate the world. These SEL skills are likely delayed for individuals with Autism Spectrum Disorders (ASD). Some of the hallmarks that individuals with ASD often face are deficits in the acquisition of social and emotional skills and awareness of these skills in others. Given that individuals with ASD struggle within these areas, this project sought to investigate a narrowed focus into the development of SEL skills, specifically, by looking at how factors such as IQ, gender, ethnicity, and SES influence skill development. This paper posed two questions: 1.) What are the typical SEL competencies exhibited by individuals (aged 3-21) with ASD? 2.) To what extent does intellectual functioning (e.g., Full Scale IQ) influence the overall SEL competency of an individual with ASD (when considering individual factors of SES, gender, race/ethnicity)? For the first question, data

was collected from a previous study which included SELSI parent ratings of neurotypical children. This data was then used to compare to new data collected from this study where caregivers completed the SELSI for their children with ASD. The two groups were compared on the parent reported SELSI using group means. When comparing the two groups among individuals aged 6-11, it was found that neurotypical individuals were rated higher across all areas. For the second question, hierarchical linear regressions were used to examine whether individual factors impacted SEL competencies. The first step in the models included individual variables of gender, race/ethnicity, and SES. The second step in the models added IQ to determine the additional variance predicted above that of the demographic variables. Results of the models indicated that individual variables were not significant predictors of SEL; however, IQ was a significant predictor of SEL skills in preschool and child samples only. The results of this project suggest SEL skills lag in development for individuals with ASD compared to their neurotypical peers and may be important to consider in educational assessment and intervention planning.

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INTRODUCTION

Autism

Autism Spectrum Disorder (ASD) is a neurodevelopmental disorder which commonly manifests within childhood. It impacts all races, ethnicities, and socioeconomic statuses. It also impacts both males and females; however, males are four times more likely to receive a diagnosis than females (Baio et al., 2018). Within recent history, prevalence rates have risen from 1 in 88 children in 2012 to 1 in 54 children in 2018 (Maenner et al., 2020). ASD occurs along a *spectrum,* exemplified by a wide range of symptoms which may or may not manifest within each individual. The term spectrum also covers the various levels of functioning with which many individuals may or may not present. Diagnostically, ASD is characterized by two defining hallmarks: 1) deficits in social interactions and communication problems, and 2) restricted, repetitive patterns of behavior, interests, or activities (American Psychiatric Association, 2013).

Social communication deficits include deficits in social-emotional reciprocity, lack of consistent non-verbal communicative behavior, and deficiencies in maintaining and understanding social relationships (Lord et al., 2018). Gaps in social-emotional reciprocity may include difficulties such as a failure to initiate conversations with others, a lack of back and forth exchange during conversation, and an overall reduced quality of social interactions with others (e.g., conversations lacking quality content such as shared enjoyment or interests or appropriate affect displayed towards the other individual). Difficulties in non-verbal communication behavior might include: a lack of integration between verbal and non-verbal communication (e.g., smiling when someone is crying), a lack of or fleeting eye contact during conversation, inappropriate expressions of body language (e.g., facial expressions), and difficulty understanding the use of gestures (e.g.,

someone extending their hand to shake hands). Finally, difficulties experienced within social relationships might include difficulties meeting the behavioral expectations of the social context (e.g., whispering in a library), difficulty utilizing imaginative play, and difficulties forming friendships (Lord et al., 2018).

The second diagnostic marker, specific restricted, repetitive patterns of behavior, interests, or activities, can include an array of behaviors such as stereotyped or repetitive motor movements, use of objects, or speech and inflexibility and rigidity with insistence on sameness, inflexible adherence to routines, ritualized patterns of verbal and non-verbal behavior, highly fixated interests that are abnormal in focus and intensity, and hyporeactivity or hyperreactivity to environmental sensory input (Lord et al., 2018). Stereotyped or repetitive motor movements, use of objects, or speech might present as motor stereotypies (e.g., hand flapping or finger twisting), lining up items (e.g., lining up cars and toys), and spinning objects (e.g., spinning the wheels on a toy car). Insistence on things remaining the same, inflexible adherence to routines, or ritualized patterns of verbal and non-verbal behavior may manifest as displays of extreme distress over routine or simple changes (e.g., changing the route driven to school), difficulty transitioning during daily routines or activities (e.g., switching teachers at daycare) or inflexible thought patterns (e.g., thinking the expression "a piece of cake" literally means a piece of cake is present). Highly restricted, fixated interests that are abnormal in intensity and focus would include a strong interest in unusual objects (e.g., ceiling fans; Boyd et al., 2009). Hyporeactivity and hyperreactivity to sensory input in the environment may present as a high pain tolerance (or even indifference) or adverse responses to sound or textures (e.g., screaming while someone is singing happy birthday) (Lord et al., 2018).

The symptoms associated with ASD often manifest early within a child's life and diagnostic criteria require that symptoms must be present during the developmental

period of life. In addition, said symptoms must cause significant impairment, and must not be explained by any other known causes, such as intellectual disability; however, the two can occur co-morbidly (Matson et al., 1996).

The Cost of ASD

Individuals with ASD often present with social and emotional difficulties which remain throughout their lifespans. Given that autism is considered within a spectrum of functioning, the vast majority of individuals diagnosed will likely require some type of lifelong support (Lord et al., 2018). Similar to individual capabilities, individual supports needed may vary from person to person. While some individuals may eventually be able to obtain some type of independence, others may require vast amounts of costly support. As individuals with ASD transition from adolescence to adulthood, supports may start to dwindle and barriers to service may emerge (Cheak-Zamora et al., 2014; Rast et al., 2018). For example, only 1 in 5 youth with ASD receive health care transition services (Cheak-Zamora et al., 2014; Rast et al., 2018) which are necessary for helping them to manage their healthcare needs as they transition into adulthood. As such, the cost of treatment for individuals with ASD and their families can serve as a financial burden and barrier, especially given that costs will extend across the individual's lifespan. On average, the United States spends $35 billion per year on ASD with a lifetime per-capita societal cost of $3.2 million (Ganz, 2007). Given that this is the case, it is important to understand the capacities of individuals with ASD so that appropriate treatment and goals can be developed to ameliorate such costs across the individuals' lifespan.

Autism and Cognitive/Intellectual Functioning

When considering the impact of ASD for an individual, cognitive, or intellectual functioning, is a key domain. Intellectual capacity draws upon many skill areas. More broadly, intelligence is referred to as the overall general mental capacity that involves the

cognitive skill areas of reasoning, planning, solving problems, thinking abstractly, comprehending complex ideas, learning efficiently, and learning from experience (Vannest, 2013). Intellectual impairment refers to individuals with an intelligence quotient of below 70 (as shown from formal intellectual assessments) and impairments in adaptive functioning (Boat et al., 2015). Impairments in adaptive functioning refer to difficulties in carrying out daily tasks and activities which involve "self-help" skills and practicing independence. Examples of these skills include dressing oneself, preparing meals, coordinating activities for the day, etc. Also, within the category of adaptive skills are social skills and how individuals are able to manage interactions with others. Those with deficits in both intellectual and adaptive functioning struggle to carry out such activities.

When considering individuals with ASD, it is always important to consider intellectual capacity, given that roughly one-third of individuals with ASD also have accompanying intellectual impairment with significant challenges in their daily functioning (Christensen et al., 2018). Furthermore, an additional 24% of individuals present with intellectual impairment within the borderline range (Christensen et al., 2018). Intact intellectual capacity can serve as a protective factor in individuals with ASD concerning long-term outcomes. Longitudinal studies have found that cognitive ability serves as a prognostic indicator of adulthood outcomes in individuals with ASD (Eaves & Ho, 2008; Farley et al., 2009; Lord & Bailey, 2002). Additionally, intellectual capacity acted as a potential moderator in children with ASD, as children with higher IQ scores displayed higher scores on measures of adaptive/appropriate social skills, and lower on measures of adaptive/appropriate social skills (Tureck & Matson, 2012). This has also been found to be the case for neurotypical individuals as well. For example one study which examined intellectual capacity and social skills in both children with ASD and

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neurotypical samples found that lower cognitive ability contributed to lower social skills in both neurotypical and ASD samples (Itskovich et al., 2021). Given that this is the case, it stands to reason that intellectual capacity in individuals with ASD would likely impact social-emotional learning capacities and manifesting skills.

As stated earlier, ASD occurs on a spectrum, thus the capabilities of one individual vary from another and intelligence is no exception. Often times when considering individuals with ASD, terms such as "high functioning" or "low functioning" are given to provide an overview of the individual's cognitive profile (Bal et al., 2017); however, such terms may negate individual strengths (Bal et al., 2016). While "high functioning" and "low functioning" ASD may focus specifically on cognitive intelligence, constructs such as "emotional intelligence" may be overlooked. Emotional intelligence serves a different function from cognitive intelligence and is distinguished by what is known as an emotional quotient (EQ) (Bar-On, 1997). Emotional intelligence includes the ability to perceive accurately, appraise and express emotion, the ability to access or generate feelings when they facilitate thought, the ability to understand emotion and emotional knowledge, and the ability to regulate emotions to prompt emotional and intellectual growth (Mayer & Salovey, 1997). This concept becomes important when considering an individual with ASD as they may be considered to be a "high functioning" individual within the sense of their cognitive intelligence, but "low functioning" when considering their emotional intelligence. For example, Boily et al. (2017) found emotional intelligence to be lower in cognitively high-functioning adolescents with ASD when compared to their neurotypical peers. Emotional intelligence is, therefore, a key factor to consider among individuals with ASD, and SEL can serve as an important vehicle for improvement of an EQ (Elksnin, & Elksnin, 2003).

Autism and Social-Emotional Functioning

As illustrated by the diagnostic criteria, many social and emotional impairments are likely to exist in an individual with ASD. Such impairments make it difficult for individuals with ASD to sometimes understand and execute typical, expected social and adaptive behaviors. For example, individuals with ASD find it difficult to comprehend the emotional experiences of others or "put themselves in others' shoes." This often requires an individual to engage in perspective taking which is often a struggle for individuals with ASD. Individuals with ASD may also lack basic social cognition (Bishop-Fitzpatrick et al., 2017) which makes it difficult for them to understand social situations, expectations, and norms. Additionally, Huang et al. (2017) found that individuals with ASD demonstrated difficulties in processing the emotions expressed by others in pain, but did not struggle to understand their own emotional experiences of their pain. Social cognition includes more than perspective taking and emotional processing. It also includes complex higher level functions such as "theory of mind" which is often required to engage with the social world. Theory of mind refers to the ability to be able to understand that our own thoughts, beliefs, and emotion states differ from others and are separate entities. Theory of mind is often the foundational skill which results in effective emotion processing and perspective taking and serves as one of the main contributors to social information processing or social cognition (Mazza et al., 2017). Thus, individuals who struggle with theory of mind will struggle in all of the skills within social cognition. Individuals with ASD have been shown to demonstrate impairments within theory of mind and resulting social cognition abilities (Mazza et al., 2017).

In addition, difficulties with social pragmatics often arise for individuals with ASD. How we communicate with one another within a social context is what is known as social communication or social pragmatics. This specific skill set often proves to be a

particularly difficult skill for individuals with ASD to build. The ability to combine both language and social skills can serve as a unique challenge and hallmark for individuals with ASD (Hale & Tager-Flusberg, 2005) and can make tasks such as social reciprocity difficult for both individuals with ASD and those with whom they communicate. Finally, individuals with ASD often present with restricted and repetitive behaviors that make social exchanges particularly challenging. Behaviors such as "stemming," sensory aversions, preoccupations, and inflexibility can isolate individuals with ASD and interfere with social development (Boyd et al., 2010). This serves as a barrier for many individuals with ASD, as social development is an essential cornerstone when considering both cognitive and adaptive functioning.

All of these hallmark impairments make life for an individual with ASD difficult to navigate. As such, correctly understanding such difficulties becomes an important task in helping to guide future directions in ASD research.

