MIDDLE SCHOOL STUDENTS' BELIEFS ABOUT UNFAMILIAR PEERS WITH AUTISM: EXAMINING GENDER DIFFERENCES

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ABSTRACT

MIDDLE SCHOOL STUDENTS' BELIEFS ABOUT UNFAMILIAR PEERS WITH AUTISM: EXAMINING GENDER DIFFERENCES

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The American Psychiatric Association (2013) defines autism spectrum disorder (ASD) as a neurodevelopmental disorder characterized, in part by social communication impairments. With the implementation of the Individuals with Disabilities Education Act (IDEA, 1997), students with ASD have been increasingly placed in general education classrooms with the objective being to improve these students' social skills and academic development (Chamberlain et al., 2007). However, students with ASD face challenges to being fully included in the general education setting (Chamberlain et al., 2007; Rotherham-Fuller et al., 2010; Locke et al., 2010). To mitigate these challenges, peer interventionists help foster the social engagement of students with ASD (Wong et al., 2015; Hume & Campbell, 2019). In order to select effective peer interventionists, it is important to understand factors, such as knowledge of ASD, attitudes about ASD, peer gender, and self-efficacious beliefs, that may influence their perceptions and behavioral intentions towards students with ASD. This study aimed to investigate how student's gender, knowledge of ASD, and gender of a student with ASD influenced their attitudes towards peers with ASD as well as their own self-efficacious beliefs about serving as a peer interventionist. Recruitment was impacted by the COVID-19 pandemic as many schools had

restrictions in place to maintain student safety. Middle school students (n = 33) were recruited from schools in Western North Carolina and asked to answer questionnaires, after reading vignettes that varied on whether the student was depicted as a boy or a girl with ASD and whether or not an explanation of ASD was present. Because of COVID-19, many of the data collection sessions were conducted virtually. Multifactorial ANOVAs were conducted to determine if these variables influenced peers' attitudes and feelings of self-efficacy. A multiple regression was used to determine what sources of self-efficacy contributed to these self-efficacious beliefs. Nonparametric analyses were conducted when the sample did not meet normality assumptions. Students felt more capable of working with a girl with ASD compared to a boy with ASD, and physiological states significantly influenced middle schoolers' feelings of self-efficacy in serving as a peer interventionist. Future research should continue to explore the impact gender and sources of self-efficacy have on children's attitudes and beliefs about peers with ASD.

Keywords: Peer interventions, gender differences, Autism, attitudes, self-efficacy

CHAPTER ONE: INTRODUCTION

According to the Diagnostic and Statistical Manual of Mental Disorders Fifth Edition (American Psychiatric Association [APA], 2013), autism spectrum disorder (ASD) is a neurodevelopmental disorder that is characterized by social communication impairments. ASD varies greatly in the level of impairment. Social communication deficits that characterize ASD include difficulties with socio-emotional reciprocity, interpreting nonverbal social cues, and adapting behavior to social situations (APA, 2013). Individuals with ASD also present with restricted, repetitive patterns of behavior, interests, or activities (e.g., hand-flapping, preoccupation with specific objects or subjects, difficulties with transitioning, hyper- or hyposensitivity (APA, 2013). ASD includes heterogeneous presentations involving varying degrees of severity and symptomology that impact an individual's functioning in areas of social interactions and communication. According to statistics gathered from 2014-2016, approximately 2.47% of children and adolescents in the United States are diagnosed with ASD (Xu et al., 2018). There is a higher prevalence of diagnosis for boys than girls with a ratio of about three boys diagnosed for every girl receiving an ASD diagnosis (Xu et al., 2018).

The Individuals with Disabilities Act (IDEA, 1997) greatly impacted education for students with ASD. IDEA mandates that students with disabilities be educated in the least restrictive learning environment possible (Segall & Campbell, 2014). Since IDEA was implemented, students with ASD have been increasingly placed in general education classrooms with the objective being to improve these students' social skills and academic development (Chamberlain et al., 2007). However, students with ASD may not be included in general

education because of teachers' perceptions. Teachers at different school levels (e.g., elementary, middle, and high school) hold different beliefs about students with ASD that could influence where they chose to place these students (Park & Chitiyo, 2011). Elementary school teachers have more positive attitudes towards students with ASD compared to middle school teachers (Park & Chitiyo, 2011). Furthermore, since ASD involves heterogeneous presentations, it is important to investigate if cognitive ability and behavior patterns impact whether these students are placed in general education classes. Segall and Campbell (2014) found that teachers placed students with ASD and comorbid cognitive impairment in more restrictive environments. Also, teachers placed students that they perceived as having more disruptive behaviors in classes other than their own classrooms (Segall & Campbell, 2014). There are also other barriers that exist for these students regarding complete integration into general education settings (e.g., social acceptance, integration into friend groups).

Social Experiences of Students with ASD in Inclusive Classrooms

Although many students with ASD are being placed in inclusive classrooms, they still face isolation or exclusion from their peers. Students with ASD experience difficulties integrating into general education classrooms, specifically socially. For example, Chamberlain and colleagues (2007) found elementary students with ASD had significantly lower overall social network centrality, companionship, and frequency of friendship reciprocity than their typically developing peers. These findings were rather robust with a relatively large effect size (η^2 = .17, .13, .17 respectively; Chamberlain et al., 2007). It is interesting to note that elementary students with ASD did not report differences in friendship quality or experienced loneliness compared to their typically developing peers (Chamberlain et al., 2007). However, this may be due to a lack of insight on the part of students with ASD. Similar results were found in a study that examined

grade level differences (Rotherham-Fuller et al., 2010). Rotheram-Fuller and colleagues (2010) examined reciprocal friendship nominations, general acceptance or rejection in the classroom, and social network connections of 79 children with ASD and 79 gender-matched typically developing peers. Analysis showed that children with ASD were more likely to be socially included in their classroom social networks in early and middle elementary school stages than in late elementary school (Rotheram-Fuller et al., 2010). This suggests that social inclusion for students with ASD might become more difficult as they advance through school.

These findings do seem to persist into adolescence and young adulthood. For example, Locke and colleagues (2010) found that adolescents with ASD experienced significantly higher levels of loneliness and lower scores of friendship quality on measures of companionship and helpfulness when compared to peers (Locke et al., 2010). Furthermore, all the students with ASD nominated another student with ASD as their best friend, and the students with ASD created two semi-separate subgroups that were on the periphery of the larger class social network of the typically developing adolescents (Locke et al., 2010). Even in adulthood, young men with ASD report experiencing more feelings of loneliness and lower levels of self-efficacy and life satisfaction compared to neurotypical peers (Feldhaus et al., 2015). This suggests that inclusion alone may not be able to fully integrate students with ASD or provide them with the necessary social skills without the assistance of interventions.

Peer Mediated Instruction and Interventions for Students with Autism Spectrum Disorder

In order to alleviate this social isolation for students with ASD, interventions are implemented in classrooms, such as social skill training or peer-mediated interventions. School-based social skills intervention were previously used to train students with ASD on how to identify and interpret social cues, however, a meta-analysis conducted by Bellini and colleagues

(2008) found school-based social skills programs had minimal effectiveness in improving social skills in children with ASD and showed low generalizability of those skills to other settings. Peer-mediated instruction and intervention is another evidence-based practice typically implemented in classroom settings (Wong et al., 2015; Hume & Campbell, 2019). Peer-mediated instruction and intervention encompass training of peers to provide students with ASD opportunities for social interaction and act as receptive social partners (Hume & Campbell, 2019). Students with ASD that engage in peer-mediated interventions have shown improvements in vocal expressiveness (Dolan et al., 2016), increased social responsiveness (Odom & Strain, 1986), more frequent friendship nominations (Kasari et al., 2011), and decreased isolation (Kasari et al., 2011). Peer-mediated interventions have also shown to improve the frequency of social contact initiation by students with ASD both inside and outside of class (Collet-Klingenberg et al., 2012) as well as increasing engagement in school activities (Clarke & Duda, 2019). Additionally, peers increased their frequency of initiating contact with adolescents with ASD (Collet-Klingenberg et al., 2012). This demonstrates that outcomes that are the result of peer-mediated interventions can be generalizable and lead to reciprocal social interactions for students with ASD.

One frequent criticism of peer-mediated interventions is the possibility for burnout and negative social impact on the peer interventionists. However, a study conducted by Locke, Rotheram Fuller, and Kasari (2012) found that peer models were more likely to be well connected in their classrooms both upon initial selection for the program and at the end of the program. Typically developing peer models also maintained high friendship quality both at the beginning and end of the program (Locke et al., 2012). Typically developing adolescents that engaged in a peer-mediated intervention program reported being more patient in general and

more accepting of themselves (Collet-Klinger et al., 2012). Carter and colleagues (2019) also found that peer mentors in postsecondary inclusive programs reported benefits such as gaining new friendships, a greater appreciation for diversity, and more comfortable in interactions. Based on these findings, peer-mediated interventions appear to be mutually beneficial for both peer interventionists and students with ASD. Peer interventionists that are effective are essential to the success of this type of intervention, so it is important that they be willing to participate in the program (Sperry et al., 2010). In order to identify these peers, it is important to understand the factors, such as knowledge of ASD, attitudes towards students with ASD, and feelings of self-efficacy towards students with ASD, that influence peers' willingness and behavioral intentions regarding being a peer interventionist.

Influences on Peer Mediated Instruction and Interventions

The literature suggests that gender may influence whether or not a student volunteers to be a peer buddy (Carter et al., 2019). When interviewing 250 peer mentors at five universities with inclusive post-secondary programs, Carter and colleagues (2019) found that the majority of the student volunteers were female and endorsed high expectations of their peer buddies, including developing new friendships and holding down a job. In another study, Carter and colleagues (2001) found that in high school, girls more often volunteer to be a part of peer buddy programs with students with ASD. However, when selection is based on teachers' recommendations versus volunteering, boys are more often chosen to act as peer buddies for students with ASD (Jackson & Campbell, 2009). Though, in regard to the willingness of students, women and girls seem more willing to act as peer interventionists for students with ASD.

Willingness to volunteer may be in part due to more positive attitudes towards students with ASD. Women and girls have been shown to endorse more positive attitudes towards people with disabilities (Lochner, 2019). For example, female teachers endorsed higher positive attitudes towards children with ASD compared to their male counterparts (Park & Chitiyo, 2011). Iobst and colleagues (2009) reported a similar finding that women rated children both with and without ASD more favorably than their male colleagues. Although prior studies suggest that children are more likely to avoid or dislike a student with ASD compared to an adult (Harnum et al., 2007), women and girls' positive attitudes towards people with disabilities persist across different ages (Campbell, 2006). For example, in a Canadian sample, only gender had a significant main effect on attitude, such that Canadian girls tended to have more positive attitudes toward peers with disabilities compared to Canadian boys (Tirsoh et al., 1997). Multiple studies have shown that girls endorse more favorable attitudes towards children with ASD compared to boys (Bossaert et al., 2011; Campbell et al., 2004; Campbell, 2007; Campbell et al. 2019) There are a few possible explanations for this robust difference. Tipton and Blacher (2013) found that women demonstrated higher overall total knowledge of ASD compared to men. Another, and more likely explanation, is that women are socialized to be more friendly and social than boys thus endorsing more socially desirable attitudes.

Peer Homophily

Despite robust gender differences, it is important to investigate the impact this may have on peer interventionist selection and intervention outcomes for students with ASD. Locke, Anderson, Frederick, and Kasari (2018) examined how the gender of friendships impact students with ASDs' social network connectivity and friendships. One hundred twenty-six children with ASD and their peers, all ages 5 to 12, completed the Friendship Survey (Locke et al., 2018).

