

ASSESSMENTS USED BY BOARD CERTIFIED BEHAVIOR ANALYSTS FOR
CHILDREN WITH AUTISM SPECTRUM DISORDER AND SOCIAL BEHAVIOR
DEFICITS

by
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ABSTRACT

Children with Autism Spectrum Disorder (ASD) have various functional deficits including deficits in communication and social skills, which are often target areas for intervention and assessed by professionals using various assessment tools. Decision making about assessment tool selection and utility for ASD was the focus of this study. Behavior Analysts were surveyed regarding their perceptions and use of various behavioral, social, and cognitive assessment tools. Application of the tools to scenarios of children with ASD of various ages was assessed. Results indicate the more familiar Board Certified Behavior Analysts (BCBAs) are with a tool, the higher the reported use of it. Similarly, familiarity rating was positively correlated with likelihood of use in clinical scenarios for the VB-MAPP but not for the ABLLS-R. Age of child, and years of experience a BCBA had were not significant predictors of use of assessment tools for skills development in ASD.

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CHAPTER I

INTRODUCTION

Autism spectrum disorder (ASD) is a complex disorder involving various areas of functional deficits, or variations. Specifically, children with ASD typically demonstrate problems with communication and social skills. *The Diagnostic and Statistical Manual of Mental Disorders*, (5th ed.; DSM- 5; American Psychiatric Association(APA), 2013) includes in the criteria for ASD, “Persistent deficits in social communication and social interaction across multiple contexts, as manifested by deficits in social-emotional reciprocity...., deficits in nonverbal communicative behaviors used for social interaction...., deficits in developing, maintaining, and understanding relationships....” (APA, 2013, p. 50). When intervening with individuals with ASD, social skills are commonly a main target for intervention. An individual’s social skills are assessed in various ways. Two available assessment tools for comprehensively assessing social skills in the field of Applied Behavior Analysis (ABA) are the Assessment of Basic Language and Learning Skills (ABLBS-R) and the Verbal Behavior Milestones Assessment and Placement Program (VB-MAPP). These tools are used for children with ASD and other language delays to teach skill acquisition including language, social skills, and listener responding. This review will describe the use of the ABLBS-R and VB-MAPP when designing social intervention plans for children with ASD. Specifically, I will examine the use of the two assessment tools and how professionals in the field of ABA are using them to intervene socially for children with ASD. Finally, a study exploring potential

preference among professionals in ABA of one of the assessment tools and how and why professionals choose to use these and other tools to develop and monitor social intervention plans for children with ASD is presented.

ABLRS-R

The ABLRS was developed by James W. Partington, Ph.D., BCBA-D in 1998 and was revised (ABLRS-R) in 2006 (Partington, 2008). The ABLRS-R assess 25 skill areas that are composed of 544 skills (Partington, 2008). The assessment was developed from *Verbal Behavior* by B.F. Skinner (1957). Although using a relatively small sample size ($n = 21$) of participants ranging in age from 4 to 8 years, Malkin, Dixon, Speelman, and Luke (2016) reported high convergent validity in that ABLRS-R scores correlated with scores from Promoting the Emergence of Advanced Knowledge Relational Training System – Direct Training Module (PEAK – DT) and Vineland Adaptive Behavior Scales, Second Edition (VABS – II), ($r = 0.95$) and ($r = 0.56$), respectively.

Reliability of the ABLRS-R was examined by Partington, Bailey, and Partington (2016) with a sample of 50 typical children and found test-retest ($r = 0.84$) and internal consistency reliabilities ($\alpha = .90$).

Of the 25 skill areas targeted on the ABLRS-R, two categories specifically target social interactions. They are identified as social interactions and play and leisure skills in the assessment. Under the social interaction category, there 34 listed skills that are evaluated and targeted to help improve a child's social interaction. Some objective examples of rudimentary and advanced skills necessary for social interaction include:

looks at others to start social interaction, physically approaching others, sharing, delivers a message, and obtains and maintains attention of others (Partington, 2008). The second section, play and leisure skills, outlines 15 more skills that are necessary for improvement in social interactions. Examples of skills necessary in this section, from rudimentary to advanced are: explores toys in the environment, allows others to touch toys, plays independently with verbal behavior, plays with toys and talks with peers, and plays board games (Partington, 2008). Length of time for administration of ABLLS-R can vary depending on the child's skill and the administrator's training and experience.

VB-MAPP

The VB-MAPP was developed by Mark Sundberg, Ph.D., BCBA in 2008. The VB-MAPP is also based on Skinner's (1957) *Verbal Behavior*. The VB-MAPP consists of five components: a milestone assessment, a barriers assessment, a transition assessment, a task analysis and skill tracker, and a placement and IEP goals section (Sundberg, 2008). Malkin et al. (2016) found the VB-MAPP to have high convergent validity with the PEAK-DT ($r = 0.83$) as was found with the ABLLS-R for children 4 to 8 years. Barnes, Mellor, and Rehfeldt (2014) had two professionals who were school psychologists and certified behavior analysts administer the VB-MAPP and found high inter-observer agreement (IOA) 82.5%-85.9% with confederate clients.

The first component, the VB-MAPP assesses social and social play milestones. The second component, assesses deficient social skills. The third component, assesses where the child is making progress. The fourth component, breaks down the necessary

skills and are supported by a curriculum guide. The fifth component is the intervention guide and can be used for placement recommendations and IEP goals (Sundberg, 2008).