Social and Emotional Learning

One of the skill areas that has yet to be explored in individuals with ASD, is the extent of their development of social and emotional learning (SEL) competencies. One way to conceptualize social and emotional competencies is from a framework of SEL. According to the Center for Academic, Social, and Emotional Learning (CASEL), Social-emotional learning (SEL) is defined as, "the processes through which children and adults acquire and effectively apply the knowledge, attitudes, and skills necessary to understand and manage emotions, set and achieve positive goals, feel and show empathy for others, establish and maintain positive relationships, and make responsible decisions" (CASEL, 2013).

SEL is comprised of five core competencies: Self-Awareness, Self-Management, Social Awareness, Relationship Skills, and Responsible Decision Making (CASEL,

2013). All of these skills work in conjunction and are essential for navigating social interactions and relationships. Social and emotional learning skills and competencies serve as critical competencies that help to produce capable individuals and future productive members of society.

Self-Management

According to CASEL (2013), self-management refers to "the ability to successfully regulate one's emotions, thoughts, and behaviors in different situations — effectively managing stress, controlling impulses, and motivating oneself. The ability to set and work toward personal and academic goals." This is often seen in an individual's everyday abilities within impulse control, stress management, self-discipline, self-motivation, goal setting, and organizational skills (CASEL, 2013). Self-management serves as a positive indicator of long-term success within a person's life which includes task performance, school and work success, popularity, mental health and adjustment, and good interpersonal relationships (Baumeister et al., 1994; Duckworth & Seligman, 2005; Mischel et al., 1988; Shoda et al., 1990; Tangney et al., 2004; Wolfe & Johnson, 1995). As such, an understanding of how to initiate and implement effective self-management is crucial to an individual managing the various tasks and functions across their daily life.

When understanding individuals with ASD and their difficulties with self-management, it is important to consider executive functioning. Executive functioning (Pribram, 1973) refers to "a set of neurocognitive processes that allow for the organization of behavior across time to attain future goals and thereby increase individual long-term welfare." Executive functioning can be thought of as how an individual organizes their thoughts, behaviors, and actions and practices self-control across all. Executive functioning becomes an important construct when understanding SEL, as

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certain executive functioning capabilities have been linked with SEL competency. For example, inattention and inhibition have been shown to link directly with SEL skills and predict social competence in both typically developing children and children with ASD (Berard et al., 2017).

This becomes particularly salient in individuals with ASD as they often struggle to manage tasks which require executive functioning. Executive functioning involves individuals practicing effective behavioral inhibition, flexibility, emotion regulation, planning, and problem-solving, all areas of difficulty for individuals with ASD. These executive function deficits may also relate to diagnostic features such as restrictive, repetitive patterns of behavior. A meta-analysis by Demetriou and colleagues (2017) examined executive functioning influence on specific performance tasks in individuals with ASD and found a "broad executive dysfunction in individuals with ASD that is relatively stable across development" meaning that such difficulties persist throughout the lifespan. This helps to provide a further explanation as to why individuals with ASD struggle with self-management—they lack the necessary pre-cursor executive functioning skills.

Given the impact of self-management skills on daily functioning for individuals with ASD, it is important to target such difficulties in treatment. Self-management strategies, in particular, have been associated with notable improvements within the core deficits of ASD (Southall & Gast, 2011). Further, Carr et al. (2014) examined self-management interventions in individuals with ASD and found that such interventions were effective for increasing both social and academic skills for all school-aged individuals with ASD of all ages and levels of ability. Further, Zeng et al. (2020) found that youth with ASD who had greater access to health care services had positive social-

emotional functioning and that better access to health care services was mediated by supporting individuals with ASD in self-management.

Relationship Skills

Relationship Skills are the ability to be able to "communicate clearly, listen well, cooperate with others, resist inappropriate social pressure, negotiate conflict constructively, and seek and offer help when needed" (CASEL, 2013). Relationship skills are necessary in effectively navigating the social world that all individuals find themselves in. The accumulation of positive relationship skills is particularly important for individuals with ASD as they are more likely to experience rejection from their peers (White et al., 2007). Further, individuals with better social interaction skills are more likely to display greater participation in social and recreational activities that help to build more social relationships (Orsmond et al., 2004).

Additionally, social relationships are important in that they help to instill a sense of belonging in individuals. A feeling of belonging in children can help build better long-term outcomes such as increased academic achievement, social connectedness, and positive relationships (Korpershoek et al., 2020). Conversely, a lack of belonging is linked with poorer outcomes such as low academic achievement (Spier et al., 2007) and higher rates of student dropout (Lee & Burkam, 2003). Children with disabilities who experience fewer school-related stressors and have built social networks report higher levels of school belonging, which predicts higher levels of self-efficacy and overall school satisfaction (McMahon et al., 2008). Higher levels of school belonging are important for all children, but more so in children with disabilities who face additional barriers which are absent for their peers. Individuals with ASD may be particularly vulnerable to experiencing feelings of being "left out" or not experiencing belonging and connectedness. This may be due in part to the diagnostic feature of persistent deficits in

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social communication and understanding social relationships. Bauminger et al. (2003) found that children with ASD understood the two separate concepts of social interactions and loneliness; however, they failed to link the association between the two. Children with ASD in this study could not understand how levels of social interactions may impact individual feelings of loneliness. This individual difference highlights the foundational impairment which exists within an individual with ASD's basic understanding of social relationships and why, overall, they may experience less connectedness than their neurotypical peers.

Oftentimes, relationship skills are built within how we communicate with one another. This challenge is often seen in how individuals with ASD carry on a conversation. Individuals with ASD may struggle to engage in the expected reciprocal back-and-forth flow of conversation (Tager-Flusberg & Anderson, 1991) and may also struggle to remain on topic and interested in what the speaker is saying. As one can imagine, this makes the likelihood that people will want to speak to individuals with ASD less, as conversations may prove to be quite taxing on the part of the other individual.

When examining the role of relationship skills, specifically within the context of SEL, children with mental health difficulties and typically developing children who were perceived to have higher levels of SEL skills were observed to have more positive social interactions (McKown et al., 2009). Thus, higher levels of SEL competencies, led to an increase in pro-social relationships, something of vital importance in building healthy peer relationships for individuals with ASD.

Responsible Decision Making

Responsible decision making, refers to an important skill that is key to becoming an independently functioning adult. According to CASEL (2013), responsible decision making refers to "the ability to make caring and constructive choices about personal

behavior and social interactions based across diverse situations. This includes the capacities to consider ethical standards and safety concerns, and to evaluate the benefits and consequences of various actions for personal, social, and collective well-being." Examples of responsible decision making include: identifying and solving problems, analyzing situations, evaluating, reflecting, and finally, acting in an ethical responsible manner (CASEL, 2013).

Responsible decision making has proven to be a particularly difficult skill set for individuals with ASD to master. When considering the diagnostic hallmark of restricted, repetitive patterns of behavior, an individual with ASD may exhibit inflexibility and insistence on sameness which may constrict their decision-making skills. One study which examined decision-making in adults with ASD found that adults with ASD experienced more difficulties in decision-making when compared to their neurotypical peers. Further, due to difficulties practicing effective decision making, these same adults with ASD were more likely to avoid making decisions (Luke et al., 2012). This could be due in part to one of the other diagnostic features of ASD, hyper- or hyporeactivity to sensory input. Due to their sensory differences, individuals with ASD may find it harder to engage with their environment in a way which is needed to participate fully in decision-making. One study found that the way individuals with ASD attend to and explore their surroundings directly impacts their ability to engage in decision making, which in turn sometimes resulted in poor decision-making on tasks (Mussey et al., 2015).

Social Awareness

Social Awareness refers to the ability to "understand the perspectives of others and empathize with them" (CASEL, 2013), meaning that one can identify and respond to the needs of others within their everyday social encounters and relationships. Individuals with ASD often highlight their lack of social-emotional reciprocity in their Social

Awareness of themselves and others. In order to practice full Social Awareness, one must have a full understanding of one's own beliefs and emotions but also the beliefs and emotions of others. Mazza et al. (2017) examined social information processing in children with ASD and found that children with ASD have an underdeveloped capacity to understand the beliefs and emotions of others. An inability to understand beliefs and emotions in others makes it difficult to practice awareness of social norms in everyday life. Underlying irregularities which exist within individuals with ASD may help to account for such differences. Research has found that genetic and neurological differences in individuals with ASD (Klinger & Renner, 2000) result in information processing deficits which may further account for social communication deficits (Black et al., 2009).

Self-Awareness

According to CASEL (2013), self-awareness includes "the ability to accurately recognize one's emotions and thoughts and their influence on behavior." As such, this also requires that individuals can accurately identify and label their own feelings (Denham & Brown, 2010). Lack of self-awareness directly relates to the diagnostic criteria which describe individuals with ASD's difficulty with understanding their own behavior and being able to modulate it accordingly to fit social situations. This core deficit often results in individuals with ASD not being able to accurately identify their own emotions, beliefs, and states. As a result, it then becomes difficult for individuals with ASD to understand how their emotions, beliefs, and states may impact others and situations (Happé, 2003). Extending further, this difficulty in expression of self-awareness may have a trickle effect and impact other areas of the individual's life and may cause a further breakdown in obtaining SEL competencies (such as their relationship skills, social awareness, and self-management) (CASEL, 2013).

Benefits of SEL

SEL has been shown to produce benefits which are expansive and include a range of long-term improvements. A meta-analysis that examined long-term outcomes of students enrolled in SEL programming demonstrated increased test scores, reduced aggression and emotional distress among students, increased helping behaviors in school, improved positive attitudes toward self and others, and improvement in student empathy (Durlak et al., 2011). In addition to immediate and long-term consequences seen within students, long-term outcomes have been noted within society as well. Belfield et al. (2015), found that students involved in SEL programming were less likely to be on a waitlist for public assistance housing, have any contact with the law or police officials before becoming an adult, and spend any time within a detention facility.

It is important to take note of the recent changes within our world with respect to the ongoing COVID-19 pandemic. As a result of increases in quarantine periods, virtual schooling, and caregivers spending more time spent with children, many are beginning to take note of the importance of children's mental health. Now, one potential means of addressing children's mental health from a systemic level could be by implementing a universal intervention such as SEL. A recent 2021 meta-analysis found that implementation of SEL was shown to impact children's mental health with a decrease in short-term anxiety and depression symptoms (Clark et al., 2021). Parents are starting to feel more and more that SEL is a key area that should be highlighted within their child's education and studies have shown that the higher children are rated on SEL measures, the more their parents and teachers report important skills such as self-regulation and the ability to engage in successful social interactions (McKown et al., 2009). Further, in light of the large-scale impacts on children and families as a result of COVID-19, 62% of parents now believe that SEL is not utilized enough within their child's education.

Comparatively, three years prior, only 55% of parents reported feeling this way. Further, 82% of parents report that it has become even more important as a direct result of the pandemic (Mcgraw Hill, 2021).

Finally, research has shown SEL curriculum over time has proven to be a cost-benefit approach with future potential savings. SEL programs return eleven dollars for every one dollar spent per student (Belfield et al., 2015). Given that the cost of treatment for individuals with ASD is astronomical across their lifespans, interventions such as SEL can be shown to provide a cost-benefit and can help individuals and families ameliorate such costs.

Individual Diversity and SEL

In thinking about the development of SEL skills and implementation of instruction, it is important to take inventory of individual variables which are present within students who are the recipients of an SEL framework. This is important as there may be intersections between individual diversity factors and treatment benefits which should be considered in delivery. For example, one important characteristic to understand is a student's racial or ethnic identity. One research study found that SEL programs specifically can help to facilitate positive racial identity in black and latino students (Rivas-Drake et al., 2020). This is important as a positive racial identity is positively associated with academic achievement and self-esteem in students (Witherspoon et al., 1997). In addition to race/ethnicity, gender is also an important variable to consider as some preliminary research has shown that gender may serve as a potential moderator in the acquisition of SEL skills. For example, Raimundo et al., (2013) found that SEL programs led to greater improvements in males with respect to their self-management, social skills, and aggression. Further, SES has been shown to impact social and emotional functioning. In examining children from low-income families in comparison to children

from high-income families, it was found that children from low-income families were found to demonstrate less social and emotional competence and decreased prosocial behaviors (Harrod & Scheer, 2005; Lichter et al., 2002). Given that all of these individual variables have been shown to impact social and emotional functioning on their own, it is really important to understand how they impact SEL development as well.