Results indicated that boys with ASD had lower connectivity if they had more heterophilic friendships or friendships with girls; this same effect of heterophilic or cross-gender friendships decreasing social connectivity was not seen for girls with ASD (Locke et al., 2018). This suggests that same-sex friendships are important to classroom integration, specifically for boys with ASD. This relates to the theory of homophily, which states that children tend to bond with others that are similar to themselves (Shrum et al., 1988; Dijkstra et al., 2007). Gender homophily in friendships has shown to gradually decrease starting in middle school and continuing into high school (Shrum, Cheek, & Hunter, 1988). However, more recent research suggests, that in preadolescents gender remains predictive of peer acceptance, but that may depend on the peers' helping versus bullying behavior (Dijkstra et al., 2007). Gender homophily of the peer interventionist may be an important factor in fostering positive social outcomes for the student with ASD. Interventions should thus be aimed at fostering positive behavioral intentions in both genders.

Impact of Peer Educational Interventions for Autism Spectrum Disorder

This leads to the question of how to improve the attitudes of peers towards students with ASD. More contact with students with ASD and increased knowledge of ASD may be the answers to improving attitudes in peers without ASD (Neville & White, 2011). Studies with college students (Neville & White, 2011) and other university personnel (Tipton & Blacher, 2013) have found that having a first-degree relative with a disability or more contact (Gardiner & Iarocci, 2013) with a person with a disability expressed increased feelings of openness to peers with ASD, were more accepting and had greater knowledge of ASD. Similar findings were replicated with a classroom-level intervention with 4th through 6th graders (Mavropoulou & Sideris, 2014). Another study with middle school students found that those that reported prior

awareness of ASD also received higher scores on an ASD knowledge questionnaire (Campbell & Barger, 2010).

However, not everyone has a relative or contact with a person with ASD, therefore it is important to evaluate knowledge in general peer populations. A study conducted by Tipton and Blacher (2013) evaluated scores on the Autism Awareness Survey of undergraduate students, graduate students, staff, and faculty at a large university. The majority of participants were able to correctly identify certain aspects of ASD, (e.g., they should receive special education services, no one intervention works for all people with ASD, ASD can be diagnosed as early as 18 months); however, those with correct scores on certain questions, such as autism is increasing, also gave incorrect responses regarding the reason for the increase (i.e. vaccines cause autism; Tipton & Blacher, 2013). Similar results were found when evaluating the knowledge of ASD in middle school populations (Campbell & Barger, 2010; Campbell et al., 2011). Campbell and Barger (2010) explored middle school students' knowledge of autism. Results were varied with the lowest number of correct responses being regarding gaze aversion in ASD and the highest number of correct responses regarding the inability to catch ASD (Campbell & Barger, 2010).

To further identify common conceptions of ASD by middle school students, Campbell and colleagues (2011) investigated the content and accuracy of spontaneously generated responses about ASD by middle school students. About 71.3% of the students provided an accurate definition of autism, mainly identifying it as a disability, a smaller percentage were able to identify a core symptom such as impaired communication (8.4%), social deficits (8.2%), or restrictive, repetitive behaviors (1.6%), and in total only 2.5% were able to identify multiple core symptoms of autism (Campbell et al., 2011). It's then important to provide education to peers of students with ASD to amend these gaps in knowledge.

Sasson and colleagues (2017) found that neurotypical adults rated adults with ASD as more awkward, less approachable, and less likely for the neurotypical adult to pursue friendship (Sasson et al., 2017. Taking into consideration that even highly educated adults have misconceptions about ASD (Tipton & Blacher, 2013), it is important to look at how children and adolescents conceptualize ASD, and ways in which gaps in knowledge can be alleviated. In 1980, Bibace and Walsh developed a model of children's understanding of illness based on Piaget's cognitive theory; these stages involve a conception of illness as caused by some magical contagion, typically occurring from ages 2 to 6 years old, then from 7 to 10 years old children understand illness as being the result of some contaminate, then after age 11, children will begin to form the more complex physiological basis of illness, and eventually psychophysiological origins of illness (Vacik et al., 2001; Campbell & Barger, 2010). It is also possible that misinformation about ASD may yield misattribution as explained by attribution theory. When applied to ASD, attribution theory suggests that people may perceive autism-related behaviors as intentional unless provided with an appropriate explanation (Campbell, 2006). Attributing autism-related behaviors as intentional may lead to negative emotional responses and social distancing (e.g., Campbell, 2006). When considering these developmental stages of illness conceptualization and the possibility that behaviors are being attributed to someone with ASD as intentional, it would be vital to provide explanatory information about the behaviors that students with ASD exhibit.

Outcomes for Explanatory Messages

However, the results regarding the effectiveness of explanatory information about ASD have found variable support. Explanatory information refers to facts about typical symptoms of ASD, including restricted behaviors, deficits in social skills, and difficulty in communication.

Swaim and Morgan (2001) found that providing information did not affect ratings of attitude and behavioral intentions in elementary school students. However, for middle school students provided with explanatory information about ASD, they reported increased behavioral intentions towards peers with ASD as well as increased knowledge about ASD, but not significantly more knowledge than providing no information at all (Campbell, 2007). Whereas a study conducted by Ranson and Byrne (2014) found significant improvement in eighth-grade girls' knowledge, attitudes, and behavioral intentions towards female peers with ASD. In contrast, a prior study with younger students found the combination of explanatory and descriptive information had a positive effect on attitudes and behavioral intentions towards a hypothetical peer with ASD; this was dependent on grade (Campbell et al., 2004). That same study also found that explanatory information improved academic behavioral intentions, but only in girls (Campbell et al., 2004). Morton and Campbell (2007) also found that grade and source of information interact, with fifth graders responding more favorably, both in cognitive attitudes and behavioral intentions, when information about ASD was provided by a professional instead of a relative of a hypothetical student. It is also unclear whether gains from providing peers with explanatory information is maintained over time. Two studies investigating the effectiveness of the Kit for Kids lesson showed variable results. While Campbell and colleagues (2019) found improvements in knowledge of ASD and attitudes towards ASD for students with no prior awareness at two separate points of data collection, Caldwell (2019) found that there were initial gains in feelings of self-efficacy after receiving the Kit for Kids intervention, but not at follow-up. Interestingly, providing information about ASD diagnosis has shown to be more robust in the literature for adults (Iobst et al., 2009; Brosnan & Mills, 2016; Sasson & Morrison, 2019; Stern & Barnes, 2019).

A meta-analysis investigating the effectiveness of different message types from studies across different age ranges found a small, negative effect of explanatory information while combined descriptive and explanatory information showed a small, positive effect (Lochner, 2019). A recently conducted scoping review found there to be a wide variety in terms of current ASD educational interventions for neurotypical peers that differ in length, methodology, and group size (Cremin et al., 2020). Common elements of these programs are the use of both explanatory and descriptive information and higher rates of intervention success in older student populations (Cremin et al., 2020). Since the current literature regarding the impact explanatory information about ASD has on typical developing peers' knowledge, attitudes, and behavioral intentions is inconclusive, it warrants further investigation.

Impact of Gender of Student with Autism Spectrum Disorder

It is worth noting that with few exceptions, the previous studies focus on interventions that impact peers' attitudes and intentions towards boys with ASD. However, little is known about how girls with ASD are viewed by their peers or even if they present with different symptomology and behaviors compared to boys with ASD. As mentioned before, more commonly boys are diagnosed with ASD (APA, 2013), but this varies based on the severity of symptoms, with there being less of a gender discrepancy in more severe presentations (Holtmann et al., 2007; Lai et al. 2011). There are differing theories on why this gender discrepancy exists including girls with mild to moderate ASD being able to camouflage their symptoms (Dean et al., 2017) to suspected gender bias of diagnostic instruments (Lai et al., 2011; Dworzynski et al., 2012) to actual differences in ASD presentation between the genders (Holtmann et al., 2007; Hsaio et al., 2013).

One theory is the Extreme Male Brain theory, which states that ASD is due to an extreme sex difference in brain patterns where 'empathizing' is lower and 'systemizing' is higher which produces behaviors associated with ASD (Baron-Cohen & Wheelwright, 2003; Lai et al., 2011; Tan et al., 2015). However, this theory has been scrutinized and yielded mixed results. Baron-Cohen and Wheelwright (2003) examined gender differences regarding scores on the Friendship Questionnaire, which showed women had significantly higher scores than men and the neurotypical sample had significantly higher scores than adults with ASD. However, the researchers did not address unequal gender ratios, respective to groups, where the neurotypical group consisted of mostly women and the ASD group mostly consisted of men. Another study also investigated this theory by having undergraduates rate facial features and voice samples of adults with high and low scores on the Autism-spectrum Quotient (Tan et al., 2015). Results were mixed (Tan et al, 2015). Women scoring high on AQ had their faces rated as less feminine but not their voices and the opposite was found for men with high AQ scores, who were reported as having more feminine voices but not faces (Tan et al., 2015). Similarly, mixed results were found regarding adults with ASD and caregivers' ratings of ASD symptoms (Lai et al., 2011). Results showed no gender differences regarding scores on self-reported 'empathizing' or 'systemizing' nor on childhood severity, yet women reported more sensory-related systems throughout their life, fewer socio-communication difficulties, and more self-report of traits associated with ASD (Lai et al., 2011). While Extreme Male Brain theory may not have robust support, Lai and colleagues (2011) research suggests that there may, in fact, be some gender differences in the presentation of ASD symptomology. Supporting this assertion, a recent meta-analysis found similar severity in ASD symptomology in both men and women, but men more

frequently exhibited restrictive and repetitive behaviors than women with ASD (Chen et al, 2020).

These diagnostic and behavioral differences may lead to differential perceptions by typical peers of boys and girls with ASD. For example, Head and colleagues (2014) found that parents of 10- to 16-year-old children with and without ASD rated girls, independent of diagnosis, higher than boys on the Friendship Questionnaire. Interestingly, parents rated girls with ASD similarly to typically developing boys on the Friendship Questionnaire (Head et al., 2014), suggesting that girls with ASD may not exhibit deficits in social functioning relative to boys, but they do when compared to other typically developing girls. Other studies have found similar results regarding playground engagement (Dean et al., 2017) and scripted interviews (Sedgewick et al., 2016). This lends further evidence indicating girls with ASD may experience different social impairments related to friendships and social interactions compared to boys with ASD. Intriguingly, this may change over time. For example, Hsaio and colleagues (2013) investigated social impairments of traits associated with ASD in girls and boys in Grades 1 through 8. Higher ASD-related behaviors were associated with negative peer relationships, behavior problems at school, and problematic peer interaction, but the effects were moderated by both age and gender (Hsaio et al., 2013). Research conducted with adolescents with ASD found that while both boys and girls show similar theory of mind skills, however, girls engaged in more social reciprocity as a form of camouflage (Wood-Downie et al, 2020). Social deficits were more strongly related to negative peer relationships and school social problems in boys compared to girls, but social deficits had a stronger association with problems in peers in older girls compared to older boys or younger children (Hsaio et al., 2013). This suggests that as girls start to age, ASD-like behaviors become more pronounced or noticeable and impact their peer relationships.

Although some of these studies discuss how factors such as peer gender, knowledge, and gender of a student with ASD interact, there is still limited literature on the subject, specifically regarding children and adolescents. Male teachers in special education had significantly more positive attitudes towards students with ASD (Park & Chitiyo, 2011), suggesting that explanatory or increased knowledge of ASD might improve attitudes but only for men. This is contrary to the findings of Ranson and Byrne (2014) that found an anti-stigma program was effective in improving the attitudes of girls towards their female peers with ASD. Similarly, Andou and Kitamura (2013) found that females associated more severe psychological symptomology with female characters in vignettes which portrayed depression, and males associated more severe somatic symptomology with male characters in vignettes which portrayed depression. Also, there is almost no literature on peer perceptions of girls with ASD. Sasson and colleagues (2017) found that raters of both genders rated women with ASD more favorably, but only two women with ASD were used as stimulus participants in the study. These studies suggest that there may be an interaction of peer gender and gender of a hypothetical student with ASD as well as an interaction between gender of peer and intervention effectiveness.