The VB-MAPP breaks its target skills down into three levels with each level containing milestones. It has a category that is labeled social behavior and play, where the skills necessary for social interaction are found. Level one contains targets, such as makes eye contact as a mand (i.e., a request), spontaneously makes eye contact with other children, spontaneously engages in parallel play, and follows peer or imitates their movement (Sundberg, 2008). Level two contains targets that involve reciprocity, such as initiates a physical interaction with a peer, spontaneously mands to a peer, engages in play with a peer for 3 minutes, and spontaneously mands to peers to participate in games or play. Finally, level three has the more advanced skills that are necessary for social engagement, such as cooperating with peers, using more complex language when engaging in play by asking WH questions (e.g., who, what, where), intraverbally responds to peer questions, engages in pretend play with peer for 5 minutes, and engages in 4 verbal exchanges about 1 topic for 5 topics (Sundberg, 2008). The time to administer the VB-MAPP will vary depending on child level with higher levels taking longer. To assess current level, the VB-MAPP offers the milestone assessment that contains 170 items and barriers assessment that contains 24 items (Sundberg, 2008). These scores then allow the administrator to identify what milestone the child is currently exhibiting and what skills to target next.

Comparison of the ABLLS-R and VB-MAPP. After reviewing the description of both assessment tools, one sees a similarity in the way social interactions are defined across these tools. The interactions begin with rather basic components, such as making eye contact with peers, to more advanced components, such as engaging in verbal interactions about multiple topics (Partington, 2008; Sundberg, 2008). However, the ABLLS-R has 34 targets listed under the social skills assessment section and an additional 15 that are assessed in play and leisure, whereas the VB-MAPP has a total of 15 milestones under the social and play section of the assessment. Although the VB-MAPP has 15 milestones, if a child did not meet the goal to the interventionist's standards, there is a task analysis offered for each of the milestones, offering approximately 70 total goals in the social skills area. There is a discrepancy in the total number of goals that are presented by each assessment tool and how each assessment tool assesses them, with the VB-MAPP assessing more specific aspects of social skills development.

Moreover, professionals may differ with respect to use of these assessment tools. For example, one professional may use each task analysis provided by the VB-MAPP to apply a more comprehensive teaching package, whereas another may only target the 15 milestones. Similarly, a professional may use the ABLLS-R to target social skills because there are more social skill goals targeted in the assessment. A professional also may select either the ABLLS-R or VB-MAPP based on the skill level of the client or their own familiarity with an assessment tool.

As the assessment tools have a similar focus progression in their targeted behaviors, but also differences in assessment processes, two important questions arise Which tool is better for evaluating and training social interactions or social skills in those with ASD, and how does an interventionist determine which assessment tool to use in various circumstances?

The Assessment Process for Social Behavior in ASD

In the field of ABA, the assessment process consists of multiple steps including, but not limited to, assessment, treatment planning, insurance approval, and reviewing/ updating treatment plans. As Board Certified Behavior Analysts (BCBAs) begin the process of assessment and intervention with a client, it is important to recognize the steps necessary to accomplish a successful treatment plan. Hawkins (1979) outlines the behavioral assessment in 5 steps. The first step is to screen for general disposition, the second step is defining the problem, the third step is to design an intervention, the fourth step is to monitor progress, and lastly, the fifth step is to conduct follow- up. At exactly which point in this process does the professional choose which assessment tool will best fit a child's need can vary, but it appears to be a critical part of steps one and two.

First, it is important to understand the functional and topographical explanation of what social skills or social competence involves. Odom and McConnell (1992) defines social competence as, "the effective and appropriate use of social behavior in interactions with an individual or individuals" (p. 239). Per Baer, Wolf, and Risley (1968), "to analyze a behavior you must do so in an analytic way that can be demonstrated through

events that are responsible for the occurrence or non-occurrence of a behavior” (p. 94). So, when talking about interventions for social skills, one must assess the behavior and how it pertains to the three-term contingency (i.e., antecedent, behavior, consequence). For example, the antecedent could be described as the behavior of others or a signal that reinforcement will be available if a certain social interaction occurs, the behavior would involve the social response emitted, and the consequence would become the potential reinforcement from peer interactions (Odom & McConnell, 1992).

As we are defining social skills and what they look like, it is important to note that although prosocial skills development is being targeted, professionals also are working to simultaneously extinguish problematic behaviors that arise. While it is important to be aware of the challenges of problematic behavior when assessing and intervening for social skills, the focus here will be the acquisition of prosocial behavior and not the extinction of problematic behavior that may be interfering with appropriate social skills development.

Prerequisite skills for social interaction. After we define a social interaction, we must examine the prerequisite abilities to engage in social interactions. Prerequisite skills are assessed using various developmental, norm or criterion-referenced assessments that measure a child’s current level of functioning. Behavior analysts use various assessments to gain an understanding of the children’s current level of functioning in order to see if they are exhibiting the skills necessary to engage and learn to participate in social interactions with other children. Peters and Thompson (2015) assessed ways to teach

children with ASD to respond to a conversation partner's interest, reporting the IQ scores of their participants who ranged in ages from 4 to 9 years. Kisamore, Kartsen, and Mann (2016) studied seven individuals ages 4 to 18 years diagnosed with ASD and assessed them using the Peabody Picture Vocabulary Test, Fourth Edition (PPVT-IV) to examine their language abilities. Similarly, Leaf et al. (2012) used the PPVT-IV to examine children's language abilities and included only children with an IQ above 70, (assessed with various standardized measures to rule out intellectual disability), in their study comparing intervention strategies to teach children with ASD social skills. Tools such as the PPVT-IV or IQ tests provide norm-referenced levels of functioning, but fail to describe specific topographical or functional aspects of a domain as would be needed by a behavior analyst to develop an intervention plan.