In consideration of individual diversity and SEL, it is also important to recognize the intersection of the two within ASD. While ASD is found within all races, ethnicities, genders, and socioeconomic statuses, there are significant disparities within the experiences of minority groups. For example, research has found that minoritized individuals with ASD (e.g., those who are disadvantaged due to race, ethnicity, culture, socioeconomic status, location, sex, or gender identity) have been shown to have poorer long-term outcomes resulting in increases in health disparities and potential decreases in life expectancy (Ennis-Cole et al., 2013; Magaña et al., 2013; Mandell et al., 2007). In consideration of race/ethnicity specifically, individuals from diverse racial/ethnic backgrounds have been shown to not only receive an ASD diagnosis later (Ennis-Cole et al., 2013) but also are more likely to have received another diagnosis before the correct diagnosis of ASD (Mandell et al., 2007) delaying early intervention and treatment. Further, while the majority of children diagnosed are male, historically females experience disparities within diagnosis and are more likely to be diagnosed later (due to culturally reinforced behaviors of masking and compensatory behaviors) (Wijngaarden-Cremers, et al., 2014). Finally, in consideration of variables such as SES, it is important to understand that access to treatment can present with stark contrasts between families with and without financial means. Further, individuals with ASD who are within the low SES income bracket have been consistently shown to experience increases in treatment disparities (Durkin et al., 2017).

While much of the research within SEL has provided evidence that SEL is an equitable intervention practice which can benefit students from all backgrounds (Taylor et al., 2017), little has been done to specifically investigate individual diversity factors which examine the intersection of student diversity and SEL (Jones et al., 2019). In order to address such gaps within SEL specifically, a research agenda has been proposed which defines a need for *transformative* SEL. Transformative SEL refers to SEL's potential to mitigate systemic inequities and combat inequitable practices within service delivery, specifically within the implementation of SEL (Jagers et al., 2019).

Autism and SEL

As discussed, SEL skills are important for all children; however, individuals with ASD are often left out of this consideration within school settings. Previous research has shown that individuals with ASD are often not provided targeted treatments which can help to meet their individual needs within school settings (Test et al., 2014). This presents a gap within utilization as many individuals with ASD would greatly benefit from goals related to SEL. Further, strengthening SEL skills would likely directly target many of the social and emotional challenges that individuals with ASD often present with. In addition, as SEL was developed primarily as a school-based intervention provided at no cost to families, providing such interventions to ASD groups would increase access to treatment and potentially provide early intervention services needed within this population. This could in turn help to address some of the massive costs that individuals and families with ASD experience in access treatments.

Given that the diagnostic features and core deficits of ASD create barriers for individuals with ASD to obtain SEL competencies, it becomes important that individuals with ASD are given extra supports to gain SEL competencies. In order to do so, an accurate assessment of SEL competencies with the ASD population is needed in order to

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1) obtain a baseline of SEL competencies and 2) accurately track and monitor the progress of SEL interventions in the treatment of ASD. By doing so, practitioners can help individuals gain SEL competencies which can have important long-term outcomes for individuals with ASD and will help lead to a more positive trajectory.

Purpose of the Current Study

While SEL skills are often assumed to be easily learned or "picked up" by an individual, the intellectual capacity required to obtain these skills should be considered. Intact intellectual capacity serves as a tool for acquiring SEL skills and research indicates a correlation between lower IQ and poorer social-emotional skills (McClelland et al., 2000). Given that individuals with lower intellectual capacities are at a disadvantage when it comes to developing strong social-emotional skills, it is of vital importance that these individuals spend more time gathering skills via social interactions. Conversely, higher intellectual capacities do not always lead to the development of SEL competencies. Capps et al. (1996) found that individuals with ASD with higher intellectual capacities and low perceived social competence reported elevated depression symptoms. Further, it has been shown that the more time individuals with intellectual disabilities engage in social activities, the higher their social capabilities were (Brooks et al., 2015). Therefore, we know that intellectual functioning does impact social and emotional functioning; however, that relationship is not well explained. An understanding of intellectual functioning with respect to SEL may help us to gain more insight into that relationship. Further, gaining such competencies can thereby be expected to help increase positive outcomes for individuals across all levels of intellectual capacities.

Children diagnosed with both ASD and lower intellectual capacities, are some of the most vulnerable individuals in terms of social-emotional functioning, and in greatest need for SEL-focused services. Children diagnosed with both intellectual disability and

ASD have been shown to display more severe social and cognitive impairments and more adaptive deficits which result in poorer long-term behavior difficulties (McCarthy et al., 2010; Njardvik et al., 1999). Given that this is the case, it is important to understand not only the combination of ASD and intellectual abilities on social-emotional skills, but also the threshold by which such identifying characteristics impacts the acquisition of SEL competencies.

In addition to examination of intelligence, it is also important to consider individual diversity factors given the disparities which are present among diverse groups. As transformative SEL has become an important tenet within the future of SEL development, it was vital that this study be inclusive of diverse experiences and characteristics of individuals with ASD. It is particularly important within the ASD population as we know that individuals with ASD from diverse backgrounds are more likely to experience disparities within their treatment (Mandell et al., 2007). Therefore, any future research which examines potential treatments and interventions within the ASD population must include individual variables to ensure treatment which is inclusive of all groups.

Typically, when assessing SEL competencies specifically in children, professionals will turn to specific social skills inventories. Some well-known inventories which exist are the Social Skills Improvement System-Social Emotional Learning edition (SSIS-SEL, Gresham & Elliott, 2017) and The Devereux Student Strengths Assessment (DESSA, LeBuffe et al., 2009). A problem with some of these pre-existing measures is that they are often lengthy and not well-built for large-scale utilization (Anthony et al., 2022) and often are meant primarily for educators. Recently, additional inventories have begun to emerge which have been shown to link to the CASEL framework and are meant to be applied across settings and stakeholders. One such inventory includes the Social

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Emotional Learning Skills Inventory (SELSI; Schanding, 2017). The SELSI was created to provide a comprehensive measure of SEL skills, aligned with the CASEL framework.

While each measure assists in giving accurate assessments of SEL competencies in children, none provide comprehensive clinical norms for individuals with ASD. Some normative data are available from the SSIS-SEL. Within this measure, the sample for individuals with ASD was small (N = 50) and included both teacher and parent ratings (Elliott & Gresham, 2013). Given that the prevalence of ASD diagnoses is increasing, it is important that the field meet individuals with ASD at their level of need, with respect to social and emotional functioning (which can be conceptualized within the framework of SEL). Few SEL instruments have been used to examine SEL competencies for individuals with ASD and limited data is currently available. There is a need to address this gap with better instruments to examine ASD and SEL functioning, with this study being one of the first to do so. Further, it is important that the information gathered in this area is representative of the variability we see within the ASD population with respect to individual differences (i.e., gender, race/ethnicity, SES, cognitive functioning) and whether or not these differences serve as contributing factors. Previous research investigating intellectual functioning and social skills indicates that higher intellectual functioning does not significantly predict acquiring social skills (Turek & Matson, 2012); however, this has not been closely examined with respect to specific constructs of SEL.

<center>**Research Questions and Hypotheses**</center>

Currently, a gap exists within the literature on ASD, such that no SEL measure has provided clinical norms for individuals with ASD while accounting for intellectual functioning and individual differences. Therefore, this study seeks to address the following questions:

1. What are the typical SEL competencies exhibited by children and adolescents (ages 3-21) with ASD?

2. To what extent does intellectual functioning (e.g., Full-Scale IQ) influence the overall SEL competency of an individual with ASD (when considering gender, race/ethnicity, and SES)?

It is the hypothesis of this research study, that 1) SEL competencies in ASD populations are less developed than their and neurotypical peers and that children with ASD will demonstrate lower ratings of parent-rating SEL competencies 2) intellectual functioning may impact the acquisition of SEL competencies (i.e., higher intellectual functioning may help to facilitate the development of SEL). It is our hypothesis, that higher intellectual functioning will lead to higher SEL competencies. Further, we also hypothesize that children from neurotypical samples will exhibit higher levels of SEL competency than their ASD peers when rated by their caregivers.

CHAPTER II:

METHODOLOGY

Participant Sample

Participants for this study included parents of school-aged students with an Autism Spectrum Disorder between the ages of 3 to 21 years old. The students included within this study were those who had been identified through special education multidisciplinary teams as a student with Autism (or a noncategorical eligibility suspecting ASD) or had received a diagnosis through a licensed health service provider (e.g., physician, pediatrician, psychologist, etc.). Participants included those who had a full and individual evaluation (FIE) through their local education agency (LEA) or had accompanying documentation in the form of a current (within the past three years) individualized education plan (IEP) or who had a recent medical/psychoeducational report that included a diagnosis of ASD and a current standardized intellectual assessment (within the past three years). Additionally, students who had been identified as a student with ASD and were receiving services under Section 504 of the Americans with Disabilities Act (ADA) were included.

Students who did not have a current IEP within the past three years which identified them as a student with ASD, or those without a recent medical/psychological, or psychoeducational evaluation within three years, were excluded from this study. Additionally, participants' children had up-to-date cognitive testing (with the inclusion of a Full-Scale IQ score, Verbal IQ score, and/or Nonverbal IQ score) which was completed within the past three years. Those without current cognitive testing were excluded from this study. ASD was the primary diagnosis/eligibility for each student included in the study.

Participants were gathered through one of several methods. Recruitment emails were sent through several Houston, TX area school districts. In addition, emails were sent to several Houston, TX area specialty schools for children with Autism Spectrum Disorder. Participants were also recruited through participation with the University of Houston-Clear Lake Center for Autism and Developmental Disabilities Clinic (UHCL-CADD) and Psychological Services Clinic (UHCL-PSC). Additional recruitment centers included local, regional, and national community Autism partnerships such as Families for Effective Autism Treatment (FEAT), the University of Texas Leadership and Education in Neurodevelopmental Disabilities (LEND) Program, and the ARC of Greater Houston. Recruitment was also gathered online through Autism research networks such as the Asperger/Autism Network Organization for Autism Research and Autism parent support groups on social media sites such as Facebook.

Parents of the participants were provided with a flyer/letter informing them of the research study and the chance to participate. Once parents chose to participate, they were then guided through a more detailed research letter which outlined full study details. At the beginning of the presentation of the survey, subjects provided informed consent. Previous research conducted by Turek & Matson (2012) which examined the relationships between ASD, intellectual functioning, and social skills noted no significant interactions occurred within their sample. It is important to note that social skills and social-emotional learning skills are different constructs; however, they are often described similarly within the research literature (Gresham et al., 2020). Thus, it was determined that social skills research was an appropriate construct on which to base our study design. Based on the Gresham and colleagues (2020) study a small effect size would be used, and an overall general model of various predictors would be examined. An a priori power analysis in G*Power (Faul et al., 2007) estimated that for a multiple

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linear regression with five predictors (including control variables), approximately 159 participants were needed to achieve 80% power to detect a small effect size, with 55 participants needed to achieve 90% power to detect a medium effect size. The targeted number of participants for this study was 180 participants. This number was to account for various extraneous factors such as missing data, dropout, etc. In total, 231 responses were collected as part of this study. Of the 231 responses, 146 included completion of the SELSI measure. These 146 participants were included in the analysis to examine question 1, what are the typical SEL competencies exhibited by children and adolescents (ages 3-21) with ASD? Of those 146 responses, 69 included complete FSIQ scores. Thus, the 69 participants who fully completed all data (SELSI measure and FSIQ data) were included in the analyses to answer the 2nd question, to what extent does intellectual functioning (e.g., Full-Scale IQ; FSIQ) influence the overall SEL competency of an individual with ASD (when considering gender, race/ethnicity, and SES)? It was determined that FSIQ would be used rather than Nonverbal IQ (NVIQ) or Verbal IQ (VIQ) scores, as this was the most consistent score reported by parents.