Considering Self-Efficacy as an Outcome

Furthermore, the majority of the literature focuses on knowledge and attitudes. Very few studies investigate individuals' feelings of self-efficacy towards their peers with ASD. According to Bandura's theory of self-efficacy (1997), belief in one's capability to perform a task increases one's success in accomplishing or performing that task. It is then reasonable to suspect that self-efficacy could be an indicator of peer interventionists' intentions and effectiveness in that role. Caldwell (2019) found that elementary school students' self-efficacy and attitudes towards

students with ASD are positively correlated. Teachers' feelings of self-efficacy in working with students with ASD predicted where they placed those students (Segall & Campbell, 2014). Bandura (1997) also notes that efficacious beliefs are imperative to the cognitive regulation of motivation. This suggests that self-efficacy may be a better indicator of the behavioral intentions of people towards students with ASD.

When considering self-efficacious beliefs, it is also important to discuss the sources of self-efficacy. Bandura (1997) states that the sources of self-efficacy are master experiences, vicarious experiences, social persuasion, and states of physiological arousal. Caldwell (2019) found that vicarious experiences and physiological states were significant predictors regarding feelings of self-efficacy in elementary students. Another study found that, in adolescents, social persuasion often diminishes their feelings of self-efficacy regarding peer interactions (Nyman et al., 2019). Another study found that positive social persuasion (friend support) in those with low feelings of self-efficacy facilitated intentions (Hamilton et al., 2017). It is important then to consider targeting these sources of self-efficacy in order to encourage higher feelings of self-efficacy in peers of students with ASD.

It is essential to discuss that demographic factors may influence feelings of self-efficacy. For example, Beghetto and colleagues (2011) found self-efficacious beliefs decreased with grade-level. In addition to grade, gender could influence self-efficacious beliefs, specifically in adolescence (Sing & Udainiya, 2009; Kumar & Lal, 2006; Bacchin & Maliulo, 2003). However, Lochner (2019) states that there are no gender differences regarding intervention effectiveness. This in combination with Caldwell's (2019) findings that interventions can be effective in increasing elementary students' feelings of self-efficacy towards peers with ASD, self-efficacious beliefs may be a good target for intervention and research.

Purpose of the Present Study

With these considerations in mind, this study aims to investigate the influence gender and explanatory information of ASD has on peers' attitudes and feelings of self-efficacy in being a peer interventionist for students with ASD. The purpose of the present study is to investigate the effects of gender and explanatory information on middle school students' (a) attitudes towards peers with autism and (b) their own feelings of self-efficacy in serving as a peer buddy for a student with ASD. Based on the current literature, research questions and hypotheses are as follows:

Research Question 1. Do ASD student gender, student gender, and presence of explanatory information interact to affect students' attitudes toward a peer with ASD?

Hypothesis 1a. There will be a main effect of student's gender on CATCH-7 scores. Girls, overall, will have more favorable attitudes towards the student with ASD.

Hypothesis 1b. There will be a significant interaction with the hypothetical student with ASD's gender and explanatory information for all students. Overall, students will have more favorable attitudes towards girls with ASD, especially with the presence of explanatory information.

Hypothesis 1c. There will be a significant interaction with the hypothetical student with ASD's gender and student gender. Girls will report more favorable attitudes overall but have more positive attitudes towards a girl with ASD than a boy with ASD. Boys will endorse more favorable attitudes towards a male peer with ASD than a female peer with ASD.

Hypothesis 1d. There will be a significant interaction of gender of participant and the presence of explanatory information. Girls will have more favorable attitudes towards the student in the vignette, especially when explanatory information is present.

Research Question 2. Do ASD gender, student gender, and presence of explanatory information interact to affect students' self-efficacy about serving as a peer buddy for a student with ASD?

*Hypothesis 2a***.** There will be a main effect of explanatory information. Having explanatory information will increase feelings of self-efficacy in working with a peer with ASD**.**

Hypothesis 2b. There will be a main effect of student gender. Girls will experience higher feelings of self-efficacy in their ability to provide support to a hypothetical student with ASD.

Hypothesis 2c. There will be a significant interaction of student gender and the presence of explanatory information. Girls will experience higher feelings of self-efficacy in their ability to provide support to the hypothetical student with ASD, especially when explanatory information is present.

Hypothesis 2d. There will be a significant interaction of the hypothetical student with ASD's gender and student gender. Girls will experience higher feelings of self-efficacy in their ability to provide support to a student with ASD, especially when the student with ASD is a girl.

Hypothesis 2e. There will not be an interaction between ASD gender and the presence of explanatory information on self-efficacious beliefs.

Research Question 3. Do sources of self-efficacy relate to self-efficacious beliefs about providing support to hypothetical students with ASD?

*Hypothesis 3***.** All four sources of self-efficacy (mastery experience, vicarious experience, social persuasion, and states of physiological arousal) will each uniquely predict participants' scores of self-efficacious beliefs.

CHAPTER TWO: METHODS

Participants

Participants were recruited from students in the 6th, 7th, and 8th grades at School 1 and School 2. Consents were sent to parents of students in the aforementioned grades via school administrative systems and students completed assents to participate in the study. Both schools are rural, public schools located in Jackson County, North Carolina. School 1 is a public middle school that is operated by Western Carolina University and involves the use of innovative teaching approaches (Western Carolina University, 2020). School 1 is predominantly Caucasian (88%) and male (58%) with approximately 60 students in attendance (GreatSchools, 2020). School 2 is a public school with grades Kindergarten through 8th grade (ElementarySchools, 2020). School 2 is also predominately Caucasian (80%) and male (52%) with approximately 300 students in the 6th, 7th, and 8th grade (ElementarySchools, 2020).

Materials

A demographic questionnaire was developed for this study (Appendix A; Campbell et al. 2019). Participants completed a demographic questionnaire prior to the other measures. Demographic data was collected regarding age, ethnicity, gender, teacher's name, and grade.

Vignettes

Vignettes were developed for this study (Appendix B-E; Segall & Campbell, 2014). The vignettes describe a fictional student and exhibit symptoms and behaviors that are characteristic of ASD, according to the Diagnostic and Statistical Manual of Mental Disorder, 5th Edition (APA, 2013). The vignettes differ based on the hypothetical student's gender (male or female) and the presence or absence of explanatory information about ASD.

Knowledge of Autism (KOA)

The Knowledge of Autism (KOA) scale was used to determine students' knowledge of the symptomology and etiology of autism spectrum disorder (see Appendix F). The measure consists of 16 true-false questions related to common myths and accurate information about autism (Caldwell & Campbell, 2019). The KOA has an internal consistency of $\alpha = .58$ (Campbell et al., 2019).

Chedoke-McMaster Attitudes towards Children with Handicaps (CATCH-7)

The Chedoke-McMaster Attitudes towards Children with Handicaps (CATCH-7) was used as a measure of students' attitudes toward individuals with disabilities. The original CATCH contained 36-items, 12 items for each facet of attitude (cognitive, behavioral intentions, and affective) assessing children aged 8 to 13 years old with an internal consistency of $\alpha = .90$ and test-retest reliability coefficient, $r = .70$ (Vignes et al., 2008). The CATCH-7 has shown to be a reliable short form of the measure with the internal consistency of $\alpha = .88$ (Bossaert & Petry, 2013). The questions are answered on a 5-point Likert-type scale from "No, definitely not" to "Yes, definitely." The CATCH-7 had been found to be reliable and valid for middle school students (Vignes et al., 2008; Bossaert & Petry, 2013). The CATCH-7 was modified for this study to reflect the name of the fictional student in the vignettes and the appropriate pronouns for the fictional student (see Appendix G).

Self-Efficacy toward Autism Questionnaire (SETAQ)

The Self-Efficacy toward Autism Questionnaire (SETAQ) was designed to measure typically developing students perceived self-efficacy in assisting the hypothetical peers with ASD (Caldwell, 2014). The SETAQ was modified for this study to include the name of the fictional student in the vignettes and the appropriate pronouns to match the vignettes (see

Appendix H). This measure consists of 16-questions, which ask whether or not peers are able or feel capable to complete a variety of tasks for a student with autism. The questions are answered on a 5-point Likert-type scale from "No, definitely not" to "Yes, definitely." A previous study showed good internal consistency to be $\alpha = .90$ (Caldwell & Campbell, 2019).

Sources of Self-Efficacy Towards Autism Spectrum Disorders Scale (SSETASD)

The Sources of Self-Efficacy Towards Autism Spectrum Disorder Scale (SSETASD) was developed to measure sources of self-efficacy of typically developing middle school students in interacting with peers with ASD (Caldwell & Campbell, 2019). It was modified for this study (see Appendix I). This measure is used to determine what sources (e.g., master experiences, vicarious experiences, social persuasions, or emotional and physiological states) give them a sense of ability to work with a student with autism (Usher & Parajes, 2008; Caldwell & Campbell, 2019). The SSETASD has been shown to be reliable ($\alpha = .82$-$.94$ for subscales; Caldwell, 2019). This measure was selected to provide information on what sources of self-efficacy are most influential in shaping middle school students' beliefs and own feelings of self-efficacy.

All measures and vignettes were vetted by ASD experts for content and middle school students to ensure age appropriateness. Feedback involved clarification of demographic questions and inclusion of less complex wording in the explanatory information condition. These adjustments were made, and readability was determined to be at a 6^{th}-grade level.

Procedure

Students whose parents provided consent were randomly assigned to one of four vignette conditions: (a) male peer with autism and no explanatory information about ASD present, (b) female peer with autism with no explanatory information about ASD present, (c) male peer

explanatory information about ASD present and (d) female peer with explanatory information about ASD present. For School 1, the participants were randomly assigned to a condition, then taken out of class and randomly assigned to groups in other classrooms. Participants then were provided with an assent form and informed that they will "hear about a fictional student and be asked to answer some questions about the student." Once assent was obtained, the participants completed demographic information as well as a question regarding whether or not they have heard of autism. After completing the demographic questionnaires, students were provided with a vignette for their assigned condition about a hypothetical student. A graduate student read the vignette to participants. After reading the vignettes, participants responded to the KOA, CATCH-7, SETAQ, and SSETASD. This was implemented as a manipulation check to ensure appropriate explanatory information was provided when autism is disclosed, their attitudes towards individuals with autism, and their thoughts on how well they would work with students with autism if selected as a peer buddy. Due to the COVID-19 pandemic, the administration was amended to be administered online via Zoom with the assistance of a school counselor for School 2.

Data Analysis Plan

Using IBM SPSS Statistic 25 (IBM Corp., 2017), two 2 x 2 x 2, factorial ANOVAs were conducted to answer research questions 1 and 2. The ANOVAs consisted of a 2 (Vignette Gender: Male, Female) x 2 (Student Gender: Male, Female) x 2 (Explanatory Information Present, Absent) between subjects factors for both CATCH-7 and SETAQ scores. Multiple regression was conducted using IBM SPSS Statistic 25 (IBM Corp., 2017), to determine the predictive value of each source of self-efficacy on self-efficacious beliefs, controlling for student gender, and condition (ASD gender, presence or absence of explanatory information).