When a child with ASD receives services, they can be assessed using the VB-MAPP or ABLLS-R, both criterion referenced assessment tools, to gain an overview of their behavioral repertoire and to provide specific skill areas for intervention. As described by Hawkins (1979), a criterion-referenced tool is the best choice when assessing children as it allows for a descriptive outlook of what steps should come next in intervention based on the child's repertoire. The purpose of this assessment is to identify a child's skill deficiencies and strengths. Both the ABLLS-R and the VB-MAPP provide these data.

Choosing assessment tools. Kisamore et al. (2016) evaluated seven children aged 4 to 19 years and used the intraverbal subtest from the VB-MAPP to assess intraverbal

skills, which are viewed as necessary skills for social interactions before testing their interventions. Similarly, Humphreys, Polick, Howk, Thaxton, and Ivancic (2013) evaluated 2 children ages 4 and 7 years and used the VB-MAPP to assess verbal ability before testing intervention to teach intraverbals to children with ASD. Moreover, Brodhead, Higbee, Gerencser, and Akers (2016) evaluated 3 participants ages 4 and 7 years and used the VB-MAPP to assess verbal ability in requesting for items. Polick, Carr, and Hanney (2012) evaluated 2 participants ages 3 and 4 years and used the VB-MAPP for their study teaching intraverbals to children with ASD.

On the other hand, in their study of intraverbal skills training with 3 participants with ASD, ages 4 to 6 years, Dickes and Kodak (2015) used the ABLLS-R. Likewise, Kroeger, Schultz, and Newsom (2007) used the ABLLS-R to assess 25 participants with ASD ages 4 to 6 years before group interventions used to increase pro-social behaviors. Clearly, both the ABLLS-R and VB-MAPP are being used in empirical studies with young children with ASD to evaluate social skills. The decision-making process for using each assessment tool, however, is not well described.

Summary and Purpose of Current Study

Individuals with ASD are deficient in communication and social interaction skills. The *DSM- 5* (APA, 2013) includes in its criteria for ASD, “Persistent deficits in social communication and social interaction across multiple contexts, as manifested by deficits in social-emotional reciprocity....” (p. 50). Children with ASD often receive intervention to aid in the growth of skills necessary to engage and communicate with other people.

Two relevant assessment tools available to ABA professionals who are providing ABA services to individuals with ASD are the ABLLS-R and the VB-MAPP. Both evaluate skills the child currently demonstrates and provide treatment plan targets and goals for areas of potential growth. These two measures also are used to monitor skills development and progress throughout treatment. The ABLLS-R and the VB-MAPP have similar content. For example, they initially focus on rudimentary skills and progressively focus on more advanced skills (e.g., making request of a peer or engaging in sustained play for 3 minutes). Differences in these tools can be seen in structure. For example, the VB-MAPP uses levels and each level includes target skills that are further broken down into milestones. In the ABLLS-R, the target skills are laid out A through Z and have numbered skills in each target area. There are also differences in how many goals are targeted and the specificity of the skills they measure.

Empirical studies examining social skills specifically for children with ASD indicate that both the ABLLS-R and the VB-MAPP are used with this population (e.g., Brodhead et al., 2016; Dickes & Kodak, 2015; Humphreys et al. 2013; Kisamore et al., 2016; Kroeger et al., 2007; Polick et al., 2012). However, none of the studies described the steps in choosing a specific assessment tool (i.e., VB-MAPP or ABLLS-R). Furthermore, research is not consistent about the utility of the tools when assessing social skills in children with ASD. Thus, the purpose of the present study was to explore which assessment tools were used by ABA professionals when addressing social skills deficits in children with ASD. In addition, the present study predicted that the reasons why one or

the other assessment tool is chosen. Specifically, what characteristics of an assessment tool and of the child are ABA professionals considering when selecting a specific assessment tool (e.g., psychometric properties, familiarity, structure). Specifically, we predicted the usefulness for the assessment tools presented would be positively correlated with frequency of use. This was predicted because the more useful a professional finds an assessment tool, the more often a professional is to use it. Also, participants will be more likely to use the VB-MAPP to assess younger children and the ABLLS-R to assess older children, regardless of functioning. This prediction was based on a tendency for professionals in the field of ABA to use age as a sole determinate for choice of assessment tool. There will be a positive correlation between the assessment tool with which participants are most familiar and which ones they are most likely to use. This prediction is based on the premise that once an assessment tool has become familiar, the more likely a professional is to stick with that assessment tool than learn or try other assessment tools. We also predicted the fewer years of experience as a BCBA the more likely they are to use the VB-MAPP rather than the ABLLS-R. This prediction was based on the premise that the VB-MAPP is a newer assessment tool than the ABLLS-R and those who are new to the field were most likely trained using the VB-MAPP, the newer assessment tool, compared to those who were trained using the ABLLS-R. Lastly, the pattern of tools used in scenarios of children of different ages and skill levels will differ for BCBA-Ds and CBAs. This prediction was based on the level of training and

expertise between a Master's level ABA professional, compared to a Doctorate level ABA professional.

CHAPTER II

METHOD

Participants

Participants were 42 Board Certified Behavior Analysts (BCBAs) who have worked with children with ASD. Each BCBA had been certified for at least 2 years, and had at least 2 years of experience working with children with ASD between the ages 2 and 14 years. Table 1 provides a summary of the demographic variables for the sample. As evident, most participants were Caucasian female BCBAs with master's degrees in Special Education.