The survey provided to parents was available in both English and Spanish; however, all parents completed the English form. Within this sample, children's ages ranged from 3 to 21 years old with a mean age of 8 years old ($SD = 4.33$). Of these children, 74% (N = 108) were identified as male while the remaining 38% (N = 38) were identified as female. There were no participants who identified as transgender or non-binary.

Within the sample 76% (N =111) of participants were identified as White, 10.3% (N = 15) were identified as Black/ African-American, 4.1% (N = 6) were identified as American Indian or Alaskan Native, 3.4% (N = 5) were identified as Hispanic/Latino/or Spanish Origin, 2.1% (N = 3) were identified as Asian, and .7% (N=1) were identified as

Native Hawaiian/Pacific Islander. Of the four remaining participants, three preferred to describe and reported their child's race/ethnicity as White/Hispanic and Mexican/Iranian. The third, participant noted that they preferred to describe but did not provide a further description. Finally, one participant reported that they preferred not to answer for their child's race/ethnicity. See Table 1 for a further breakdown.

At 89%, (N = 130) the majority of raters reported themselves as the biological parent, 4.1% (N = 6) reported themselves as the foster parent, 3.4% (N = 5) reported themselves as the adoptive parent, 2.1% (N = 3) reported themselves as the step-parent, and .7% (N = 1) reported themselves as "other".

Household family income was also collected as part of this project. The household incomes reported ranged from less than $10,000 to $200,000 with the mean income at $66,317 ($SD$ = 44953.83). Household incomes as well as number of individuals per household were combined using two metrics in order to dummy code SES into three categories. The first metric was the latest median household income and was based on the most current census data of national households from 2020. The reported median household income for 2020 was $67,521 (Shrider et al., 2021). The second metric used was the 2022 national poverty guidelines (ASPE, 2022). As part of the demographics survey, participants provided information about their income and the number of individuals per household. Number of individuals per household plus income are used to establish national poverty guidelines. Those who met criteria at the poverty level were classified as "low income". Those who were above the poverty line and below the 2020 median household income ($67,521) were categorized as "middle SES". Those who were above the median household income were classified as "high SES". 17.8% of participants (N=26) fell into the "low-income category", 40.4% of participants (N=59) fell into the "middle-income category", and 37.7% of participants (N=55) fell into the

"high-income category" (ASPE, 2022). Please see Table 1 for a further breakdown of this sample's socio-economic characteristics.

<div align="center">**Procedures and Measures**</div>

Demographics Survey

Parents completed this survey via an online platform, Qualtrics XM. To begin the study, participants were guided through a screen that asked questions in order to gain demographic data from each participant. These questions included their identified gender, their relationship to the child, the child's age, the child's gender, the child's grade, and the child's school. Parents also indicated the type of evaluation provided (school, medical, psychological, etc.) and the identified diagnosis/eligibility conditions. Parents also included additional background information such as individuals per household, household income, and parent and child demographics.

Additionally, formal cognitive measures, as reported by the child's parent/guardian, were recorded as part of the participant's data. Parents reported results from several different measures of cognitive/intellectual functioning. Overall, the majority of youth had been assessed with the Wechsler Intelligence Scale for Children – V (WISC-V; 21.7%), the Woodcock-Johnson IV Tests of Cognitive Abilities (WJ-IV Cog; 14.5%), and the Wechsler Preschool & Primary Scale of Intelligence (WPPSI-IV; 10.4%). Various other measures were also reported (see Table 2 for a full breakdown).

Social-Emotional Learning Skills Inventory (SELSI)

The Social-Emotional Learning Skills Inventory (SELSI; Schanding, 2017) is a narrowband instrument that measures children and adolescents' competencies in social and emotional learning domains through parent and teacher ratings. The SELSI is comprised of five subscales: Self-Awareness (SFA), Self-Management (SMG), Social Awareness, (SOC), Relationship Skills (REL), and Responsible Decision Making (RDM)

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and is based on the theoretical model issued by the Collaborative for Academic, Social, and Emotional Learning (CASEL, 2013). It contains an additional scale, Total SEL Score that provides a global aggregate score of a participant's overall social-emotional learning competencies. The SELSI is available in three age-based forms: 2-5 years, 6-11 years, and 12-21 years old. As part of this research study, the appropriate form was administered to the parent based off of the age of child provided.

The SELSI identifies the social and emotional competency strengths and weaknesses of each participant. Raters who complete the scale rate items describing the participant's engagement in SEL skills on a 4-point Likert scale (i.e. Never, Sometimes, Often, Almost Always). One recent study demonstrated that each of the SELSI scales exhibited adequate internal consistency 1) SFA, $\alpha = .88$; 2) SMG, $\alpha = .87$; 3) SOC, $\alpha = .92$; 4) REL, $\alpha = .91$; 5) RDM, $\alpha = .88$; and 6) Total SEL score, $\alpha = .98$ (Hussain et al., 2021). In the current study, the following Cronbach alpha's for Total SEL scores were reported for all three forms including, preschool, $\alpha = .88$; child, $\alpha = .93$, and adolescent, $\alpha = .95$. In addition, information was also collected across the forms for the individual scales. Please see Table 3 for an individual breakdown of scales across the current age groups.

Data Analysis

For the first question in this study, descriptive statistics related to developing a norm group for SEL competencies exhibited by children with ASD were examined. This included means and standard deviations based on the raw scores of the SELSI. In order to analyze patterns among SELSI scales, calculations accounted for the uneven amount of items within each scale when making scale comparisons. Students were placed into age brackets (e.g., 3-5, 6-11, 12-21) to examine the descriptive statistics. Included within the sample were ratings of 37 preschool-aged children, 73 school-aged children, and 37

adolescent-aged children. The current data set was also compared to a data set obtained from Hussain et al. (2021) which collected parent ratings of typically developing children aged 6-11 years old. No other normative data from the ages of 3-5 and 12-21 were available for analysis.

The second part of this study involved a correlational analysis to identify whether a relationship exists between intellectual abilities, gender, race/ethnicity, and socio-economic status (SES) in predicting the SEL competence of children with ASD. At the outcome of the study and once all data were collected, a hierarchical multiple regression model was conducted which included two steps. Regressions were then run on each step of the model in each of the three age groups (preschool, child, and adolescent) to examine potential predictive factors which existed among study variables. The first step of the model identified was SEL as an outcome variable in students with ASD with gender, SES, and race/ethnicity as covariates. The second step of the model included the same outcome variable and covariates with the addition of FSIQ as a predictor variable. Dummy coding was required for the variables of race/ethnicity and SES due to the population sample and a lack of a clear standard for determining SES. Race was collapsed into two categories due to the larger sample of white participants (e.g., white compared to racial minoritized participants, with white serving as the reference group). Middle income participants served as the reference group for SES. All statistical analyses were conducted in the Statistical Package for the Social Sciences (SPSS) version 28.

CHAPTER III:

RESULTS

Testing Assumptions

Before running hierarchical linear regression analyses, several assumptions were tested across all three age groups. First conducted was the Durbin-Watson test value, which found that test assumptions had been met. Additional collinearity diagnostic values were considered, which included: VIF, tolerance value, and eigenvalues. All values met test assumptions. Given that data collected relied on parent report, prior to conducting analyses, steps were taken in order to ensure integrity of data. Raw data was analyzed and any data which appeared false or erroneous within reported values of FSIQ [e.g., NVIQ + VIQ scores could not produce the reported FSIQ score] were excluded. Ultimately, 85 cases were completely removed for not completing the SELSI measure and not providing a FSIQ. The remainder of incomplete data (N=146) which included a complete SELSI was kept in order to analyze the first question. Of these 146 participants, 69 included FSIQ information and this information was used in order to provide analysis for the question 2.

Research Question 1

In order to address the first research question, what are the typical SEL competencies exhibited by children and adolescents (ages 3-21) with ASD, an item analysis was conducted to investigate individual patterns with respect to overall SELSI total scores and individual subscales in both neurotypical and ASD group samples. Included within this were mean statistics for each SELSI form (including total score and subscales) to determine if patterns existed on parent-rated items with respect to available age group data.

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Preschool SELSI Scale and Item Analysis

In examining parent SELSI data of preschoolers with ASD, an overall total mean score was calculated. This mean score is an aggregate of all items on the SELSI for parents of preschoolers, which includes 46 items about their child's SEL competencies. On each of these 46 items, parents answered on a Likert scale rating of 1-4 with 1=never, 2= sometimes, 3= often, and 4=almost always (similar across all forms of the SELSI screener). Higher mean scores (i.e., those closer to 4) would indicate that higher ratings were used by parents, meaning they often or frequently reported witnessing such behaviors or skills from their child. Conversely, lower mean scores (i.e., those closer to 1) would indicate that lower ratings were used by parents, meaning they never or only sometimes reported witnessing such behaviors or skills from their child.

For the parents of preschoolers with autism, a mean score of 106.62 was found for the total SEL score. This would mean that the average score or rating that parents gave when answering items was a 2.32 which falls in between the "sometimes" and "often" ratings.

Next, individual subscales were examined to determine patterns among parent ratings and to identify where parents noted strengths and weaknesses with respect to their preschooler's SEL profile. Among the SELSI subscales, parents rated their preschoolers as highest in Self-Management ($\bar{x}$= 2.51) and lowest in Social Awareness ($\bar{x}$= 2.12). Their second, third, and fourth highest ratings were Responsible Decision Making ($\bar{x}$= 2.49), Self-Awareness ($\bar{x}$= 2.38), and Relationship Skills ($\bar{x}$= 2.35), respectively (see Table 4).

Individual item analysis revealed that parents of preschoolers with ASD felt that their preschooler's highest level of SEL competency was having trust with an adult in the home setting ($\bar{x}$ = 3.45, Relationship Skills). The second, third, fourth, and fifth-highest items indicated that parents felt their preschooler often looks forward to being at home

with family ($\bar{x} = 2.98$, Self-Awareness), follows through and persists on preferred tasks ($\bar{x} = 2.89$, Self-Management), adheres to home rules ($\bar{x} = 2.78$, Responsible Decision Making), and persists in new academic tasks ($\bar{x} = 2.7$, Self-Management). Two of the five items were from the Self-Management subscale while the remaining items were from the Self-Awareness, Relationship Skills, and Responsible Decision Making subscales. There were no highly rated SEL items from the Social Awareness subscale.

Conversely, the item which parents of preschoolers with ASD rated as lowest was their ability to inquire about others' emotional experiences ($\bar{x} = 1.76$, Social Awareness). The second, third, fourth, and fifth lowest scored items for parents of preschoolers with ASD included: being easily susceptible to peer pressure ($\bar{x} = 1.89$, Relationship Skills), making positive future-oriented statements ($\bar{x} = 1.91$, Self-Awareness), thinking through consequences of actions ($\bar{x} = 1.92$, Responsible Decision Making), and exhibiting appropriate responses to others' emotional experiences ($\bar{x} = 1.97$, Social Awareness). Two of the five items were from the Social Awareness subscale while the remaining items were from the Self-Awareness, Relationship Skills, and Responsible Decision Making subscales. There were no lowest rated SEL items from the Self-Management subscale.

Child SELSI Scale and Item Analysis

In examining parent SELSI data of children with ASD, an overall total mean score was calculated. This mean score is an aggregate of all items on the SELSI for parents of children aged 6-11 years, which includes 58 items about their child's SEL competencies. For the parents of children with ASD, a mean score of 141.96 was found for the total SEL score. This would mean that the average score or rating that parents of children with ASD gave when answering items was a 2.45, which falls in between the "sometimes" and "often" ratings.

Next, individual subscales were examined to determine patterns among parent ratings and to identify where parents noted strengths and weaknesses with respect to their child's SEL profile. Among the SEL subscales, parents of children with ASD rated their child as highest in Responsible Decision Making ($\bar{x}$ = 2.57) and lowest in Self-Management ($\bar{x}$ = 2.36). Their second, third, and fourth highest ratings, respectively, were Self-Awareness ($\bar{x}$ = 2.49), Relationship Skills ($\bar{x}$ = 2.48), and Social Awareness ($\bar{x}$ = 2.47) (see Table 4).