The dependent variables for the respective ANOVAs were the CATCH-7 scores and SETAQ scores. Follow-up analysis included subsequent *t* tests comparing CATCH-7 scores for gender vignette groups, SETAQ scores for gender vignette groups, CATCH-7 scores for explanatory information about autism groups, and SETAQ scores for explanatory information about autism groups.

Power analysis

A priori power analyses were conducted for fixed effect ANOVAs using G*Power 3.1.9.4 (Faul et al., 2009). Effect sizes were based on findings from Caldwell (2019), which examined sources of self-efficacy on the SETAQ scores (R^2= 0.43-0.61) as well as from Campbell et al. (2019) that provided effects for the impact of gender on KOA and CATCH-7 scores (β=0.44), and Campbell et al. (2004) that provided effect sizes for the impact of gender (*d* =0.47) and explanatory information (combined with descriptive information; *d* =0.24) on KOA scores. In order to detect a small effect, a sample size of 580 is required. To detect a medium effect, a sample size of 210 is required. Based on the selected sites, an expected sample size of 300 would have provided 73% power. However, due to difficulties with recruitment during the COVID-19 pandemic, participant enrollment was significantly hampered. As such, the study is significantly underpowered to detect small to medium effect.

CHAPTER THREE: RESULTS

Participants

Participants were recruited from two local middle schools in Western North Carolina. The majority of participants were sixth graders (e.g., 76.7% of the sample) and identified as Caucasian (e.g., 72.7% of the sample). The sample also consisted of approximately male (42.4%)

and female (57.6%) participants (See Table 1). Inconsistent with prior studies (Campbell & Barger, 2014), most of the sample, 82.8%, reported that they had heard of ASD. This may be due to volunteer bias, especially given recruitment concerns during the COVID-19 pandemic. There was a relatively even distribution of participants (Condition B, $n = 7$; Condition C, $n = 10$; Condition A, $n = 10$; Condition D, $n = 6$) to each condition with slightly underrepresentation in the condition with the vignette character as a girl and includes ASD disclosure. Of the participants in Condition B, 85.7% reported their race as White and being in 6th grade, and 71.4% self-identified as a girl. For participants in Condition C, 70% reported their race as White and as 6th graders, and 50% self-identified as a girl. Of the participants in Condition A, 60% reported being in 6th graders and self-identified as a girl, and 70% reported their race as White. For the participants in Condition D, 66.7% reported being in 6th grade and their race as White, and 50% self-identified as a girl. Chi-square analyses were conducted to determine if autism knowledge and gender were equally represented across conditions. The proportion of participants who reported knowledge of autism did not differ by gender, χ^2 (1, N = 33) = 1.21, $p = 0.27$. There was not a significant relationship between these two variables. Female and male students were equally exposed to differing vignette gender, χ^2 (1, N = 33) = 0.02, $p = 0.88$. A chi-square test of independence showed there was no significant association between participant's gender and exposure to explanatory information of autism, χ^2 (1, N = 33) = 0.14, $p = 0.71$.

Reliability

The researcher calculated Cronbach's α for the CATCH-7, KOA, SETAQ, and SSEASSD to determine internal consistency reliability. Similar to previous reports (Bossaert & Petry, 2013), the CATCH-7 was shown to have acceptable reliability ($\alpha = 0.86$). Likewise, the KOA had low internal consistency ($\alpha = 0.52$) similar to previous studies (Campbell et al., 2019).

While this shows lower internal consistency, it is likely due to the structure of the items, which are all true-false. The SETAQ also had good internal consistency ($\alpha = 0.90$) that similar to previous reports (Caldwell & Campbell, 2019). Previously the SSETASD has been shown to be reliable (Caldwell, 2019), and findings from the current sample support good internal consistency for the SSETASD ($\alpha = 0.91$). The Mastery of Experience subscale of the SSETASD also showed good internal consistency ($\alpha = 0.86$), as did the subsequent subscales of the SSETASD: Vicarious of Experience was acceptable ($\alpha = 0.78$), Social Persuasion was good ($\alpha = 0.88$), and Physiological States was acceptable ($\alpha = 0.72$).

Proposed analyses

The sample was small; thus, a Shapiro-Wilk test was conducted to determine whether scores on the KOA, CATCH-7, SETAQ, and SSETASD met normality assumptions. The KOA total scores were significantly non-normal for this sample, $W(32) = 0.82$, $p < 0.01$. A Shapiro-Wilk test showed that CATCH-7 total scores also departed significantly from normality, $W(32) = 0.91$, $p < 0.05$. The total scores observed on the SETAQ significantly differed from normality, $W(32) = 0.79$, $p < 0.01$. A Shapiro-Wilk tests also showed that total scores on the SSETASD were significantly different from normality, $W(32) = 0.92$, $p < 0.05$.

Hypothesis 1a. A main effect of hypothetical student's gender on CATCH-7 scores was not observed, $F(1, 33) = 0.59$, $p = 0.45$, partial $\eta^2 = 0.02$. There was not a significant difference between students' attitudes towards the student in the vignette.

Hypothesis 1b. There was not a significant interaction between the hypothetical student's gender and explanatory information for all students, $F(1, 33) = 1.43$, $p = 0.24$, partial $\eta^2 = 0.05$. Overall, students did not have more favorable attitudes towards girls with ASD, especially with the presence of explanatory information.

Hypothesis 1c. There was not a significant interaction with the hypothetical student with ASD's gender and student gender, $F(1, 33) = 1.84$, $p = 0.19$, partial $\eta^2 = 0.07$. Girls did not report more favorable attitudes overall nor have more positive attitudes towards a girl with ASD than a boy with ASD. This was likely not detected because of the small sample size. Boys did not endorse more favorable attitudes towards a male peer with ASD than a female peer with ASD.

Hypothesis 1d. There was not a significant interaction of participant gender and the presence of explanatory information, $F(1, 33) = 0.02$, $p = 0.90$, partial $\eta^2 = 0.00$. Girls did not have more favorable attitudes towards the student in the vignette, even when explanatory information is present.

Hypothesis 2a. A main effect of explanatory information on self-efficacious beliefs was not observed, $F(1, 33) = 0.00$, $p = 0.99$, partial $\eta^2 = 0.00$. Having explanatory information did not increase feelings of self-efficacy in working with a peer with ASD**.**

Hypothesis 2b. There was not a main effect of student gender on self-efficacious beliefs, $F(1, 33) = 0.04$, $p = 0.84$, partial $\eta^2 = 0.00$. Girls did not experience higher feelings of self-efficacy in their ability to provide support to a hypothetical student with ASD.

Hypothesis 2c. There was not a significant interaction of student gender and presence of explanatory information, $F(1, 33) = 0.16$, $p = 0.69$, partial $\eta^2 = 0.01$. Girls did not exhibit higher feelings of self-efficacy in their ability to provide support to the hypothetical student with ASD, especially when explanatory information is present.

*Hypothesis 2d***.** There was not a significant interaction of the hypothetical student's gender and participant gender, $F(1, 33) = 0.09$, $p = 0.77$, partial $\eta^2 = 0.00$ Girls did not exhibit

higher feelings of self-efficacy in their ability to provide support to a student with ASD, even when the student with ASD was a girl.

*Hypothesis 2e***.** As predicted, the interaction of ASD gender and presence of explanatory information did not significantly impact self-efficacious beliefs, $F(1, 33) = 0.38$, $p = 0.55$, partial $\eta^2 = 0.02$.

Hypothesis 3. Hierarchical multiple regression analysis was used to assess the relationship between scores reported on the SETAQ and scores reported on the SSETASD while controlling for student gender, vignette gender, and presence or absence of an explanatory message. The first step accounted for 14% of the variance, $R^2 = 0.14$, $F(3, 28) = 1.47$, $p = 0.25$. In this first step, student gender was not significantly associated with self-efficacy, $B = 1.67$, $\beta = 0.12$, $t(28) = 0.68$, $p = 0.50$. Vignette gender was also not significantly associated with self-efficacy, $B = 4.79$, $\beta = 0.36$, $t(28) = 2.01$, $p = 0.054$, nor was the presence or absence of explanatory information, $B = 0.66$, $\beta = 0.05$, $t(28) = 0.26$, $p = 0.79$. Sources of self-efficacy accounted for 56% of the variance, $R^2 = 0.56$, $F(7, 24) = 4.33$, $p < 0.01$. In this second step, mastery experiences was not significantly associated with higher feelings of self-efficacy, $B = 0.24$, $\beta = 0.19$, $t(24) = 0.76$, $p = 0.45$. Vicarious experiences were also not significantly associated with self-efficacy, $B = 0.98$, $\beta = 0.07$, $t(24) = 0.45$, $p = 0.66$, nor was social persuasion, $B = 0.04$, $\beta = 0.05$, $t(24) = 0.22$, $p = 0.82$. Physiological states were negatively and significantly associated with a higher feelings of self-efficacy, $B = 0.62$, $\beta = 0.40$, $t(24) = 2.14$, $p < 0.05$, such that lower physiological arousal was associated with higher feelings of self-efficacy.

Supplementary Analyses. Two-way ANOVAs were conducted to assess the impact of prior knowledge of autism, presence or absence of explanatory information, and their potential interaction on CATCH-7, KOA, and SETAQ total scores. A main effect of prior knowledge of

autism on CATCH-7 total scores was not observed, $F(1, 33) = 3.44$, $p = 0.07$, partial $\eta^2 = 0.11$, nor was a main effect of presence of explanatory information on CATCH-7 scores observed, $F(1, 33) = 3.19$, $p = 0.08$, partial $\eta^2 = 0.10$. It is possible to speculate that this may have been significant provided power from a larger sample. There was not a significant interaction between prior knowledge of autism and presence of explanatory information on CATCH-7 scores, $F(1, 33) = 1.78$, $p = 0.19$, partial $\eta^2 = 0.06$.

A main effect of prior knowledge of autism on SETAQ total scores was observed, $F(1, 33) = 6.53$, $p < 0.05$, partial $\eta^2 = 0.18$. A main effect of presence of explanatory information on SETAQ scores was not observed, $F(1, 33) = 0.95$, $p = 0.34$, partial $\eta^2 = 0.03$. There was not a significant interaction between prior knowledge of autism and presence of explanatory information on SETAQ scores, $F(1, 33) = 2.38$, $p = 0.13$, partial $\eta^2 = 0.08$.

A main effect of prior knowledge of autism on KOA total scores was not observed, $F(1, 33) = 3.40$, $p = 0.08$, partial $\eta^2 = 0.11$. Nor was a main effect of presence of explanatory information on KOA scores observed, $F(1, 33) = 2.45$, $p = 0.13$, partial $\eta^2 = 0.08$. There was not a significant interaction between prior knowledge of autism and presence of explanatory information on KOA scores, $F(1, 33) = 0.00$, $p = 0.97$, partial $\eta^2 = 0.00$.

Non-parametric analysis. Due to the non-normality of dependent variables, non-parametric analyses were conducted. For participants who provided responses to all items on the KOA, CATCH-7, SETAQ, SSETASD (n =32 of 33; 97%), differences in total scores for the KOA, CATCH-7, SETAQ, and SSETASD were examine for the different vignette conditions. Mann-Whitney test (U) to compare participants that read a vignette about a girl with ASD (n = 15) and those that read a vignette about a boy with ASD (n = 17). Mann-Whitney test (U) to

compare participants that read vignettes with (n = 12) or without (n = 20) explanatory information about ASD.