Participants were recruited through social media outlets. Social media outlets included BCBAs sharing the link via Facebook, Twitter, Instagram, email, and the Behavior Babe Facebook page. There were 127 participants who responded to the survey. Of the respondents, 85 were not eligible to participate. Reasons for exclusion were: not being a BCBA ($n = 30$), not having 2 years of experience ($n = 55$), or not having experience with children with ASD ($n = 30$). The remaining 42 participants completed the survey and were used in the analyses.

Materials

An author constructed, online survey was developed to assess the target constructs. It included questions to identify the participants' professional credentials and experiences and Likert items regarding the use of specific assessment tools and scenarios

Table 1

Demographics of participants

	<i>N</i>	<i>Percent</i>
Age		
25-34 years old	13	31.4
35-44 years old	17	41.5
45-54 years old	9	22.0
55-64 years old	2	4.9
Race		
Hispanic or Latino	1	2.4
Black or African American	1	2.4
Asian/ Pacific Islander	1	2.4
Caucasian	37	90.2
Other	1	2.4
Gender		
Male	0	0
Female	41	100
Education		
Behavior Analysis	13	31.7
Psychology	9	22.0
Special Education	15	36.6
Other	3	7.3

to evaluate assessment tool of choice. The materials included: Demographics Items, Assessment Tool Items, Assessment Scenarios, and Scenario Assessment Items.

Demographic items. Author constructed demographic items (see Appendix A) included items on age, gender and ethnicity, as well as such as how long the participants have been certified, their highest degree of education, and field of study (e.g., Psychology, Special Education). Participants also were asked if they had worked with children on the autism spectrum, and if those children displayed social skills deficits.

Assessment tool items. Author constructed questions about assessment tools used in daily practice were included (see Appendix B). Participants were asked to rate usage, utility, and familiarity with each of 12 tools assessing aspects of developmental social skills. Participants were asked to rate the psychometric properties as well as aspects of utility for each tool using a 7- point Likert scale. The list of tools consisted of 12 tools that are commonly used to assess young children's behavioral, social, developmental, and cognitive abilities. These assessment tools were chosen as they all provide information about the strengths and deficits of a child that can be further used to develop treatment goals and identify target behaviors for intervention. They also may be used with children with ASD.

Assessment scenarios. Author constructed scenarios were used to assess potential child variables impacting decisions to use certain tools to assess social skills deficits (see Appendix C). Four scenarios were used, each describing a child with ASD with social skills difficulties. The age of the child (younger, older) and the level of social skills

deficits displayed (mild, severe) varied across the scenarios. Scenario one depicted a young child with limited verbal ability who displayed emerging social skills (e.g., eye contact, parallel play, approaches other children, will interact with adult prompts) necessary for a social interaction. Scenario two depicted an older child with limited verbal ability who displayed a severe deficit in social skills (e.g., no eye contact, only independent play, does not approach other children, engages in problem behavior when prompted to interact with other children). Scenario three depicted an older child with limited verbal ability who displayed emerging social skills (e.g., eye contact, parallel play, approaches other children, will interact with adult prompts) necessary for a social interaction. Scenario four depicted a young child with limited verbal abilities who displayed a severe deficit in social skill (e.g., no eye contact, only independent play, does not approach other children, engages in problem behavior when prompted to interact with other children).

Following each scenario, participants were asked to rank each tool in the relative order in which they would select the tool to use with the child, and to rate, on a 7-point Likert scale, how likely they would be to use that tool with that child. (See Appendix D).

Procedure

Participants received a link for an author constructed online survey to be completed using Qualtrics, an online survey web service. The participants first were directed to a consent form (see Appendix E). Once consenting, they were directed to fill out the demographic items to determine eligibility to participate in the study. Participants

who had fewer than two years of experience as a BCBA or who did not work with children with ASD (i.e., “no” on items 4 or 7) were excluded from the rest of the survey. Those eligible to continue then were directed to the remaining survey items, beginning with the assessment tool ratings. Following those rating items, participants were given two of the four scenarios describing children who display social skills deficits; which two they saw were randomly assigned using the Qualtrics randomization process. Each participant saw one scenario with an older child and one with a younger child. The participants then were directed to a form asking them to rate the likelihood of using the twelve tools presented for the scenario. Finally, they were asked to provide an order of preference (i.e., rank order) for using the 12 tools with the child in each scenario.

CHAPTER III

RESULTS

Table 2 presents the descriptive statistics for the ratings for the 7 areas assessed for both the ABLL-R and the VB-MAPP. Although specific hypothesis were not proposed for each of these ratings, descriptively the pattern shows moderate to high ratings (i.e., 4.64-6.77 on a 7 point scale) for both tools in each category, indicating positive perceptions of the utility of both the ABLLS-R and the VB-MAPP.

It was hypothesized that the more familiar BCBA's are with a tool, the more frequently they are to use it. This hypothesis was examined using mean rating scores obtained from items 1 and 7 of the Assessment Tool Items. The data were analyzed using Pearson product-moment correlations. Results of the correlational analyses indicated that there was a significant positive association between familiarity with and frequency of use for the ABLLS-R, $r(39) = .67, p < .001$, and for the VB-MAPP $r(39) = .84, p < .001$. Therefore, the more familiar they were with the tool, the more frequently they were to use that tool. Familiarity and frequency of use ratings were significantly positively correlated for not only the ABLLS-R and VB-MAPP, but for all assessments presented (see Table 3).