Individual item analysis revealed that parents felt that their child's highest level of positive SEL competency included their child's feelings of looking forward to being at home with family ($\bar{x}$ = 2.96, Self-Awareness). The second, third, fourth, and fifth-highest items indicated that parents reported their children felt the presence of a trusted adult within the home ($\bar{x}$ = 2.88, Relationship Skills), could effectively make good decisions ($\bar{x}$ = 2.75, Responsible Decision Making), acted in accordance with family values ($\bar{x}$ = 2.73, Social Awareness), and was able to adhere to rules at home ($\bar{x}$ = 2.7, Responsible Decision Making). Two of the five items were from the Responsible Decision Making subscale while the remaining items were from the Self-Awareness, Social Awareness, and Relationship Skills subscales. There were no highly rated SEL items from the Self-Management subscale.

Conversely, the item which parents rated as lowest with respect to their child's level of SEL competency was their child's ability to accurately interpret thoughts and emotions of others ($\bar{x}$ = 2.22, Social Awareness). The second, third, fourth, and fifth lowest scored items related to parent's feelings about their child's SEL competencies were their child's ability to identify and accurately analyze costs and benefits of situations ($\bar{x}$ = 2.23, Responsible Decision Making), manage stress ($\bar{x}$ = 2.26, Self-Management), demonstrate self-control ($\bar{x}$ = 2.26, Self-Management), and offer

appropriate solutions to problems ($\bar{x}$ =2.27, Responsible Decision Making). Two of the five items were from the Responsible Decision Making subscale and two of the five items were from the Self-Management subscale. The remaining lowest rated SEL item was from the Social Awareness subscale.

Comparing Children with ASD to Neurotypical Children

In order to make between group comparisons between neurotypical and ASD samples for the age 6-11 years old child sample (N=73), data from parent-rated neurotypical groups were compared from a previous study (Hussain et al., 2021). This sample included 92 males and 106 females (N = 198) ages 6-11 years old. This sample did not include ages 3-5 or 12-21 thus, between group comparisons were only available for the 6-11 years old age group (child form).

In examining SELSI data of parent ratings of neurotypical children, an overall total mean score was calculated. This mean score is an aggregate of all items on the SELSI for parents of children aged 6-11, which includes 58 items about their child's SEL competencies. The mean for the neurotypical children was 171.95, while the mean for children with ASD was 141.96.

This would mean that the average score or rating that parents of neurotypical children gave when answering items was a 2.97 which falls in the "often" range. In contrast, the ASD child sample's mean indicated an average rating of 2.45, which falls in between the "sometimes" and "often" range. This would indicate that, on average, parents of neurotypical children are reporting that their children are able to perform tasks related to SEL competencies on a regular or frequent basis compared to their peers within the ASD group who were reported as being able to perform such tasks on a regular to less than regular basis. In comparing data between parent ratings of children with ASD and without ASD (neurotypical children), significant mean differences were found between

the two groups on the Total SEL score t(269) = 10.08, *p* = <.001. Overall, children with

ASD were rated lower by their parents on SEL competencies compared to neurotypical

children.

Next, individual subscales were examined to determine patterns among parent

ratings and to identify where parents noted strengths and weaknesses with respect to their

child's SEL profile. Among the SEL subscales, parents of neurotypical children rated

their child as highest in Relationship Skills ($\bar{x}$ = 3.25) while parents of children with ASD

rated this competency as their child's third-highest ($\bar{x}$ = 2.48). This would indicate that on

average, parents of neurotypical children are reporting witnessing Relationship Skill

abilities on a regular or frequent basis while parents of children with ASD are reporting

witnessing such skills on a regular to less than regular basis. In comparing data between

parent ratings of children with ASD and without ASD (neurotypical children), significant

mean differences were found between groups on the Relationship Skills total t(148.35) =

12.55, *p* = <.001, with children with ASD being rated as having lower skills compared to

neurotypical peers. Examples of items from this subscale which were rated highly by

parents of neurotypical children included reports that their child felt the presence of a

trusted adult within the home ($\bar{x}$ =3.75), had at least one peer friendship ($\bar{x}$ =3.58), and

was able to get along with adults ($\bar{x}$ =3.54).

For parents of neurotypical children, the lowest SEL domain was in Self-

Management ($\bar{x}$ = 2.83) which was also rated as the lowest area for parents of children

with ASD ($\bar{x}$ = 2.36). This would indicate that both groups feel that their child is

demonstrating Self-Management on a less than regular basis. In comparing data between

parent ratings of children with ASD and without ASD (neurotypical children), significant

mean differences were found between groups on the Self-Management total t(269) =

6.45, *p* = <.001, with neurotypical children rated higher by their parents compared to

youth with ASD. Items from this scale indicated that parents of neurotypical children felt their child struggled to set and achieve academic goals ($\bar{x}$ =2.65), manage stress effectively ($\bar{x}$ =2.66), and struggled to set and achieve personal goals ($\bar{x}$ =2.72).

The second highest-rated subscale was Social Awareness ($\bar{x}$ = 3.11) which was rated as the second-lowest by parents of children with ASD ($\bar{x}$ = 2.47). This would indicate that on average, parents of neurotypical children are reporting witnessing frequent use of Social Awareness while parents of children with ASD are reporting witnessing regular to less than regular demonstrations of Social Awareness. In comparing data between parent ratings of children with ASD and without ASD (neurotypical children), significant mean differences were found between groups on the Social Awareness total t(269) = 8.44, p = <.001 (with children with ASD being rated lower). Items from this scale indicated that parents of neurotypical children felt their child was able to recognize when others were being mean ($\bar{x}$ =3.4), demonstrated an intact moral compass with respect to family values ($\bar{x}$ =3.32), and was able to recognize nice actions in others ($\bar{x}$ =3.26).

The third highest-rated subscale was Self-Awareness ($\bar{x}$ = 3.10) which was rated as the second-highest by parents of children with ASD ($\bar{x}$ = 2.49). On average parents of neurotypical children are reporting witnessing regular use of Self-Awareness while parents of children with ASD are reporting witnessing regular to less than regular use of Self-Awareness. In comparing data between parent ratings of children with ASD and without ASD (neurotypical children), significant mean differences were found between groups on the Self Awareness total t(269) = 8.49, p = <.001 (with children with ASD being rated lower). Items from this scale indicated that parents of neurotypical children felt their child was able to recognize their own feelings of being sad and/or happy ($\bar{x}$

=3.68), looked forward to being around family members ($\bar{x}$ =3.39), and an ability to recognize their own feelings of sadness or nervousness ($\bar{x}$ =3.32).

The fourth highest-rated subscale was Responsible Decision Making ($\bar{x}$ = 3.098) which was rated as the highest by parents of children with ASD ($\bar{x}$ = 2.57). On average parents of neurotypical children are reporting witnessing regular use of Responsible Decision Making while parents of children with ASD are reporting witnessing regular to less than regular use of Responsible Decision Making. In comparing data between parent ratings of children with ASD and without ASD (neurotypical children), significant mean differences were found between groups on the Responsible Decision Making total t(269) = 8.18, *p* = <.001 (with children with ASD being rated lower). Items from this scale indicated that parents of neurotypical children felt their child struggled with working towards a "win-win" in situations ($\bar{x}$ =2.66), asking others for help ($\bar{x}$ =2.77), and thinking through consequences before making a decision ($\bar{x}$ =2.78). See Table 4 for a further breakdown of individual subscale areas.

Adolescent SELSI Scale and Item Analysis

In examining SELSI data of parent ratings of adolescents with ASD, an overall total mean score was calculated. This mean score is an aggregate of all items on the SELSI for parents of adolescents aged 12-21, which includes 59 items about the adolescent's SEL competencies. For the parents of adolescents with ASD, a mean score of 137.61 was found for the total SEL score. This would mean that the average score or rating that parents of adolescents with ASD gave when answering items was a 2.33 which falls between the "sometimes" and "often" range.

Next, individual subscales were examined to determine patterns among parent ratings of their adolescents with ASD and to identify where parents noted strengths and weaknesses with respect to their adolescent's SEL profile. Among the SEL subscales,

parents of adolescents with ASD rated their child as highest in Responsible Decision Making ($\bar{x} = 2.47$) and lowest in Social Awareness ($\bar{x} = 2.31$). Their second, third, and fourth highest ratings were Self-Management ($\bar{x} = 2.3765$), Self-Awareness ($\bar{x} = 2.3762$), and Relationship Skills ($\bar{x} = 2.37$), respectively (see Table 5).

Individual item analysis revealed that parents reported their adolescent's highest level of positive SEL competency as feeling the presence of a trusted adult within the home ($\bar{x} = 2.84$, Relationship Skills). The second, third, fourth, and fifth-highest items indicated that parents reported their adolescent demonstrated a feeling of looking forward to being at home ($\bar{x} = 2.75$, Self-Awareness), demonstrated confidence when carrying out tasks ($\bar{x} = 2.66$, Self-Awareness), often consistently told the truth ($\bar{x} = 2.64$, Responsible Decision Making), and easily forgave others ($\bar{x} = 2.57$, Relationship Skills). Four of the five items were from the Relationship Skills and Self-Awareness subscales (2 for each subscale). The remaining item was from the Responsible Decision Making subscale.

Conversely, the item which parents rated as lowest with respect to their adolescent's level of SEL competency was their adolescent's ability to motivate themselves in order to get things done ($\bar{x} = 2.08$, Self-Management). The second, third, fourth, and fifth lowest scored items related to parents' feelings about their adolescent's SEL competencies were their adolescent having a group of friends ($\bar{x} = 2.09$, Relationship Skills), an ability to connect with peers ($\bar{x} = 2.11$, Relationship Skills), recognizing that their thoughts and emotional experiences were connected to their behavior ($\bar{x} = 2.14$, Self-Awareness), and appreciating significant traits within different cultural groups ($\bar{x} = 2.16$, Social Awareness). Two of the five items were from the Relationship Skills subscale. The remainder of the lowest rated SEL items (one each) were from the Self-Awareness, Self-Management, and Social Awareness subscales.

To address the second research question, to what extent does intellectual functioning (e.g., Full-Scale IQ) influence the overall SEL competency of an individual with ASD (when considering gender, race/ethnicity, and SES), correlational data was first gathered to make a comparison between total SEL scores and FSIQ.

Correlational Data

Pearson correlation coefficients examining the Total SEL score and FSIQ were collected across each age group. Small correlations were detected between FSIQ and Total SEL for the child ($r= .359$) and adolescent ($r = .309$) samples, respectively, while a moderate correlation was detected between FSIQ and the preschool group ($r = .461$). Correlations were statistically significant within the child sample ($p < .05$) while correlations approached significance within the preschool sample ($p = .063$) and were not significant within the adolescent sample ($p = .185$). In examining the individual variables of SES, gender, race/ethnicity no significant correlations were found between these variables and Total SEL. (See Table 3)

Total SEL Score

The Total SEL score served as the dependent variable for each hierarchical multiple regression across the three SELSI forms. The regressions for analysis included one model with two steps. The first step of the model for the hierarchical multiple regression included gender, race/ethnicity, and socio-economic status (SES) as predictors of SEL competencies in preschool, child, and adolescent groups with ASD. The second step included the above variables with the addition of FSIQ. After each model was conducted, significant changes between the models were analyzed.

FSIQ Predicting SEL Skills for Preschoolers with ASD

For preschool age youth, the results of step 1 indicated that gender (β = .311, p = .186), race/ethnicity (β = -.506, p = .057), and SES (high SES, β = -.136, p = .640; low SES, β = .288, p = .335) were not statistically significant predictors of the Total SEL score. In step 2, there was a significant change in the variance by 10.5% which was accounted for by the addition of FSIQ in the equation (ΔR^2 = .105, p < .05). Further, in step 2, only FSIQ was a significant predictor of the Total SEL score (β = .473, p < .05). Thus, FSIQ served as a significant predictor for SEL competencies in preschool-aged children with ASD. Further, preschoolers with higher FSIQ scores were rated by their parents to have higher total SEL scores (see Table 7.