Knowledge scores did not differ for students who read a vignette about a girl with ASD (*Mdn* = 13.00) and students who read a vignette about a boy with ASD (*Mdn* = 13.00), U = 93.50, z = -1.35, p = 0.20, r = -0.24. Overall attitude scores did not differ for students who read the vignettes about a girl with ASD (*Mdn* = 26.00) and students who read a vignette about a boy with ASD (*Mdn* = 22.00), U = 78.00, z = -1.79, p = 0.06, r = -0.33. Students who read the vignettes about a girl with ASD (*Mdn* = 62.00) reported feeling more capable of acting as a peer support compared to students who read the vignettes about a boy with ASD (*Mdn* = 58.00), U = 75.50, z = -1.98, $p < 0.05$, r = -0.35. However, students who read the vignette about a girl with ASD (*Mdn* = 102.00) and students who read the vignette about a boy with ASD (*Mdn* = 99.00) did not differ significantly on the sources of these self-efficacious beliefs, U = 94.00, z = -1.27, p = 0.22, r = -0.22.

Knowledge scores did not differ for students who received explanatory information about ASD (*Mdn* = 13.00) and students who did not receive explanatory information about ASD (*Mdn* = 13.00), U = 82.00, z = -1.55, p = 0.15, r = -0.27. Overall attitude scores also did not differ between the group that received explanatory information about ASD (*Mdn* = 24.00) and the group that did not (*Mdn* = 22.00), U = 93.50, z = -1.04, p = 0.31, r = -0.18. Likewise, students that received explanatory information about ASD (*Mdn* = 60.50) did not report significantly different feelings in their ability to support student with ASD compared to students who did not receive explanatory information about ASD (*Mdn* = 59.50), U = 113.00, z = -0.28, p = 0.80, r = -0.05. Similarly, the group that received explanatory information about ASD (*Mdn* = 99.00) and

the group that did not (*Mdn* = 91.50) did not differ significantly on the sources of these self-efficacious beliefs, $U = 100.50$, $z = -0.76$, $p = 0.45$, $r = -0.13$.

CHAPTER FOUR: DISCUSSION

The literature suggests that peer-mediated interventions and inclusive classrooms are an effective tool to help students with ASD to build quality friendships with their peers (Wong et al., 2015; Hume & Campbell, 2019). However, the effectiveness of peer-mediated interventions relies on the assumptions that these peers will harbor positive attitudes towards their peers with ASD. In order to improve peers' perceptions of students with ASD, researchers have investigated the use of explanatory information about ASD (Swaim & Morgan, 2001; Campbell et al, 2004; Campbell, 2007; Morton & Campbell, 2007; Campbell et al, 2019) under the assumption that improved knowledge may lead to improved attitudes. However, there is variable support that providing education on ASD improves peers' perceptions of students with ASD. Interestingly, strong evidence indicates that girls tend to have a more favorable attitude towards students with ASD (Bossaert et al., 2011; Campbell et al., 2004; Campbell, 2007; Campbell et al. 2019). One study also suggests that individuals have more favorable attitudes towards girls with ASD (Sasson et al, 2017). This study aimed to investigate whether these variables would interact and lead to students having a more favorable view of peers with ASD. However, recruitment was difficult during the COVID-19 pandemic, thus our sample was limited, which likely impacted the aforementioned results.

Summary of Main Findings

Our findings suggest there does not appear to be a significant effect of participant gender, gender of a student with ASD, and knowledge of ASD on adolescents' attitudes towards ASD or

their feelings of self-efficacy in acting as peer interventionists for students with ASD when considering it as a normative sample. However, results from nonparametric tests found that students did report feeling significantly more capable of supporting a girl with ASD. There was no interaction between participant gender, gender of a student with ASD, and knowledge of ASD observed. Likewise, three of the four sources of self-efficacy (Master Experience, Vicarious Experience, and Social Persuasion) were not found to significantly impact adolescents' self-efficacious beliefs acting as peer support for a student with ASD.

Interestingly, our findings did support the important impact of lower physiological states have on adolescents' self-efficacious beliefs about their ability to act as a peer interventionist. This indicates that adolescents who experience less hyperarousal around peers with autism also feel more capable of being a peer support for those students. This may mean that reducing anxiety may be a target intervention to improve middle schoolers perceptions about ASD and feel more capable as peer interventionists for students with ASD. These findings align with previous research with the SETAQ and SSETASD (Caldwell, 2019). Our findings also suggest that students' prior knowledge of ASD did positively influence students' self-efficacious beliefs about their ability to be a peer interventionist for a student with ASD. The results of this study are limited yet provide an initial framework on how to assess the influence of explanatory information about ASD and given characteristics of a student with ASD has on the attitudes and beliefs of their adolescent peers.

Implications of Findings

The results from this study found similar reliability as previous studies that used the KOA (Campbell et al, 2019), CATCH-7 (Vignes et al., 2008; Bossaert & Petry, 2013), SETAQ (Caldwell & Campbell, 2019), and SSETASD (Caldwell, 2019). This suggests that outside of the

CATCH-7, SETAQ, and SSETASD are reliable measures that can be used to assess students' attitudes, self-efficacious beliefs, and sources of self-efficacy. The findings from this study diverge from previous findings by Campbell and Barger (2010), since the gender of student participants did not predict more favorable attitudes towards their peers with ASD. Adding to the inconsistency of research related to the role of explanatory information on students' attitudes, or findings suggest it does not impact students' attitudes toward peers with ASD, which aligns with findings by Swaim and Morgan (2001) but not with findings by Campbell (2007). However, our findings did align with Caldwell's (2019) previous finding that explanatory information did not significantly impact students' own feelings to act as a peer interventionist as well as that heightened physiological states do impact their self-efficacious beliefs. Interestingly, this suggests that middle schoolers' self-efficacious beliefs about acting as a peer interventionist are more impacted by a heightened physical state than by increased knowledge of ASD.

Study Limitations

While this study did not find an impact of gender and ASD knowledge on peer attitudes and beliefs, it is not without several limitations. For example, due to the COVID-19 pandemic, it was difficult to recruit multiple schools in the area as well as individual participants. This inadequate sample size made it difficult to detect potentially significant effects. Additionally, the distribution of participants was not entirely even as there was an overrepresentation of participants in the conditions that involved the absence of explanatory information. Furthermore, data were collected with participants both in groups and in one-on-one sessions. This may have influenced participants to provide more favorable responses, especially when administered one-on-one with a researcher. In addition, vignettes were used to assess students' attitudes and beliefs about a student, thus they may not be an accurate representation as it is a fabricated

representation of a student with ASD and not an actual student with ASD. Also, while the CATCH-7 and SETAQ measure attitudes and self-efficacious beliefs, however, attitudes and self-efficacious beliefs do not equal actual behavior. Finally, the use of self-report questionnaires may also impact whether or not participants provided responses that were socially desirable and may impact their truthfulness in responding. This may mean that participants provided more favorable responses about their attitudes and behavioral intentions toward the hypothetical student with ASD, and would thus act differently should they interact with an individual with ASD. For this reason, it is difficult to determine whether the scores are generalizable to middle schoolers in classroom settings.

Future Research

While the sample size of this study was limited, future research should continue to investigate how gender and diagnostic disclosure impact peers' attitudes and self-efficacious beliefs about their ability to support students with ASD. It is important to examine whether other demographic characteristics (e.g., race, ethnicity) also impact students' attitudes and beliefs about students with ASD. Additionally, research should aim to investigate how sources of self-efficacy, especially physiological states, can influence peers' self-efficacious beliefs in their ability to support a peer as well as determine if interventions can be developed to target physiological states as a source of these self-efficacious beliefs. Future research should also include a more thorough investigation of the role gender plays in influencing the effectiveness of peer interventionists. For example, research should aim to measure changes in attitudes towards ASD of peers in different dyad pairs (e.g., boy supporting a girl with ASD, girl support a boy with ASD, boy supporting a boy with ASD, and girl supporting a boy with ASD) as well as

examine whether the gender of the peer interventionist has an impact on the effectiveness (e.g., increased social engagement, better quality friendships) for children and adolescents with ASD.

Conclusions

This study provides important preliminary information regarding how student gender, gender of their peers with ASD, and knowledge of ASD impact adolescents' attitudes towards ASD and belief in their own ability to support peers with ASD. However, the limitations of this study, including lack of sufficient power to detect effects, in addition to the lack of available research on how gender impacts attitudes towards students with ASD suggests that further research is warranted.

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Table 1. School Characteristics Sample

Variable	n	%
School (% School 2)	26	76.5
Gender (% female)	19	55.9
Race (% White)	24	70.6
Ethnicity (% Hispanic)	2	5.9
Age (% 12 years old)	13	38.2
Grade (% 6^{th} grade)	23	67.6
Knowledge of Autism (% yes)	28	82.4

Table 2. Pearson's Correlation Between Measures

Variable	Correlations		
	1	2	3
1. CATCH Total Score			
2. SETAQ Total Score	0.76**		
3. SSETASD Total Score	0.86**	0.65**	
4. KOA Total Score	0.18	0.35	0.22

*Notes. N*s = 33. * $p < 0.05$. ** $p < 0.01$, CATCH-7 = Chedoke-McMaster Attitudes towards Children with Handicaps; SETAQ = Self-efficacy toward Autism Questionnaire; SSETASD= Sources of Self-Efficacy Towards Autism Spectrum Disorders Scale; KOA= Knowledge of Autism.

Table 3. Factorial ANOVA effects of Student Gender, ASD Gender, and Explanatory Information Presence on Participants' CATCH scores

	F	*df*	*p*	η^2
CATCH Total Score				
Student Gender	0.59	1	0.45	12.62
ASD Gender	1.29	1	0.27	27.51
Explanatory Information	1.61	1	0.22	34.27
Student Gender x ASD Gender	1.84	1	0.19	39.19
Student Gender x Explanatory Information	0.02	1	0.90	0.33
ASD Gender x Explanatory Information	1.43	1	0.25	30.42
Student Gender x ASD Gender x Explanatory Information	0.06	1	0.81	1.25

Notes. CATCH-7 = Chedoke-McMaster Attitudes towards Children with Handicaps; ASD= Autism Spectrum Disorders.

Table 4. Factorial ANOVA effects of Student Gender, ASD Gender, and Explanatory Information Presence on Participants' SETAQ scores

	F	*df*	*p*	η^2
SETAQ Total Score				
Student Gender	0.04	1	0.84	2.15
Explanatory Information	0.00	1	0.99	0.00
ASD Gender	1.56	1	0.22	83.47
Student Gender x Explanatory Information	0.16	1	0.69	8.73
Student Gender x ASD Gender	0.09	1	0.77	4.59
ASD Gender x Explanatory Information	0.38	1	0.55	20.15
Student Gender x ASD Gender x Explanatory Information	0.01	1	0.93	0.43

Notes. SETAQ = Self-efficacy toward Autism Questionnaire; ASD= Autism Spectrum Disorders Scale.

Table 5. Regression Analysis Predicting Self-efficacy from Sources of Self-efficacy, When Controlling for Gender and Condition

	B	*SE*	β	*t*	*p*	R^2
Step 1						0.14
Student Gender	1.63	2.39	0.12	0.68	0.50	
ASD Gender	4.80	2.38	0.36	2.01	0.05	
Explanatory Condition	0.65	2.45	0.05	0.26	0.80	
Step 2						0.56
Mastery Experience	0.24	0.31	0.19	0.77	0.45	
Vicarious Experience	0.45	0.33	0.24	1.36	0.19	
Social Persuasion	0.04	0.17	0.05	0.22	0.82	
Physiological State	0.62	0.29	0.40	2.14	0.04*	

Note. Step 1: R^2 =.14 $F(3,28)$ =1.47, p = 0.25; Step 2: ΔR^2 =0.42, $F(4,24)$=4.31 , p < 0.05.