Regarding the application of use of these tools with children with ASD, it was hypothesized that participants would be more likely to choose to assess the younger children using the VB-MAPP and to choose to use the ABLLS-R to assess the older children in the scenarios, regardless of the child's level of functioning. The mean

Table 2

Means and standard deviations for ratings of the ABLLS-R and the VB-MAPP

	ABLLS-R	VB-MAPP
	<i>M (SD)</i>	<i>M (SD)</i>
Familiarity	6.41 (.94)	6.77 (.63)
Usefulness	6.03 (.96)	6.38 (1.16)
Reliability	5.66 (.99)	6.05 (.86)
Coverage of Skills	5.05 (1.29)	5.11 (1.25)
Ease of Administration	4.64 (1.77)	4.77 (1.660)
Helpfulness for ASD	5.87 (1.08)	6.15 (1.29)
Frequency of Use	4.87 (1.63)	5.82 (1.32)

Note. All ratings are based on a 7-point Likert scale with higher scores reflecting more positive perceptions.

Table 3

Correlations for familiarity and frequency of use for assessment tools

		ABAS	ABLLS-R	AFLS	Bayley III	DAYC	Leiter
ABAS	Pearson Correlation	.74	—	—	—	—	—
	Sig. (2- tailed)	.000					
	N	38					
ABLLS- R	Pearson Correlation	—	.67	—	—	—	—
	Sig. (2- tailed)		.000				
	N		39				
AFLS	Pearson Correlation	—	—	.71	—	—	—
	Sig. (2- tailed)			.000			
	N			39			
Bayley III	Pearson Correlation	—	—	—	.38	—	—
	Sig. (2- tailed)				.019		
	N				39		
DAYC	Pearson Correlation	—	—	—	—	.63	—
	Sig. (2- tailed)					.000	
	N					37	
Leiter	Pearson Correlation	—	—	—	—	—	.52
	Sig. (2- tailed)						.001
	N						39

Table 3 (cont.)

Correlations for familiarity and frequency of use for assessment tools (cont.)

		PPVT	PEAK- DT	VB- MAPP	VBAS	WISC	WPPSI
PPVT	Pearson	.43	—	—	—	—	—
	Correlation	.007					
	Sig. (2- tailed)	38					
	N						
PEAK-DT	Pearson	—	.71	—	—	—	—
	Correlation		.000				
	Sig. (2- tailed)		39				
	N						
VB-MAPP	Pearson	—	—	.94	—	—	—
	Correlation			.000			
	Sig. (2- tailed)			39			
	N						
VBAS	Pearson	—	—	—	.82	—	—
	Correlation				.000		
	Sig. (2- tailed)				39		
	N						
WISC	Pearson	—	—	—	—	.49	—
	Correlation					.002	
	Sig. (2- tailed)					39	
	N						
WPPSI	Pearson	—	—	—	—	—	.58
	Correlation						.000
	Sig. (2- tailed)						38
	N						

rankings in the Scenario Assessment Items were used to assess this hypothesis. The data were analyzed using a repeated measures ANOVA. The mean rankings for the ABLLS-R were similar for younger children ($M = 3.48$, $SD = 2.40$, $n = 21$) and older children ($M = 3.71$, $SD = 2.49$, $n = 21$), $F(1, 20) = .10$, $MSE = 5.85$, $p = .753$. Also, respondents similarly ranked the VB-MAPP for younger children ($M = 3.00$, $SD = 3.27$, $n = 21$) and older children ($M = 4.57$, $SD = 3.01$, $n = 21$), $F(1, 20) = 3.19$, $MSE = 8.13$, $p = .089$. The hypothesis was not supported.

It was further hypothesized that there would be a significant positive correlation between familiarity ratings with a tool (i.e., question 1 from the Assessment Tool Items) and likelihood of use ratings with the children with ASD in the scenarios (i.e, question 1 from the Scenario Assessment Items). These data were analyzed using Pearson product-moment correlations. Results of the Pearson correlation indicated that there was a significant positive association between familiarity rating and likelihood of use rating for the VB-MAPP, $r(27) = .40$, $p = .032$, but not for the ABLLS-R, $r(27) = .35$, $p = .061$. A significant positive correlation also was found between the ratings of likelihood to use the ABLLS-R and the VB-MAPP in the scenario, $r(28) = .51$, $p = .004$; they rated these tools as similarly likely to be used to assess the children in the scenario.

An additional hypothesis postulated that BCBA's with fewer years of experience would report more frequently using the VB-MAPP than the ABLLS-R compared to BCBA's with more experience. Participants were divided into two groups based on years of experience as a BCBA: 2-5 years and 6+ years of experience. The relationship

between years of experience (2-5 years, 6 + years) and frequency of use of assessment tool (VB-MAPP, ABLLS-R) were analyzed using a series of one-way ANOVAs. The one-way ANOVA ($\alpha = .05$) indicated that the reported use of the VB-MAPP was not different across the 2-5 year group ($M = 4.74$, $SD = 1.66$, $n = 27$), and the 6 + year group ($M = 5.00$, $SD = 1.55$, $n = 11$), $F(1, 37) = .99$, $MSE = .95$, $p = .325$, $\eta^2 = .027$. Similarly, an additional one-way ANOVA ($\alpha = .05$) indicated that the reported use of the ABLLS-R was similar across the 2-5 year group ($M = 6.33$, $SD = 1.30$, $n = 27$), and the 6 + year group ($M = 6.45$, $SD = .82$, $n = 11$), $F(1, 37) = .08$, $MSE = 1.41$, $p = .777$, $\eta^2 = .002$.