FSIQ Predicting SEL Skills for Children with ASD

For child age youth, the results of step 1 indicated that gender (β = .231, p = .231), race/ethnicity (β = .110, p = .607), and SES (high SES, β = .096, p = .621; low SES, β = .064, p = .764) were not statistically significant predictors of the Total SEL score. In step 2, there was a significant change in the variance by 12.8% which was accounted for by the addition of FSIQ in the equation (ΔR^2 = .128, p < .05). Within step 2 of the model (combining FSIQ with gender, race/ethnicity, and SES), FSIQ was not a significant predictor of the Total SEL score; however, FSIQ was a significant predictor of the Total SEL score on its own (β = .368, p < .05) (see Table 8).

FSIQ Predicting SEL Skills for Adolescents with ASD

For adolescent age youth, the results of step 1 indicated that gender (β = -.026, p > .05), race/ethnicity (β = -.053, p > .05), and SES (high SES, β = .382, p > .05; low SES, β = -.014, p > .05) were not statistically significant predictors of the Total SEL score. In adding the FSIQ in step 2, there was not a significant change in the variance accounted

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for in the equation ($\Delta R^2 = .126$, $p > .05$). Within step 2, FSIQ was not found to be a significant predictor of the Total SEL score ($\beta = .421$, $p = .153$). (See Table 9)

Given that FSIQ was not a significant predictor of SEL within the adolescent sample, it was determined that a posthoc power analysis would be conducted. Results of the posthoc power analysis revealed an overall power level of .58, which would indicate that the adolescent sample was underpowered.

CHAPTER IV:

DISCUSSION

The intended purpose of this research study was to address two questions: 1) what are typical social-emotional learning competencies exhibited by children and adolescents with ASD? and 2) to what extent does intellectual functioning (e.g., FSIQ) predict overall social-emotional learning competencies of an individual with ASD when considering individual factors (e.g., race/ethnicity, gender, SES)?

SEL Competency Comparisons in Neurotypical Children and Children with ASD

One important aim of this study was to not only establish some baseline level of SEL norms in ASD samples for the SELSI but also to draw comparisons between ASD and neurotypical samples. Currently though, we were only able to do that with one of the age groups, the child sample, as the SELSI is a relatively new measure and there is not extensive data available with respect to parent data at this time.

Self-Management

It was the expectation that many differences would emerge when comparing neurotypical and ASD samples of parent-reported SEL competencies. While several differences were noted, there was one common pattern which emerged within parent ratings of Self-Management. Both groups of parent ratings reported that this competency area was a relative weakness for their child with respect to their overall SEL profile. This would indicate that between the ages of 6-11 years old, Self-Management is generally viewed as a lesser developed area for children, regardless of their neurodevelopmental

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status, compared to the other SEL domains. One potential interpretation for this may be due to changes within brain development taking place during this time which are impacting these cognitive processes (i.e., executive functioning). For example, research has shown that executive functioning abilities such as emotional regulation and reward-seeking in peer presence are impacted within this specific age group (Dahl, 2004; Steinberg, 2007) which may further impede the ability to practice effective self-management. These changes within brain development may highlight children's difficulties in successfully carrying out tasks independently and managing themselves without adult assistance. Difficulties with self-management (i.e., executive functioning) within school-aged children is consistent with previous research which has shown that executive functioning is still developing during the adolescent (Best & Miller, 2010) and early adult (Romine & Reynolds, 2005) years, which may account for why parents across groups are rating it as a pattern of difficulty.

In addition to changes within development, there is some evidence to indicate that self-management is an area which is not emphasized within educational and home settings (Elias et al., 1997), leading to a potential lack of opportunity to develop this skill, and that targeting self-management specifically in this age group may be particularly beneficial (McCraty et al., 1999).

School-aged children are experiencing rapid shifts within their cognitive development processes which impact self-management (e.g., executive functioning). This fact paired with limited opportunities to effectively practice these skills across settings, gives a reasonable expectation as to why parents note this as an area of difficulty.

Relationship Skills

With respect to differences between groups, parents of neurotypical children reported the SEL competency area of Relationship Skills to be a relative strength, while parents of children with ASD found it to be an overall average ability relative to their child's overall SEL profile. The main difference observed between the groups is that while rankings of this competency area did not vary greatly, overall mean scores highlighted a significant difference (neurotypical children $\bar{x}$ =3.25; children with ASD $\bar{x}$ =2.48). This may not be overly surprising as Relationship Skills require the usage of social communication and successful social interactions, both areas of difficulty within ASD populations (Volkmar et al., 2004). As a result of these deficits, individuals with ASD find it harder to establish and maintain relationships. Overall, this supports previous findings which indicate that children with ASD find it harder to make friends and establish relationships with others (Carrington & Graham, 2001; Church et al., 2000; Marks et al., 2000; Portway & Johnson, 2003; Vasil & Molloy, 2004) than their neurotypical peers. Given that this is the case, lower performance within this competency area is what we would expect for children of ASD when we are comparing them to their neurotypical peers.

Responsible Decision Making

With respect to Responsible Decision Making, parents of neurotypical children found this competency overall to be a relatively low area for their child ($\bar{x}$ =3.098). In comparison, parents of children with ASD found this to be an overall strength for their children ($\bar{x}$ = 2.57). Even though Responsible Decision Making was rated as a higher-ranked competency by parents of children with ASD mean score differences reveal that performance within this domain still fell significantly below their neurotypical peers. While parents of children with ASD may view this domain as a relative strength within

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their child's SEL profile, research indicates this is an area that will likely be challenging across the lifespan for individuals with ASD (Luke et al., 2012). It is possible this finding may be related to some of the core features which make up ASD which include a pattern of inflexibility, insistence on sameness, and difficulties with changes in their environment. For example, individuals with ASD have been shown to demonstrate impairments within their decision-making and heightened feelings of anxiety in situations with changing or altered environments (Luke, 2011) resulting in less flexible decision making (Treadway et al., 2009). Further, when individuals with ASD are within these unpredictable social environments that have elicited emotional dysregulation, they have been shown to engage in atypical decision making patterns. For example, in one study this included individuals with autism failing to make decisions about someone's trustworthiness based off of their feelings of the others' facial expressions (Ewing et al., 2015; Klapwijk et al., 2017). Given that social environments are constantly changing and do not follow a predictable routine or sequence, it is understandable why individuals with ASD struggle to engage in effective responsible decision making.

Even though overall mean parent ratings of neurotypical children were higher than parent ratings of children with ASD, parents of neurotypical children still found this to be one of their child's lowest SEL competencies relative to their overall SEL profile. One potential explanation for this when considering the 6-11 age span may again be executive functioning. As noted prior, executive functioning is still very much within development within the school-aged years and is more well-established within adolescence (Best & Miller, 2010). As such, this lag within this area may be able to account for why both parents of children with and without ASD are noting Responsible Decision Making as a challenge.

Social Awareness

Another clear split between groups was the difference in parent ratings of Social Awareness. As expected, parents of neurotypical children provided higher ratings of their child within this area ($\bar{x}$ = 3.11) when compared to ratings of parents of children with ASD ($\bar{x}$ = 2.47) with significant mean differences between the two groups. Additionally, for parents of neurotypical children, this was viewed as a strength within their child's SEL competency while parents of children with ASD viewed it as a relative difficulty. This follows a predictable pattern as Relationship Skills were rated higher in the neurotypical sample than in the ASD sample, and Relationship Skills and Social Awareness are often used simultaneously. Given that children with ASD were rated by their parents to struggle with respect to developing relationships with peers and others, it may be expected that parent ratings of Social Awareness would follow in tandem given that relationships are developed from proficiency in Social Awareness.

Self-Awareness

With respect to the final SEL competency, Self-Awareness, differences were less pronounced. Parents of neurotypical children reported observing this behavior often within their children while parents of children with ASD reported witnessing this competency with a rating between sometimes and often. When comparing means from both samples, we see that while parents of neurotypical children found this to be a lower-ranked SEL competency area, the mean was still higher ($\bar{x}$ =3.104) than the mean obtained from parents of children with ASD ($\bar{x}$ =2.49). While parents of neurotypical children feel that this is not their child's strongest SEL competency, their ratings remain higher relative to parents of children with ASD.

Total SEL Score

Finally, in considering the overall ratings and minimum and maximum ratings of parents within both groups, results suggest that on average, parents of children with ASD rate their children's SEL skills lower than parents of children of their neurotypical peers. This remains consistent across all SEL domains and all age ranges. This is an important takeaway as it tells us that while there were individual patterns of relative strengths and weaknesses, children with ASD are being rated lower on average, which suggests a need to target all of the SEL competency areas. This finding is important, as SEL frameworks are often built with the goal of targeting typical children, rather than considering the specific needs of neurodivergent children within its implementation (CASEL, 2005). We know from our research within this study that children with ASD are lower, on average, with respect to their SEL competencies and, therefore, may be in need of targeted intervention and instruction within these areas.

SEL Competencies and ASD

With respect to SEL competencies and ASD, several trends emerged within the data. First, preschool and adolescent-aged parent ratings of individuals with ASD shared the same third, fourth, and fifth rated competency areas, indicating similarities for a majority of their SEL competency strengths and weaknesses. Patterns of similarities and differences between age groups of individuals with autism are discussed in more detail below.

Self-Management

One important difference that emerged among age groups was within the SEL competency of Self-Management. Parents of preschoolers and adolescents with ASD rated this SEL competency area as their highest and second-highest area, respectively. Conversely, parents of children with ASD rated this area as their child's lowest SEL

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competency area. One reasonable account for this finding is that there may be less of an expectation present for preschoolers to manage themselves independently, as even neurotypically developing children are less able to manage self-care without assistance during this period of development. As children age, and they transition settings (i.e., into a school) the level of expectations rise concerning what they should be able to do on their own, and it is possible deficits in competency development are more apparent in this age range. With more time spent within school settings, it may become easier for individuals with ASD to practice self-management, which may explain increases in this competency in adolescence. This supports previous research which has shown that autistic "symptoms" in individuals with ASD improve across the lifespan when enrolled in school settings (Taylor & Seltzer, 2010). This may be due in part to structured classrooms, effective and consistent routines, and environments which provide predictable consequences. Further, there is evidence demonstrating that providing neurodiverse adolescents with self-management interventions in school settings can lead to improvements in on-task behaviors (Wills & Mason, 2014). Given that a contrast exists between preschool/child/adolescent perceptions of their child's skills within this area, it is reasonable to think it is due in large part to changes in settings and expectation levels as children move beyond the preschool age.

Self-management is an important SEL competency which should be given special attention and targeted specifically in individuals with ASD. Research has shown that improvements in self-management can lead to improvements within social interactions and conversations which may help to support the underlying features of social impairment within ASD (Koegel et al., 2014). Further, The National Standards Project, an organization devoted to the establishment of evidenced-based treatments for ASD, included self-management treatments within its category of "established treatments" (the

highest level) (National Autism Center, 2015). This would suggest that intervention within self-management specifically is of notable importance within the ASD population.

Relationship Skills

Another important consideration for lower parent-rated SEL competencies in individuals with ASD is the area of Relationship Skills. Within this domain, parents of preschoolers and adolescents rated this area as the second-lowest SEL competency while parents of children rated it as the third-lowest SEL competency. Previously, Rosenthal et al. (2013) found that social-relational challenges became more evident during the adolescent period. The differences between these two ages may be due to changes in expectations for friendship. For example, Knott et al., (2006) found that school-aged children are more successful in initiating and developing friendships while adolescents and their parents found it more difficult to maintain friendships due to difficulties in conversation skills and social emotional reciprocity in their peer relationships. This may account for why parents feel that this SEL competency area improves somewhat within the child-age years and then declines with adolescence.