APPENDIX A: DEMOGRAPHIC AND AUTISM AWARENESS SURVEY

Grade: _____ **Age**: _____ **Birthdate**: _____

Teacher: _____ **Gender**:_____

Race (Check one): Caucasian/White_____ African-American_____ Asian-American_____ Native American or Pacific Islander_____ Multi-racial_____ Other (Write in Space) _____

Are you Hispanic/Latino (Check yes or no): **Yes** **No**

Have you ever heard of autism? (Circle one): **Yes** **No**

If yes, what is autism? Write your answer below:

_____

_____

_____

_____

APPENDIX B-E: STUDY VIGNETTES

Note. The sections in brackets differ based on vignette condition.

Next year, Riley may be joining your class. [He/She] is the same age as you and in the same grade. Sometimes when talking to Riley, [he/she] will repeat what you said to [him/her] without answering the question. Sometimes it might seem like Riley cannot hear or is not paying attention, but [his/her] hearing is normal. Riley almost never looks someone in the eye. Riley may not talk much to other students, but [he/she] may talk a lot about QR codes. At times, Riley will wave [his/her] hands. [He/She] will sometimes rock back and forth in [his/her] seat. Riley also has a hard time going from class to class and may not be able to go from one activity to the next in classes. [Riley isn't that different from you, except that [he/she] was born with autism, which means that there is something different about [his/her] brain that makes it hard for [him/her] to interact with other people and change routines.]

APPENDIX F: KNOWLEDGE OF AUTISM

We would like to know what you know about autism. Please answer the following questions using true or false. If you believe the statement is true, please circle **T**. If you believe the statement is false, please circle **F**. Even if you are not sure of the answer, please answer all the questions as best as you can.

T	F	1.	If someone has autism, it only lasts for about a week.
T	F	2.	Students with autism often have a difficult time looking at other people in the eyes.
T	F	3.	Autism does not affect a person's brain.
T	F	4.	Students with autism cannot do normal activities that other people can do, even with help from another person.
T	F	5.	Students with autism sometimes repeat what is said to them.
T	F	6.	Students with autism sometimes rock back and forth and wave their hands around.
T	F	7.	Some students with autism might have trouble talking or expressing themselves.
T	F	8.	Students with autism do not have difficulty changing activities and can easily move from one activity to another.
T	F	9.	Sometimes students with autism need extra help to learn how to read and write.
T	F	10.	You can catch autism by spending time with someone who has it, like you can catch a cold.
T	F	11.	Students with autism may like to do normal things like you—like dance to music or make art projects.
T	F	12.	Students with autism may like to only talk to you about one thing that they like
T	F	13.	Some students with autism might not talk much and might use different ways to tell you what they want to say
T	F	14.	Students with autism might get upset sometimes because their senses work differently than others
T	F	15.	Every kid with autism is different.

T	F	16.	Students with autism still want to be your friend even if they seem like they don't want to play with you.

APPENDIX G: CHILDREN'S ATTITUDES TOWARDS CHILDREN WITH HANDICAPS-7

ITEM SHORT FORM

If Riley moves to your school and is in your class, here is a list of things you might think about [her/him], feel about her/him, and might do with [her/him]. Remember, Riley is the [girl/boy] from the vignette you just read/was read to you. Circle the answer that shows how you feel about these things. For number 1, "I would feel good doing a school project with Riley." If you definitely agree with that statement, then circle the face with the biggest smile. If you definitely do not agree with that statement, then circle the face with the biggest frown. If you feel somewhere in between, then circle one of the other faces.

1. I would feel good doing a school project with Riley.

No, Definitely Not **Probably Not** **Maybe** **Probably** **Yes, Definitely**

2. I would like having Riley live next door to me.

No, Definitely Not **Probably Not** **Maybe** **Probably** **Yes, Definitely**

3. I would be happy to have Riley for a friend.

No, Definitely Not **Probably Not** **Maybe** **Probably** **Yes, Definitely**

4. I would be pleased if Riley invited me to his/her house.

No, Definitely Not **Probably Not** **Maybe** **Probably** **Yes, Definitely**

5. I would invite Riley to sleep over at my house.

No, Definitely Not **Probably Not** **Maybe** **Probably** **Yes, Definitely**

6. I would tell my secrets to Riley.

No, Definitely Not **Probably Not** **Maybe** **Probably** **Yes, Definitely**

7. I would enjoy being with Riley.

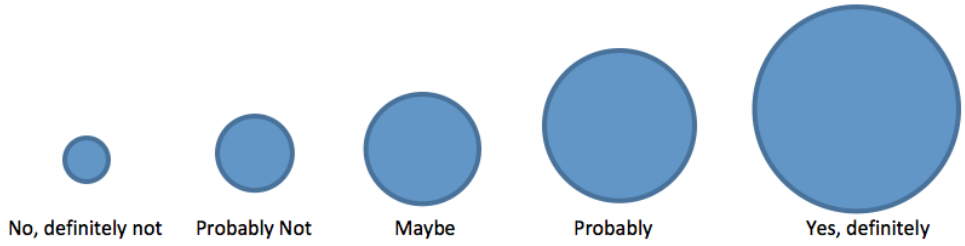
No, Definitely Not **Probably Not** **Maybe** **Probably** **Yes, Definitely**

APPENDIX H: SELF-EFFICACY TOWARD AUSTIM QUESTIONNAIRE

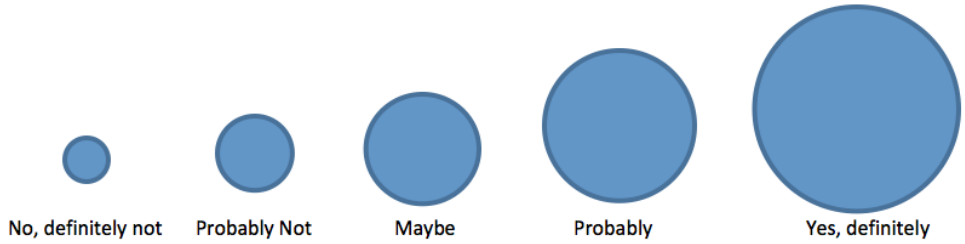
If Riley moves to your school and is in your class, here are some things you could do to help her/him get along in the classroom. Mark an "x" through the answer that shows how sure you are that you can do these things described below. For number 1, "I am sure that I can suggest things Riley and I can do together in a way she/he understands." If you feel sure you can do that, then mark an "x" through the biggest circle. If you feel sure you cannot do that, then mark an "x" through the smallest circle. If you feel somewhere in between, then mark an "x" through one of the other circles.

I am sure that I can…

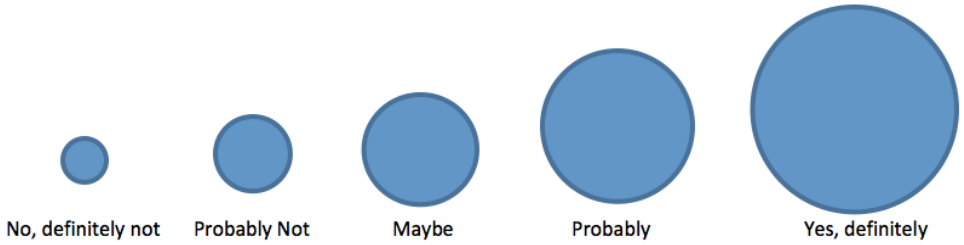
1. Suggest things Riley and I can do together in a way she/he understands



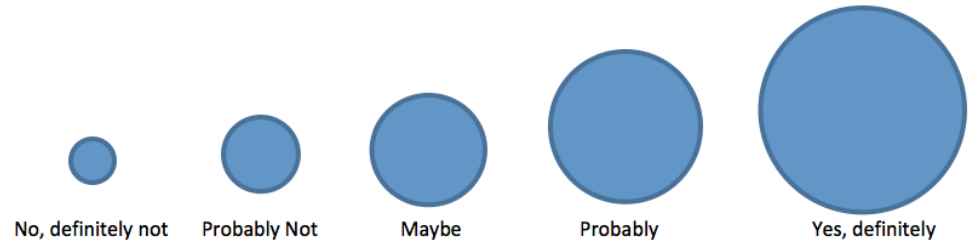
2. Ask my teacher for an idea that can work for Riley and me



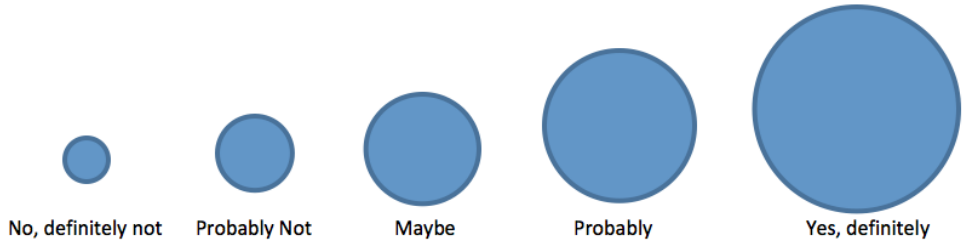
3. Suggest things I want to do sometimes too



4. Ask Riley to draw with me

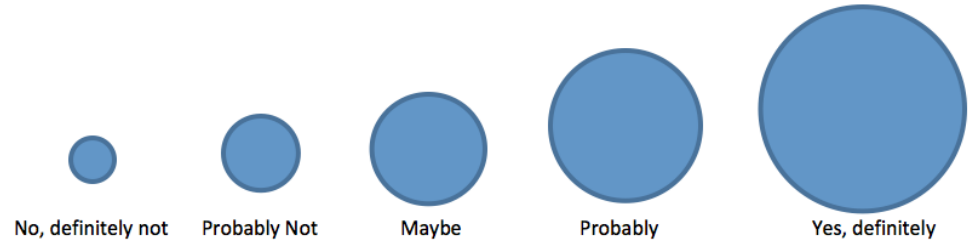


5. Talk to Riley when she/he doesn't look at my eyes

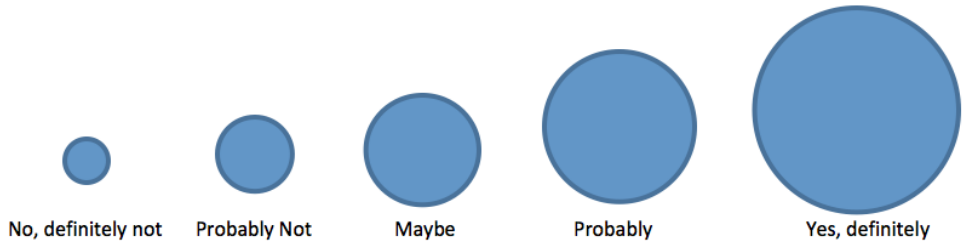


[Remember, mark an "x" through the circle that shows how you sure you are about the statement]

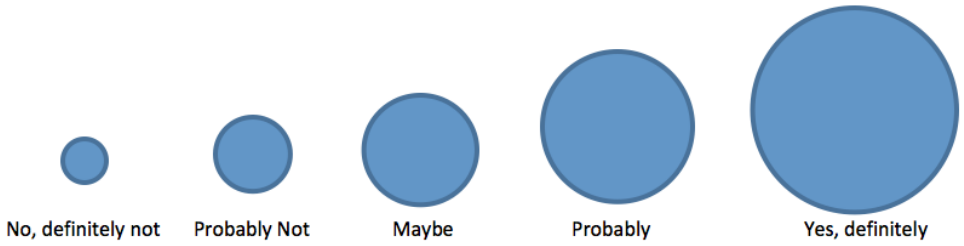
6. Do things to make it easier for Riley to stay in the classroom with us