Lastly, it was hypothesized that the pattern of tools used in the scenarios would differ for BCBA-Ds (doctoral level) and BCBAAs (master's level). This analysis could not be conducted due to the limited number of BCBA-Ds ($n = 3$) in the sample.

CHAPTER IV

DISCUSSION

Autism Spectrum Disorder is a complex disorder accompanied by various deficits in communication and social skills. Social skills are commonly a main target for intervention. An individual's social skills are assessed in various ways. Two available assessment tools for comprehensively assessing social skills in the field of Applied Behavior Analysis (ABA) are the Assessment of Basic Language and Learning Skills (ABLLS-R) and the Verbal Behavior Milestones Assessment and Placement Program (VB-MAPP). These tools are used for children with ASD and other language delays to teach skill acquisition including language, social skills, and listener responding.

Empirical studies examining social skills, namely for children with ASD, indicate that both the ABLLS-R and the VB-MAPP are used with this population (e.g., Brodhead et al., 2016; Dickes & Kodak, 2015; Humphreys et al. 2013; Kisamore et al., 2016; Kroeger et al., 2007; Peters & Thompson, 2015; Polick et al., 2012). However, the process of how an assessment tool is chosen is not described in the studies.

As Hawkins (1979) outlines, there are 5 steps in behavioral assessment (screening for general disposition, defining the problem, designing an intervention, monitoring progress, and conducting a follow-up), with the assessment component playing an integral part in a successful intervention. As we identify the assessment process as being a gateway to child success, the assessment tools chosen should be selected in a systematic way that benefits the individual based current functioning, and future functioning.

Therefore, we reviewed the use of the ABLLS-R and VB-MAPP when designing social intervention plans for children with ASD. The study explored ABA professionals' preference with respect to the use of these two assessment tools. Also, how and why professionals choose to use these tools to develop and monitor social intervention plans for children with ASD were explored.

A significant positive correlation was found between the familiarity a BCBA has with a tool and the frequency with which he/she reports using it, regardless of which tool it was. This finding may indicate a preference for assessment tools based on routine familiarity rather than using an assessment tool based on functional features or psychometric quality of assessment tools. These findings may suggest that previous researchers (e.g., Brodhead et al., 2016; Dickes & Kodak, 2015; Humphreys et al. 2013; Kisamore et al., 2016; Kroeger et al., 2007; Peters & Thompson, 2015; Polick et al., 2012) utilizing either the VB-MAPP or ABLLS-R in their studies, may have chosen the assessments on the basis of familiarity. Although familiarity with an assessment tool is critical in yielding reliable results, professionals should be aware of falling into a regimen regarding use of assessment tools. The Behavior Analyst Certification Board ethics code (BACB, 2014) states that the type of assessment used should be determined by client's needs and other contextual variables. For BCBA's to ensure they are using best practice, they should refer to this section of the ethics code and make efforts to educate themselves on the utility of assessment tools in the field that would be the best fit for their client's needs.

Also, it was found for the VB-MAPP, the more familiar a BCBA is with the assessment tool, the more likely there were to use it in the scenarios. This finding is similar with previous research. For example, Brodhead et al., 2016; Humphreys et al. 2013; Kisamore et al., 2016; Polick et al., 2012 all used the VB-MAPP in research to assess participants in their study. An explanation for why they chose this tool was not presented. However, it could be speculated that the VB-MAPP is a commonly used assessment tool in the field of ABA, thus familiarity with the tool would be presumed. Regardless of functioning, age, or any other individual ability, a BCBA is likely to assess a child with ASD using an assessment tool with which they are familiar. This finding provides validation to the previous correlation such that, as BCBA's report familiarity with an assessment tool, they were likely to choose that assessment tool to assess the kids in the scenario. This finding provides several important points. On one hand, it demonstrates that BCBA's are utilizing assessment tools with which they report familiarity and further demonstrates competency in the assessment process. On the other hand, it supports the notion that BCBA's may be falling into regimen and not educating themselves on other assessment tools that may better fit a client's needs.

The study did not find significance in age of the child and choice of assessment tool. Previous research (e.g., Brodhead et al., 2016; Dickes & Kodak, 2015; Humphreys et al. 2013; Polick et al., 2012) have used both the ABLLS-R and VB-MAPP to assess participants from ages 4-8 years. This aligns with the current finding such that, regardless of age, professionals are using both the ABLLS-R and VB-MAPP similarly in their

practice. However, the mean ratings of frequency of use were higher for the VB-MAPP for the younger children. Most likely due to the limitation in sample size, this finding did not reach significance, but may be indicative of a tendency to use this tool with younger children. Although conclusive evidence was not found, this finding may provide insight into previous research by Humphreys et al. (2013), Brodhead et al. (2016), and Polick et al. (2012) choosing to assess the children in their studies using the VB-MAPP. The children in the studies mentioned were all under the age of 7 years, similar in age to those presented in this study.

Similarly, there was no significance found in years of experience a BCBA had and preference for either the VB-MAPP or ABLLS-R assessments. This finding may support a more comprehensive approach to assessment. For example, when choosing an assessment tool, BCBAs may be utilizing an assessment tool based on multiple factors, including a child's verbal and social ability.