Responsible Decision Making

Results suggested parents of children and adolescent groups found their child's highest level of SEL competency to be Responsible Decision Making. In addition, parents of preschoolers with ASD also found this to be a high competency area, rating it as their child's second-highest competency. This was the only commonality found when comparing the child and adolescent groups in individuals with ASD. This may indicate that from a parent's point of view, responsible decision making is slightly easier for children and adolescents with ASD than preschoolers with ASD. Parents' feelings about their child's decision-making capabilities within this study are supported by previous findings. For example, Overman, et al., (2004) found improvements in decision-making

skills starting within the adolescent developmental period. These improvements may be in part due to developmental and cognitive changes which occur within late childhood to adolescence and the development of more critical thinking abilities. For example, responsible decision making often involves a level of insight and planning ahead, which we know to be somewhat more difficult in younger children as their abilities to consistently self-regulate and engage in inhibition are intact, but still developing (Garon et al., 2008). Self-regulation and inhibition are required elements of responsible decision making and diminished capacities may account for why this is rated as a higher skill within the child and adolescent groups.

Social Awareness

Parent ratings of preschool and adolescent children with ASD indicated that their child's lowest SEL competency area was in Social Awareness. This differs slightly from parent ratings of the child-aged ASD group which rated Social Awareness as their child's second-lowest SEL competency. However, parent ratings across age groups for individuals with ASD vary greatly from parent ratings in the neurotypical child sample. Parent ratings from the neurotypical child sample suggested Social Awareness as their child's second-highest SEL competency. Parents of children with ASD of all ages reported Social Awareness as an area of difficulty, which will likely persist across the lifespan. This pattern aligns fairly well with what we know and understand to be one of the core features of ASD, difficulty with social understanding (Bregman, 2005). Difficulty in social understanding is often viewed as one of the most significant and challenging aspects of ASD (Rogers, 2000) as it causes impairment within so many aspects of an individual's life and remains salient across the lifespan of individuals with ASD (Ballaban-Gil et al., 1996; Billstedt et al., 2005; Eaves & Ho, 2008; Howlin et al., 2004). Therefore, it is understandable why parents of children with ASD of all ages are

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noting it as a significant and persistent impairment as it likely impacts many areas of functioning in their child's life and is one of the more difficult areas to improve upon.

It is important to note the parent-reported difficulties (across age groups) in both Relationship Skills and Social Awareness. These two areas of weakness are closely linked and contingent upon one another and research has shown that in individuals with ASD, those with a lack of reciprocal relationships were due to impairments in social functioning (Orsmond et al., 2004). Therefore, it makes sense that individuals with ASD are struggling with understanding how to develop and carry out relationships successfully, as a core deficit underpinning this relational difficulty is challenges with social understanding of others and lacking awareness of the thoughts, perspectives, and feelings of others. If an individual is unable to take on the perspective of someone else and meet the needs of another individual in a relationship, it is unlikely that the relationship will be successful in the long term.

These two findings are particularly important from this research study as the data would suggest that difficulties with social awareness and relationship skills are present early on and will likely remain stable throughout adolescence for an individual with ASD. It is necessary that when considering the individualization of SEL in ASD populations, we pay close attention to these two competencies as they are directly related to some of the key diagnostic features found within ASD. From here this should guide us within our future treatment. Specifically, in helping individuals with ASD to build upon and develop these skills early.

Self-Awareness

Another trend which was evident across parent ratings of age groups was parents' report of Self-Awareness as an overall average competency area with respect to their child's overall SEL profile throughout their development. Parents of children with ASD

rated this as slightly higher than parents of preschoolers and adolescents with ASD. This indicates that from a parent's perspective, Self-Awareness is worse within earlier and later childhood development but improves within school-aged childhood (6 to 11 years old). This could be due in part to developmental and biological changes and maturation. For example, from a developmental perspective, beginning in early childhood (15-24 months), children began to develop a sense of self (Bullock & Lutkenhaus, 1990; Kagan, 1981; Lewis & Brooks-Gunn, 1979; Lewis & Ramsay, 2004; Lewis eet al., 1989; Stipek et al., 1990) and recognize their own thoughts and feelings. While they are able to utilize this skill, they are not fully able to integrate it with the thoughts and feelings of others and changing conditions within their environment, thereby regulating their behavior, until later in childhood (Collins, 1984). Further, with preschoolers, we might expect this to be lower as they may have not had as much exposure to peer and group settings where this skill is modeled, compared to school-aged children. In addition, their levels of introspection and thought are very much within a period of development (Guajardo, & Turley-Ames, 2004), and as such, requires more time to be utilized within everyday practice.

This skill may improve somewhat by being exposed to peer and group settings during the transition to attending school, which could account for the increase within the child sample. According to parents, self-awareness declines within the adolescent stage. What may account for this shift is again maturational changes. For example, Huggins et al., (2021) found that difficulties with self-awareness increased in adolescents with ASD starting at 12 years old and differed from the school-aged sample. Further, these difficulties also occurred within a developmental period when individuals with ASD began to experience an increase in emotional and behavioral health symptoms (e.g., anxiety and depression). Both anxiety and depression have been associated with

decreased self-awareness (Demiralp, 2012; Kashdan & Farmer, 2014) and increases within these symptoms thereby could help to serve as potential explanations. This understanding of the shifts within self-awareness at early and later stages of childhood development is very important for researchers and practitioners to investigate. Self-awareness may likely serve as an important area to target for treatment, in particular, prior to the adolescent stage when adolescents with ASD are found to struggle more within this area (Huggins et al., 2021).

Intellectual Functioning and SEL

The second question posed by this study was to what extent does intellectual functioning (e.g., FSIQ) influence the overall social-emotional learning competencies of an individual with ASD when considering individual factors (e.g., race/ethnicity, gender, SES)? Ultimately, intellectual functioning was significantly associated with SEL competencies in both preschoolers and children with autism. Across the adolescent age sample, intellectual functioning did not impact the presence of SEL competencies; however, these findings should be interpreted with caution as the small sample of adolescents led to this analysis being underpowered.

The relationship demonstrated between intellectual functioning and SEL for preschoolers in our sample is consistent with research indicating cognitive functioning is a contributor to social and emotional understanding in youth with ASD (McClelland et al., 2000; Salomone et al., 2019). Further, long-term outcome research has shown that early childhood IQ plays a significant role in social functioning in adults with ASD (Eaves & Ho 2008; Farley et al. 2009).

When considering preschoolers specifically, IQ served as a predictor for SEL competencies in their children. These findings are consistent with previous research in preschool development. For example, Denham et al. (2014) found that higher social and

emotional abilities were related to academic success among preschoolers. Given that intellectual functioning often serves as a predictor of academic success in preschoolers with ASD (Miller et al., 2017) it is likely that intellectual functioning can also help to support SEL competency development in preschoolers with ASD.

While it was established that a significant effect was not found within the overall model of the child sample, it is important to note that IQ on its own, was found to be a significant predictor of SEL functioning in children with ASD. Further, the data revealed a moderate correlation between FSIQ and SEL skills in children with ASD. This is important as there is some relationship present between the two variables within this age group; however, the relationship cannot be explained by the variables within this study (i.e., age, gender, SES, race/ethnicity).

The second part of this question is the consideration of the effects of individual factors (e.g., race/ethnicity, gender, SES) as contributors to acquiring SEL, as well as how they predict SEL in combination with intellectual functioning. In the preschool-aged and child samples, on their own, these individual difference factors were not found to be significant contributors to SEL. When paired with intellectual functioning, the overall model was significant; however, intellectual functioning was found to be the only significant contributor in the model; individual factor variables (e.g., gender, race/ethnicity, SES) did not significantly predict any variance. Therefore, it is appropriate to say that these individual factors did not contribute significantly to preschool and child samples. This mirrors a previous meta-analysis of SEL interventions by Taylor et al., (2017) which noted that intervention effects were similar among all children from diverse backgrounds including a range of race/ethnicity, SES, and gender. This is another hopeful finding as it demonstrates that children from all backgrounds, regardless of their individual factors, are able to attain their SEL competencies. Therefore, individual factors

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which could potentially serve as deterrents (such as SES), may not prevent children from acquiring SEL. This provides a hopeful outlook for treatment as we can assume individual factors which cannot be changed will not prevent individuals from growth within their SEL competencies. Further, we know that individual diversity factors within ASD specifically can sometimes present with further treatment disparities. With that being said, it is still important to take a critical view of SEL and how that may or may not align with an individual's culture or values when treatment planning.

Limitations and Future Directions

One of the most significant limitations of this study was the fact that the collection of FSIQ relied on accurate parent report. Parents within this study frequently filled out the SELSI measure to completion but left gaps within their reports of FSIQ. This may be due in part to parents not understanding how to navigate their child's psychological evaluation report. For future research, it may be beneficial to work with school officials or providers who are more familiar with FSIQ scores and can access the information more easily, or youth may need to be tested directly by the research team.

Another significant barrier within this study is the underpowered adolescent sample. This presents a challenge as it is difficult to conclude definitively whether there is a relationship between ASD SEL skills and intellectual functioning. This research study provided some preliminary evidence that SEL and cognitive functioning could be related in adolescents with ASD ($r = .309$); however, a full determination cannot be made at this time. It will be important for future research to aim their efforts to target this group specifically as it is likely with a larger sample of adolescents, results would be comparable to what was found within the preschool and child groups.

Whenever making analyses between the neurotypical and child samples, it is important to note that there was not an equal sample among the two. First, our sample

included 73 children with ASD while the neurotypical sample included 198. Second, our sample presented with predominantly females while the opposite was seen within the ASD sample. Future studies may look at group comparisons between groups which are more equitable among their individual variables.

When looking at initial consistency ratings for the SELSI measure, ratings from a previous study reported excellent Cronbach alpha values. However, within this study, lower values were reported. This may be due in part to the sample and inherent response styles of raters. No matter, this will be an important consideration in moving forward with this measure in similar populations.

One of the strengths of this study was that parents from all over the United States were able to participate, which allowed collection of information which was nationally representative. However, the predominant ethnic group which was represented within this sample was Caucasian children. Previously within the research, it was shown that minorities were underrepresented within the autism population (Mandell, et al., 2002); however, current research suggests that while some underrepresentation may be present in certain communities, overall, the gap may be starting to close with respect to minority representation in the diagnosis of ASD (Maenner et al., 2021). As such, it is necessary that research within the field of ASD must be representative of the current races and ethnicities which make up the national population so as to inform evidenced-based practice that is representative of all individuals.

Another important variable for consideration was how SES was defined within this study. Within the field of psychological research, SES continues to be a variable which has not been clearly and uniformly defined. This study attempted to define SES in a manner which was representative of national data; however, within the future, there will likely be better and more accurate means of defining SES. As SES was not determined to

be a significant predictor of SEL within this study, it would be interesting to see if that changes once the field comes up with a more concrete means of defining SES.

An important future direction for this research includes collecting teacher data. All of the data collected within this study was based on parent report. Given that parent and teacher reports present with differing perspectives and can provide insight into behavior across a range of settings, it would be interesting to see how teacher and parent ratings compare and what differences may or may not exist between the two. Further, collecting teacher data is especially important given they often times serves as some of the main interventionists within SEL programs and are trained in assessment of SEL competencies. Collecting both parent and teacher ratings in the future will help to better establish norms for SEL competencies in students with ASD which will help to inform treatment processes across settings.

Practical Implications

SEL is a framework which has recently gained a lot more attention and is being given more priority within schools. As shown from the data within this study, parents report quantitative differences among the different SEL competencies in children with ASD. Given that this is the case, SEL should be targeted not only in general education students but should also be applied as a potential intervention for students with ASD.

Within current educational systems, many teachers struggle with how to accurately meet the needs of their students with ASD and address their deficits within their curriculum, which often results in a lack of effective intervention for students with ASD (Test et al., 2014). Further, educators often find it difficult to not only conceptualize where student needs fall within this domain but also how to translate those needs into meaningful IEP interventions (Gelzheiser et al., 1998; Giangreco et al., 1994; Michnowicz et al.,1995). As a result, inappropriate interventions are put into place in

school settings to address the social skills of individuals with ASD which are not properly suited to address their needs, and as a result, are often ineffective (Bellini et al., 2007). SEL may lend itself as a feasible solution for addressing this problem. Currently, SEL competencies have been adopted across all 50 states for preschool students and in 27 states for K-12 students (Dermody & Dusenbury, 2022). Educators can start to extend this further to their students with ASD as part of their IEP or 504 plans and by doing so address some of the traditional hurdles experienced when planning for students with ASD. In doing so, SEL may start to make meaningful changes which can carry over across settings and produce the same level of long-term benefits which are found within neurotypical samples.