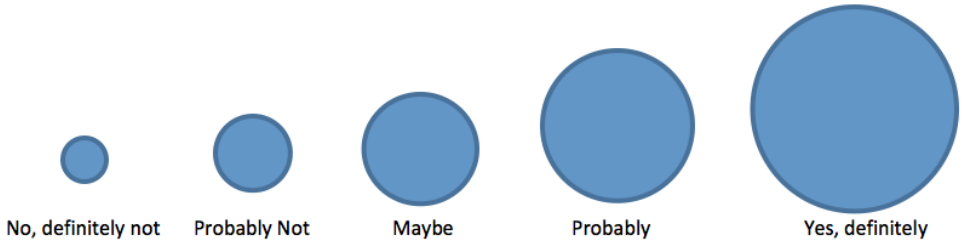
7. Turn the brightness of a computer screen down when working on group project because it bothers Riley



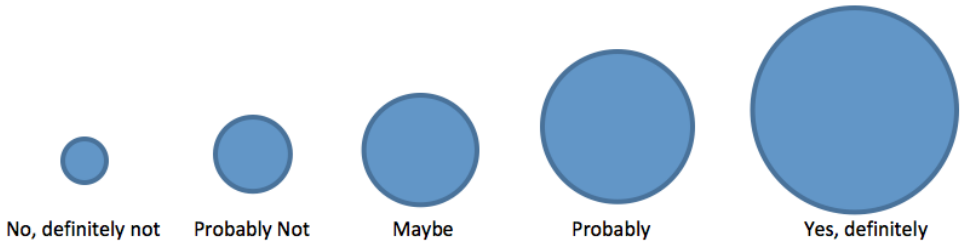
8. Be gentle with my desk because too many loud noises can be overwhelming to Riley



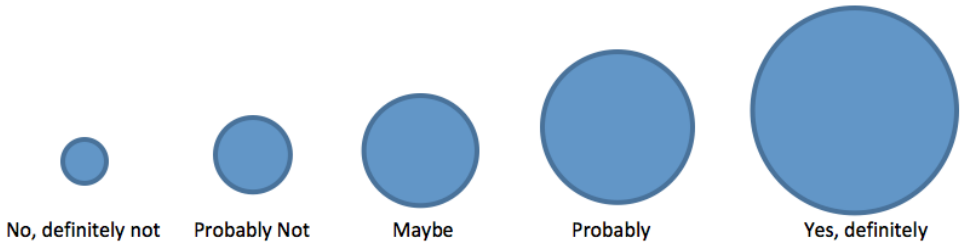
9. Turn off some of the lights with my teacher's permission when it's really bright outside so the lights won't hurt Riley's eyes



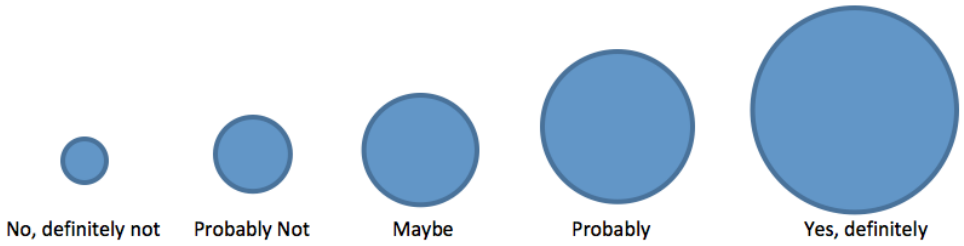
10. Turn my phone on silent so the noise doesn't distract Riley



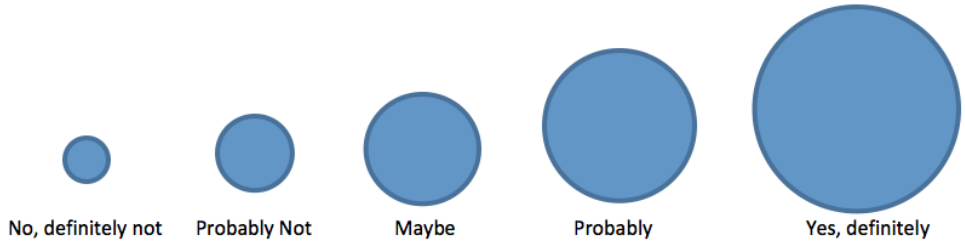
11. Be careful not to bump into Riley



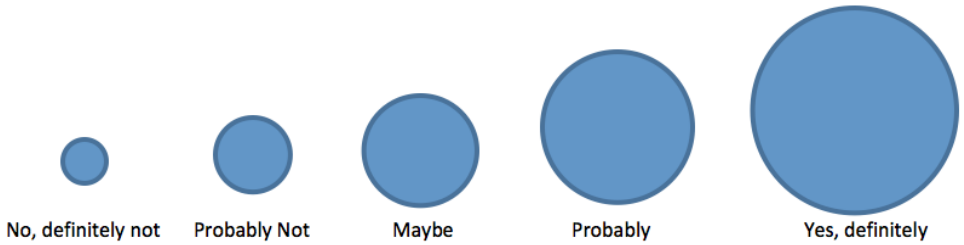
12. Keep my music volume low so Riley won't get overwhelmed



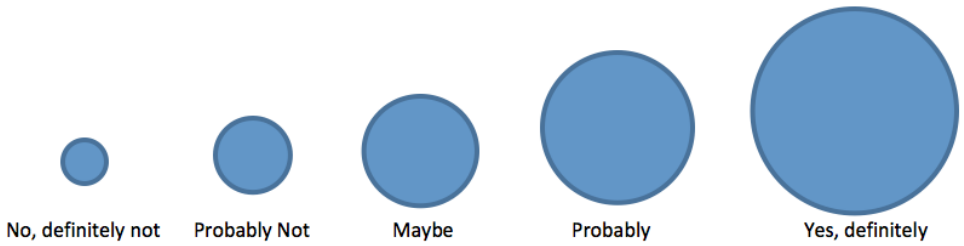
13. Ask Riley about the things [he/she] likes to eat since [she/he] only likes some foods



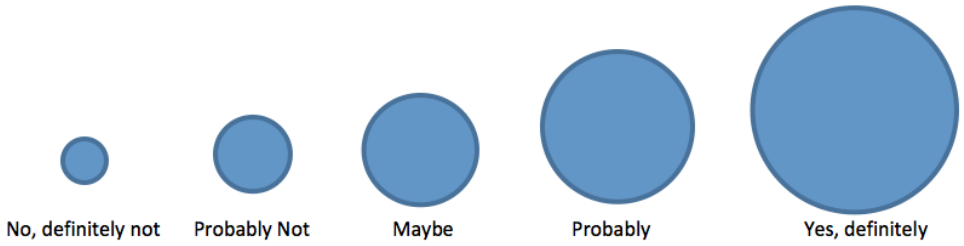
14. Adjust and avoid things that bother Riley



15. Leave Riley alone when [she/he] doesn't want to hang out



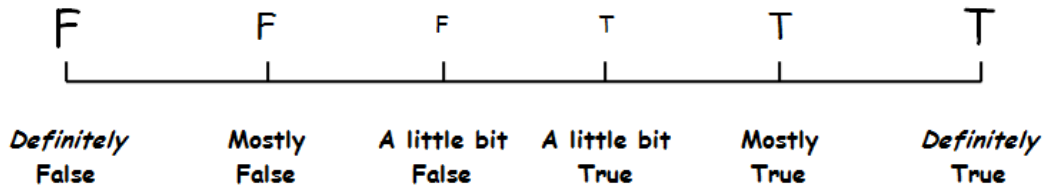
16. Adjust to what a new student with autism likes and doesn't like



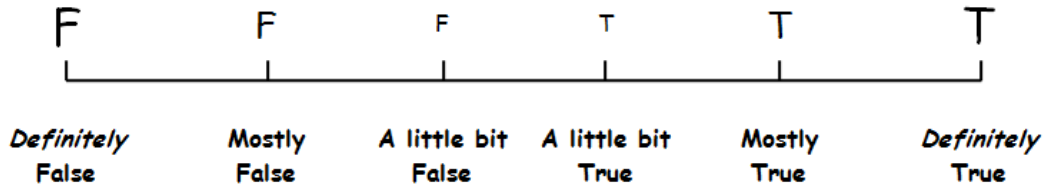
APPENDIX I: SOURCES OF SELF-EFFICACY TOWARDS

For the next part, tell us more about getting along with students like Riley. Circle the answer that shows how True or False you think the sentences are about you. For example, number 1, "I am excellent at getting along with students like Riley." Is that Definitely False, Mostly False, A little Bit False, A Little Bit True, Mostly True, or Definitely True? If you feel sure you can do that, then circle the biggest T. If you feel sure you cannot do that, then circle the biggest F. If you feel somewhere in between, then circle one of the other choices in the middle.

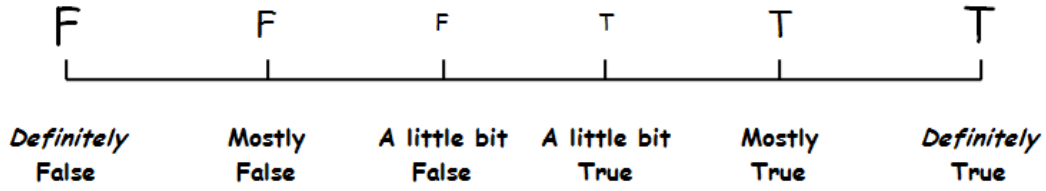
1. I am excellent at getting along with students like Riley.



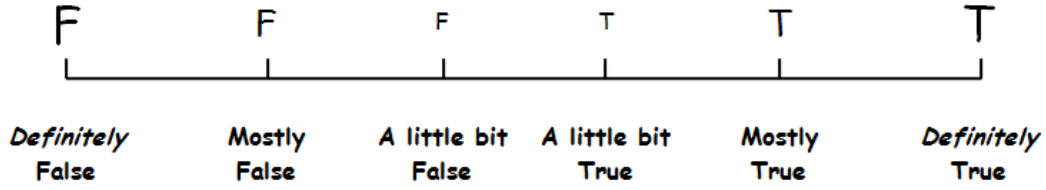
2. I have always been successful at getting along with students like Riley.



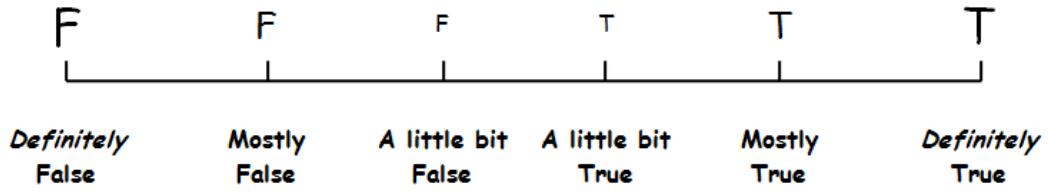
3. Even when I try hard, I do poorly at getting along with students like Riley.



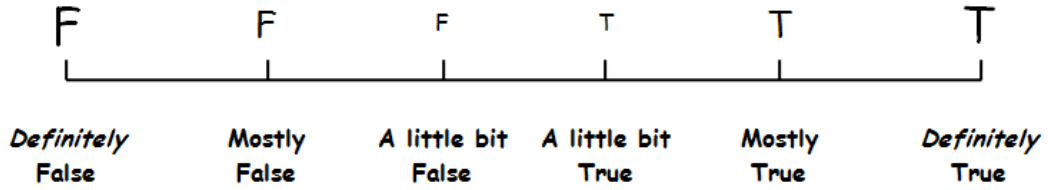
4. I got along with students like Riley last year.