Limitations of Current Study and Recommendations for Future Research

This project has several limitations, both methodologically and conceptually. First, due to eligibility restrictions, only 41 of the 126 professionals who viewed the survey completed it and were utilized in the data analyses. There was a 2-year experience requirement for BCBAs to be eligible. This number was selected to eliminate inexperienced BCBAs who may not have developed a routine practice in using assessment tools. However, this requirement resulted in a loss of a significant number of the professionals who could have completed the survey. The resulting sample of 41

BCBAs is a small sample and not likely representative of practicing behavior analysts. For example, all of those who responded were Caucasian and female. These issues limit the utility of the findings in this study.

Further, 10 assessment tools that are commonly used to assess children regarding skill, developmental and cognitive abilities were included in the study along with the VB-MAPP and ABLLS-R, which were the main focus of this study. These additional tools were included to mask the true purpose of the study's focus on the ABLLS-R and the VB-MAPP. Due to the varying backgrounds of BCBAs, some participants may not have been familiar with all of the tools, thus could not rate several of the items. Some participants noted that they were not trained to use the assessments and did not feel they could rate the psychometric utility of the assessment tools; some did not complete the assessment items or stopped the survey prematurely altogether. It would have been better to include a *not applicable* or *cannot rate* response choice for participants to choose for tools with which they have little to no experience. Using the *neutral* response choice did not allow participants to accurately depict their knowledge and experience with each of the assessment tools presented.

In addition to correcting the limitations of the current study, future research should continue to evaluate factors that influence the use of the VB-MAPP and the ABLLS-R with children with ASD. Future research should also examine assessment use in relation to requirements of insurance companies. Further, research should look at the

use of informal assessments and how they relate to standardized assessments in the field of ABA.

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APPENDICES

APPENDIX A**Demographic Items**

What is your age:

- 18-24 years old
- 25-34 years old
- 35-44 years old
- 45-54 years old
- 55-64 years old
- 65-74 years old

Please specify your gender:

- Male
- Female

Have you been a BCBA for at least 2 years?

- Yes
- No

Please specify your ethnicity:

- Hispanic or Latino
- Black or African American
- Native American or American Indian
- Asian/Pacific Islander
- Caucasian
- Other

How long have you been a BCBA?

In what environment do you primarily provide services?

- Home
- Clinic
- School
- Community
- Other _____

In your time as a BCBA have you worked with children with autism spectrum disorder?

- Yes
- No

Which best describes you:

- BCBA
- BCBA-D

Have you written a behavior intervention plan that includes programming to enhance social skills?

- Yes
- No

What is your highest degree of education obtained?

- Master's
- Doctorate
- Other _____

In which of the following areas is our highest degree earned:

- Behavior Analysis
- Psychology
- Special Education
- Other _____

10. Vineland
Adaptive
Behavior Scales-
VABS

11. Wechsler
Intelligence
Scale for
Children- WISC

12. Wechsler
Preschool and
Primary Scale of
Intelligence-
WPPSI

APPENDIX C

Scenarios

Toby is a 4-year-old boy who was diagnosed with autism spectrum disorder when he was 3 years old. Toby was reported to have an IQ within the Average range. Toby has limited verbal skills, only speaking 1-2 word phrases. Toby's mom reports he will often hit others to get what he wants. When Toby is around other children, he does not typically initiate interactions, unless the child has something he wants. He then will either push the other child or take the item from the child. If an adult prompts physical play (i.e., chase or catch) Toby will engage without problem behavior, but will only engage for about 5 minutes and then walks away to play alone. Toby does make eye contact with his peers, and will engage in parallel play for 10 minute intervals.

Sara is a 12-year old girl who was diagnosed with autism spectrum disorder when she was 5. Sara has an IQ score within the Average range. Sara only talks to people with whom she is familiar, typically family members. Sara is home-schooled due to her behaviors at school. When Sara was enrolled in school, she would disrobe to escape a demand situation. When approached by peers, Sara would begin laughing and coughing uncontrollably and would not speak to the other children. These behaviors often resulted in peers walking away from Sara. When prompted by an adult to engage with peers, Sara would cry and scream. Sara does not make eye contact with peers and will not approach peers. Sara's independent play is described by reading books, or most often, holding dolls and waving them back and forth. Scenario 3

Emma is a 12-year-old girl who was diagnosed with autism spectrum disorder when she was 3 years old. Emma was reported to have an IQ within the Average range. Emma has limited verbal skills only speaking 1-2 word phrases. Emma's mom reports she will often hit others to get what she wants. When Emma is around other children, she does not typically initiate interactions, unless the child has something she wants. She then will either push the other child or take the item from the child. If an adult prompts physical play (i.e., chase or catch) Emma will engage without problem behavior, but will only engage for about 5 minutes, and then walks away to play alone. Emma does make eye contact with her peers, and will engage in parallel play for 10 minute intervals.

Henry is a 4-year old boy who was diagnosed with autism spectrum disorder when he was 3. Henry has an IQ score within the Average range. Henry only talks with people with whom he is familiar, typically family members. Henry is home-schooled due to his behaviors at school. When Henry was enrolled in school, he would disrobe to escape a demand situation. When approached by peers, Henry would begin laughing and coughing uncontrollably and would not speak to the other children. These behaviors often resulted in peers walking away from Henry. When prompted by an adult to engage with peers, Henry would cry and scream. Henry does not make eye contact with peers and will not approach peers. Henry's independent play is described by reading books, or most often, holding dolls and waving them back and forth.

APPENDIX D**Scenario Assessment Items**

Based on the scenario you just read, please rank the order in which you would use the tools below from 1-12 with 1 being most likely to use and 12 being least likely to use. To select a tool, click on it and move it to the place in order you want.