SEL is not an overnight solution that can fix the school intervention gap in all students with ASD; however, given that it is being utilized within schools and has provided meaningful long-term benefits to students to whom it has been provided, it can be a practical solution for addressing systemic difficulties of supporting students with ASD in school settings. Just like any change which takes place within schools, this will take considerable time and effort. However, teachers, school psychologists, administrators, and parents, can all begin to see the benefit and feel the positive impact on their students with autism.

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APPENDIX A:

TABLES

Table 1

Participant Demographic Characteristics

Race/Ethnicity	%	N
White	76	111
Black/African American	10.3	15
American Indian or Alaskan Native	4.1	6
Hispanic/ Latino/ or Spanish Origin	3.4	5
Asian	2.1	3
Native Hawaiian/ Pacific Islander	.7	1
Biracial	2	1.4
Prefer not to answer	2	1.4
Gender		
Male	74	108
Female	26	38
Socio-Economic Status (SES)		
Low SES	26	17.8
Middle SES	59	40.4
High SES	55	37.7

Table 2

SELSI Internal Consistency Ratings for Parent Ratings of Youth with ASD

	Preschool	Child	Adolescent
	α	α	α
Self-Awareness	.69	.46	.84
Self-Management	.61	.60	.66
Social Awareness	.75	.83	.87
Relationship Skills	.79	.80	.85
Responsible Decision Making	.46	.61	.70
Total SEL SCORE	.88	.93	.95

Table 3

Independent Variables and SEL Correlational Data

	Preschool Total SEL (N=17)	Child Total SEL (N=73)	Adolescent Total SEL (N=19)
FSIQ	.46	.36*	.31
High SES	-.072	-.083	.324
Low SES	.216	.195	.088
Race/Ethnicity	.013	-.167	-.110
Gender	.117	-.011	.090

*$p < .05$

Table 4

Participant Evaluation History

Cognitive Measures Reported	%	*N*
WISC-V	21.7	15
WJ-IV	14.5	10
WPPSI-IV	10.14	7
SB-5	8.7	6
CAS-2	8.7	6
WAIS-IV	7.25	5
WNV	7.25	5
RIAS-2	5.8	4
ECAD	5.8	4
LEITER-3	4.35	3
TONI-4	2.9	2
KABC	2.9	2

Wechsler Intelligence Scale for Children, Fifth Edition (WISC-V), Woodcock Johnson Test of Cognitive Ability, Fourth Edition (WJ-IV), Wechsler Preschool & Primary Scale of Intelligence, Fourth Edition (WPPSI-IV), Stanford-Binet Intelligence Scales, Fifth Edition (SB-5), Cognitive Assessment System, Second Edition (CAS-2), Wechsler Adult Intelligence Scale, Fourth Edition (WAIS-IV), Wechsler Nonverbal Scale of Ability (WNV), Reynolds Intellectual Assessment Scales, Second Edition (RIAS-2), Woodcock Johnson, Fourth Edition, Test of Early Cognitive & Academic Achievement (ECAD), Leiter International Performance Scale, Third Edition (LEITER-3), Test of Nonverbal Intelligence, Fourth Edition (TONI-4), Kaufman Assessment Battery for Children (KABC)

Table 5

Comparison of Parent Rated SEL Competencies

SEL Scale	Preschool ASD Sample (N=17) x̄	Neurotypical Child Sample* (N=198) x̄	Child ASD Sample (N=73) x̄	Adolescent ASD Sample (N=19) x̄
SFA	2.38	3.10	2.49	2.38
SMG	2.51	2.83	2.36	2.38
SOC	2.12	3.11	2.47	2.31
REL	2.35	3.25	2.48	2.37
RDM	2.49	3.10	2.57	2.47
Total SEL Score	106.62	179.95	141.96	137.61
Min/Max Scores	80-132	105-232	87-208	78-221

SMG=Self-Management, REL= Relationship Skills, RDM= Responsible Decision Making, SOC= Social Awareness, SFA= Self-Awareness and Total SEL Score

* Data from Hussain et al. 2021.

Table 6

Hierarchical Linear Regression Data Predicting SEL competencies in Preschoolers with ASD

Predictor	Model 1			Model 2				
	B	*SE*	*β*	B	*SE*	*β*	*Partial*	*Part*
Constant	106.56	7.86		70.54	22.59			
Gender	9.54	6.80	.311	11.54	6.44	.38		
Race/Ethnicity	-.33	.16	-.51	-.17	.18	-.26		
Low SES	10.37	10.32	.29	5.88	9.97	.16		
High SES	-4.17	8.7	-.136	-9.30	8.65	-.303		
FSIQ				.40	.24	.47*	.45	.32
R^2		.49			.60			
ΔR^2					.11			
F for ΔR^2		2.89			2.84			

*p < .05

Table 7

Hierarchical Linear Regression Data Predicting SEL competencies in Children with ASD

	Model 1			Model 2				
Predictor	B	*SE*	*β*	B	*SE*	*β*	*Partial*	*Part*
Constant	133.07	5.31		100.81	16.16			
Gender	9.65	7.88	.23	10.27	7.46	.25		
Race/Ethnicity	4.79	9.21	.11	2.48	8.79	.06		
Low SES	2.82	9.27	.06	.98	8.81	.02		
High SES	3.72	7.45	.10	2.64	7.07	.07		
FSIQ				.35	.17	.37*	.37	.36
R^2		.06			.19			
ΔR^2					.13*			
F for ΔR^2		.44			4.41			

*p < .05

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Table 8

Hierarchical Linear Regression Data Predicting SEL competencies in Adolescents with ASD

| | Model 1 | | | Model 2 | | | | |
Predictor	B	*SE*	*β*	B	*SE*	*β*	*Partial*	*Part*
Constant	131.26	17.55		86.92	33.70			
Gender	-2.07	20.16	-.03	-4.91	19.38	-.06		
Race/Ethnicity	-3.67	19.26	-.05	-16.70	20.33	-.24		
Low SES	-1.26	26.56	-.01	3.96	25.63	.05		
High SES	24.80	18.64	.38	21.96	17.93	.34		
FSIQ				.57	.38	.42	.39	.36
R^2		.16			.29			
ΔR^2					.13			
F for ΔR^2		.67			2.30			

*p < .05

APPENDIX B:

INFORMED CONSENT FORM

Informed Consent: Adult Research Participant
You are being asked to participate in the research project described below. Your participation in this study is entirely voluntary and you may refuse to participate, or you may decide to stop your participation at any time. Should you refuse to participate in the study or should you withdraw your consent and stop participation in the study, your decision will involve no penalty or loss of benefits to which you may be otherwise entitled. You are being asked to read the information below carefully, and ask questions about anything you don't understand before deciding whether or not to participate.

Title: ASSESSING AND PREDICTING SOCIAL EMOTIONAL LEARNING COMPETENCIES FOR STUDENTS WITH AUTISM SPECTRUM DISORDERS

Principal Investigator(s): Hannah Hyatt Hartnett
Student Investigator(s): Hannah Hyatt Hartnett
Faculty Sponsor: Dr. Thomas Schanding

Purpose of the Study: Caregivers of students with Autism Spectrum Disorders (ASD) between the ages of 3-21 are being asked to participate in an online survey looking at social and emotional skills in students with autism.

Social-Emotional Learning (SEL) is an intervention which can be used both system-wide (such as in entire schools) and in small groups and can help to identify social and emotional difficulties students may be experiencing. Students with autism often display learning difficulties within these areas and this study aims to address such difficulties by first collecting and establishing data in order to effectively provide intervention on such difficulties. By collecting data on these difficulties in students with autism, the data can then be used to help inform educators and providers in the future on how to provide social emotional learning interventions to students with autism.

Additionally, this study is looking to investigate whether differences in individuals with autism (such as intelligence, gender, race, ethnicity, and SES) can influence whether or not students with autism are able to gain social and emotional learning skills.

Procedures: All data collection will be completed online through Qualtrics. Parents will be sent links on how to access study instruments online and will be given guidance and instruction to completing study instruments. Data will be collected through the online SELSI universal screening measure via parent ratings.

Expected Duration: This study is expected to last from October 2020 until January 2022.

Risks of Participation: There are no anticipated risks of participation.

Benefits to the Subject: There is no direct benefit received from your participation in this study, but your participation will help the investigator(s) to better understand social-emotional learning competencies in children with ASD.

Confidentiality of Records: Every effort will be made to maintain the confidentiality of your study records. The data collected from the study will be used for educational and publication purposes, however, you will not be identified by name. For federal audit purposes, the participant's documentation for this research project will be maintained and safeguarded by the Principal Investigator or Faculty Sponsor for a minimum of three years after completion of the study. After that time, the participant's documentation may be destroyed.

Compensation: Upon completion of the study, participants will provide their email and be entered into a raffle for the chance to receive one of three $25 gift cards.

Investigator's Right to Withdraw Participant: The investigator has the right to withdraw you from this study at any time.

Contact Information for Questions or Problems: The investigator has offered to answer all of your questions. If you have additional questions during the course of this study about the research or any related problem, you may contact the Principal Investigator, Hannah Hyatt Hartnett by email at HyattH0885@uhcl.edu.

Identifiable Private Information: Identifiers might be removed from identifiable private information or identifiable biospecimens and that, after such removal, the information or biospecimens could be used for future research studies or distributed to another investigator for future research studies without additional informed consent from the subject or the legally authorized representative, if this might be a possibility
I agree

APPENDIX C:

DEMOGRAPHICS SURVEY

1. Parent's Name
2. Parent's Gender
   - Female
   - Male
   - Other/Prefer to Describe
3. Please describe your gender.
4. Child's Name
5. Relationship to Child
   - Biological Parent
   - Step Parent
   - Adoptive Parent
   - Foster Parent
   - Grandparent or Other Family Member
   - Other Caregiver
6. Child's date of birth:
7. Child's Grade
8. Child's Gender
   - Male
   - Female
   - Other/Prefer to Describe
9. Child Race/Ethnicity
   - White
   - Black or African American
   - American Indian or Alaskan Native
   - Asian
   - Native Hawaiian / Pacific Islander
   - Hispanic/Latino/ or Spanish Origin
   - Middle Eastern or North African
   - I prefer not to answer
   - Prefer to describe
10. Describe your child's gender.
11. Household Income (yearly)
12. Number of individuals in household (adults + children)
13. What is the date of your child's most recent IQ (cognitive) evaluation (school-based report, psychological report, medical report)?
14. What specific IQ test was administered to your child in their last IQ (cognitive) evaluation?
   - Differential Ability Scale-2 (DAS-2)
   - Stanford-Binet 5 (SB-5)
   - Wechsler Intelligence Scales for Children-V (WISC-V)

- Wechsler Adult Intelligence Scale-IV (WAIS-IV)
- Wechsler Preschool and Primary Scale of Intelligence-4 (WPPSI-4)
- Wechsler Nonverbal Scale of Ability (WNV)
- Woodcock-Johnson Tests of Cognitive Ability 4 (WJ-4 Cog)
- Woodcock Johnson 4 Tests of Early Cognitive and Academic Development (ECAD)
- Leiter-3 Nonverbal Cognitive and Neurospsychological Assessment
- Test of Nonverbal Intelligence- 4 (TONI-4)
- Reynold's Intellecutal Assessment Scales-2 (RIAS-2)
- Cognitive Assessment System-2 (CAS-2)
- Kaufman Assessment Battery for Children-2 (KABC-2)
- Other?

15. What is your child's Full Scale IQ score from the most recent evaluation report?
16. What is your child's Verbal IQ score from the most recent evaluation report?
17. What is your child's Nonverbal IQ score from the most recent evaluation report?
18. Child's Age