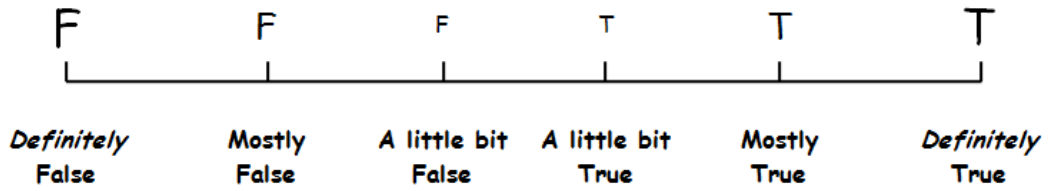
5. I do well at getting along with students like Riley.



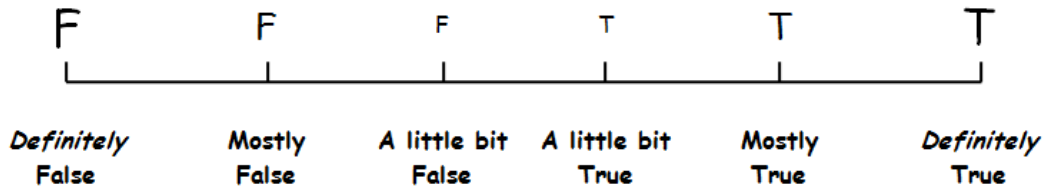
6. I am good at getting along with students like Riley.



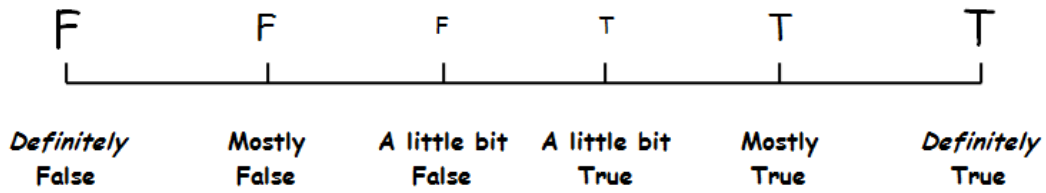
7. Seeing my teacher get along with students like Riley pushes me to do better at getting along with students like Riley, too.



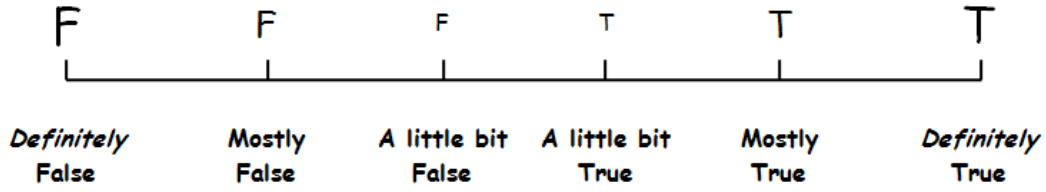
8. When I see how my teacher gets along with students like Riley, I can picture myself getting along with students like Riley, too.



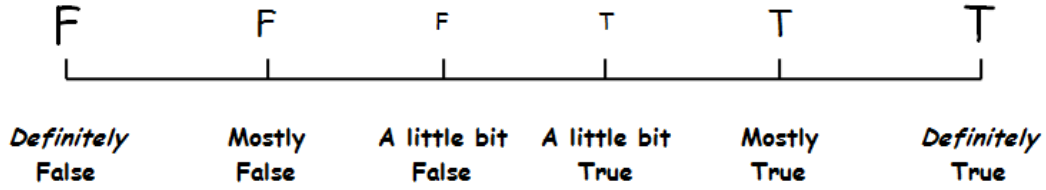
9. Seeing kids get along with students like Riley pushes me to do better at getting along with students like Riley, too.



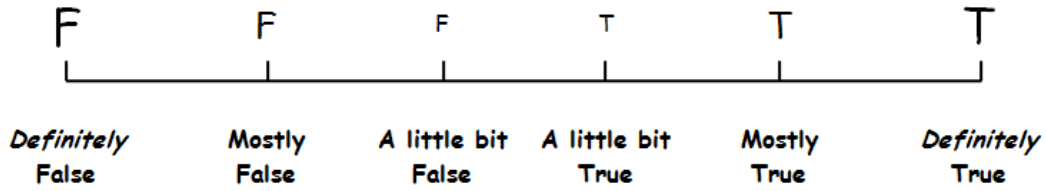
10. When I see how another student gets along with students like Riley, I can see myself getting along with students like Riley, too.



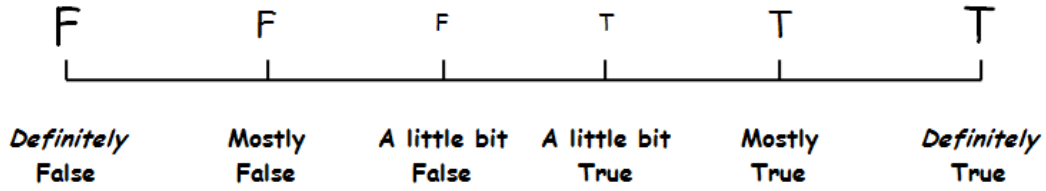
11. I imagine myself getting along with students like Riley.



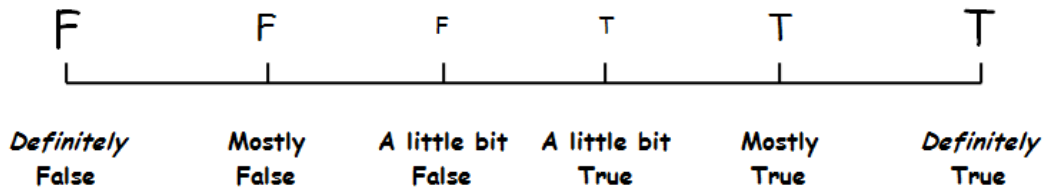
12. My teachers have told me that I'm good at getting along with students like Riley.



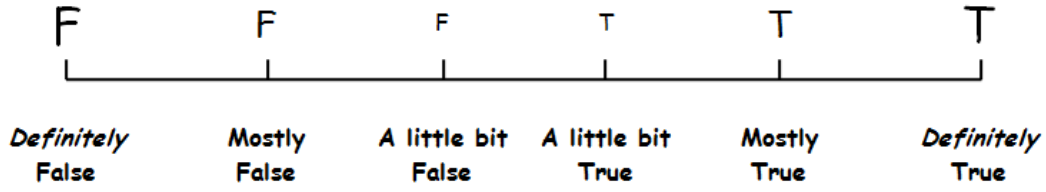
13. People have told me that I have a talent at getting along with students like Riley.



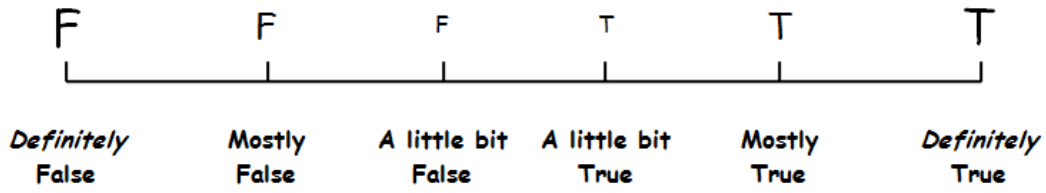
14. Adults in my family have told me that I am good at getting along with students like Riley.



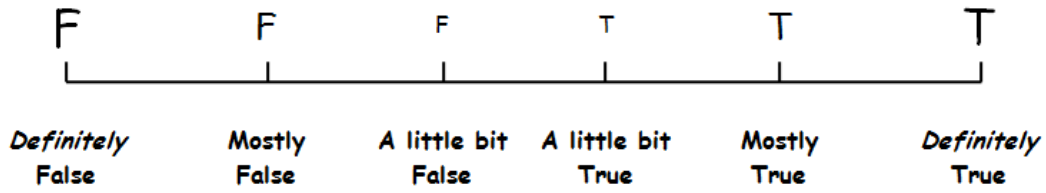
15. I have been praised for getting along with students like Riley.



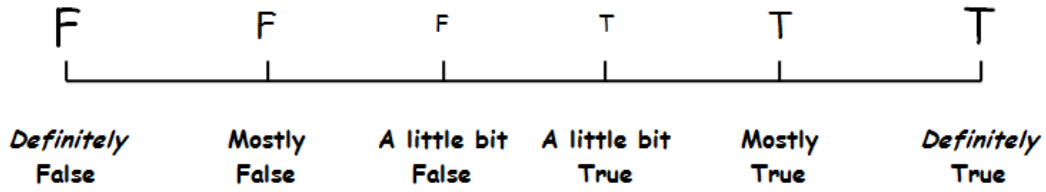
16. Other students have told me that I'm good at getting along with students like Riley.



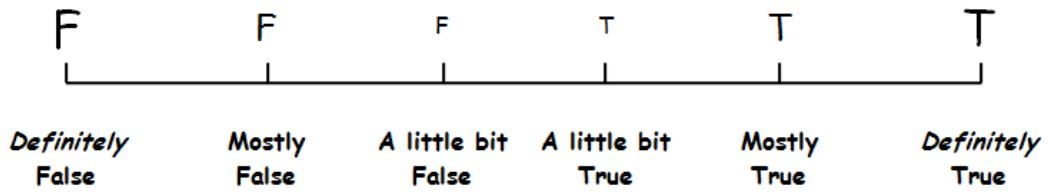
17. My classmates like to hang out with me because they think I'm good at getting along with students like Riley.



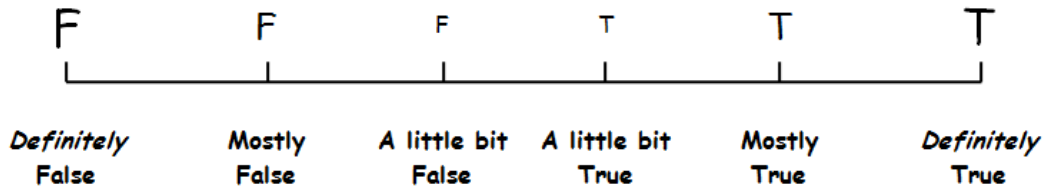
18. Just being around students like Riley makes me feel stressed and nervous.



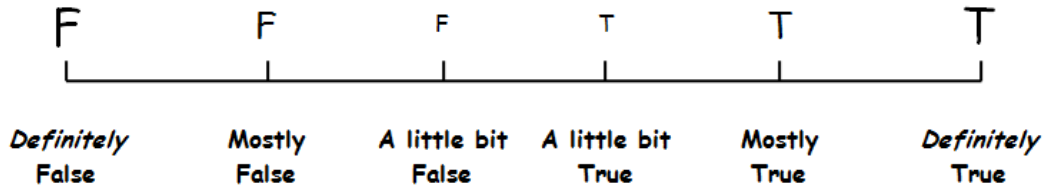
19. Being around students like Riley takes all of my energy.



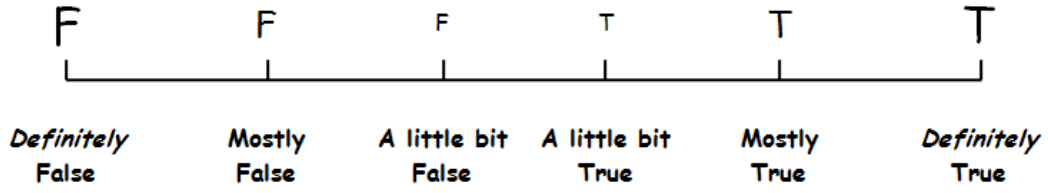
20. I start to feel stressed-out when I am around students like Riley.



21. My mind goes blank and I am unable to think clearly when I am around students like Riley.



22. I get depressed when I think about being around students like Riley.



23. My whole body becomes tense when I have to be around students like Riley.