- _____ Adaptive Behavior Assessment System- ABAS
 - _____ Assessment of Basic Language and Learning Skills – Revised- ABLLS- R
 - _____ Assessment of Functional Living Skills- AFLS
 - _____ Bayley Scales of Infant and Toddler Development - Bayley III
 - _____ Developmental Assessment of Young Children- DAYC
 - _____ Leiter International Performance Scale – Leiter
 - _____ Peabody Picture Vocabulary Test- PPVT
 - _____ Promoting the Emergence of Advanced Knowledge Relational Training System - Direct Training Module- PEAK- DT
 - _____ Verbal Behavior Milestones Assessment & Placement Program- VB-MAPP
 - _____ Vineland Adaptive Behavior Scales- VABS
 - _____ Wechsler Intelligence Scale for Children- WISC
 - _____ Wechsler Preschool and Primary Scale of Intelligence- WPPSI
-

Module- PEAK-
DT

9. Verbal
Behavior
Milestones
Assessment &
Placement
Program- VB-
MAPP



10. Vineland
Adaptive
Behavior Scales-
VABS



11. Wechsler
Intelligence
Scale for
Children- WISC



12. Wechsler
Preschool and
Primary Scale of
Intelligence-
WPPSI



APPENDIX E**Informed Consent Letter**

Dear Participant,

By clicking yes, you agree to participate in the following study. You will not be asked to give any information that would pose a risk to your health or welfare. No identifiable information will be collected. Your participation in this study is voluntary and you can choose to withdraw from the study at any time without consequences. In this study, you will be asked to rank assessment tools based on your experience as a professional and then read two short scenarios and rank the utility and likelihood of using each tool. Please take this survey only one time. If you have any questions or concerns about the study you may contact the researchers by email (Mcm7@mtmail.mtsu.edu or kimberly.ward@mtsu.edu). You may also contact the MTSU's Office of Research Compliance by email (irb_information@mtsu.edu). Thank you for your time and participation.

Yes

No

APPENDIX F**MTSU IRB Approval Letter****IRB****INSTITUTIONAL REVIEW BOARD**

Office of Research
Compliance, 010A Sam
Ingram Building, 2269
Middle Tennessee Blvd
Murfreesboro, TN 37129

**IRBN007 – EXEMPTION DETERMINATION NOTICE**

Friday, March 02, 2018

Investigator(s): Mary Mathewson; Kim Ujcich Ward

Investigator(s) Email(s): mcm7q@mtmail.mtsu.edu; kimberly.ward@mtsu.edu

Department: Psychology

Study Title: ASSESSMENTS USED BY BOARD CERTIFIED
BEHAVIOR ANALYSTS FOR CHILDREN WITH
AUTISM SPECTRUM DISORDER AND SOCIAL
BEHAVIOR DEFICITS

Protocol ID: 18-1195

Dear Investigator(s),

The above identified research proposal has been reviewed by the MTSU Institutional Review Board (IRB) through the **EXEMPT** review mechanism under 45 CFR 46.101(b)(2) within the research category (2) *Educational Tests*. A summary of the IRB action and other particulars in regard to this protocol application is tabulated as shown below:

IRB Action	EXEMPT from further IRB review***	
Date of expiration	NOT APPLICABLE	
Participant Size	200 [Two Hundred]	
Participant Pool	Adults 18+	
Mandatory Restrictions	1. Participants must be age 18+ 2. Informed consent must be obtained 3. Identifying information may not be collected	
Additional Restrictions	NONE	
Comments	NONE	
Amendments	Date	Post-Approval Amendments
	NONE	

***This exemption determination only allows above defined protocol from further IRB review such as continuing review. However, the following post-approval requirements still apply:

- Addition/removal of subject population should not be implemented without IRB approval
- Change in investigators must be notified and approved
- Modifications to procedures must be clearly articulated in an addendum request and the proposed changes must not be incorporated without an approval
- Be advised that the proposed change must comply within the requirements for exemption
- Changes to the research location must be approved – appropriate permission letter(s) from external institutions must accompany the addendum request form
- Changes to funding source must be notified via email (irb_submissions@mtsu.edu)
- The exemption does not expire as long as the protocol is in good standing
- Project completion must be reported via email (irb_submissions@mtsu.edu)
- Research-related injuries to the participants and other events must be reported within 48 hours of such events to compliance@mtsu.edu

The current MTSU IRB policies allow the investigators to make the following types of changes to this protocol without the need to report to the Office of Compliance, as long as the proposed changes do not result in the cancellation of the protocols eligibility for exemption:

- Editorial and minor administrative revisions to the consent form or other study documents
- Increasing/decreasing the participant size

The investigator(s) indicated in this notification should read and abide by all applicable post-approval conditions imposed with this approval. Refer to the post-approval guidelines posted in the MTSU IRB's website. Any unanticipated harms to participants or adverse events must be reported to the Office of Compliance at (615) 494-8918 within 48 hours of the incident.

All of the research-related records, which include signed consent forms, current & past investigator information, training certificates, survey instruments and other documents related to the study, must be retained by the PI or the faculty advisor (if the PI is a student) at the secure location mentioned in the protocol application. The data storage must be maintained for at least three (3) years after study completion. Subsequently, the researcher may destroy the data in a manner that maintains confidentiality and anonymity. IRB reserves the right to modify, change or cancel the terms of this letter without prior notice. Be advised that IRB also reserves the right to inspect or audit your records if needed.

Sincerely,

Institutional Review Board
Middle Tennessee State University