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An Analysis of Training Tasks, Maladaptive Behaviours, and Rates of Task Acquisition Based on Archived Data From an Early Intensive Behavioural Intervention Program

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Abstract

This study, conducted in two parts, evaluated whether the difficulty of the training tasks taught to children enrolled in the St.Amant Autism Early Learning Program matched the learning abilities of the children. In the first part, we demonstrated that: (I) Trained observers could reliably categorize 99 of the 544 tasks of the Assessment of Basic Language and Learning Skills – Revised (ABLLS-R) into individual levels of the Assessment of Basic Learning Abilities – Revised (ABLA-R); and (II) Autism consultants from the St.Amant autism programs averaged 90.5% agreement that those ABLLS-R tasks were taught at the categorized ABLA-R levels. In the second part, we examined archived data for 14 children from the St.Amant Autism Early Learning Program. We found that: (III) 81% of each child's ABLLS-R training tasks were mismatched to each child's highest-passed ABLA-R level; (IV) 61% of their assessments of maladaptive behaviours had a score indicative of challenging behaviours; and (V) The children's rates of acquisition of new training tasks were lower for mismatched tasks than for matched tasks. This study provides valuable information for service providers to improve early intensive behavioural intervention programs for children with autism spectrum disorder.

Research has established early intensive behavioural intervention (EIBI) as the treatment of choice for young children with autism spectrum disorder (ASD) (Martin & Pear, 2015; Matson & Konst, 2013; Matson & Smith, 2008; Matson & Sturmey, 2011). A commonly used curriculum guide in EIBI programs for children with ASD is the Assessment of Basic Language and Learning Skills-Revised (ABLLS-R; Partington, 2006), which is used as an assessment, a curriculum guide, and skills tracking system. Table 1 illustrates the types of skills and descriptions that can be found in the ABLLS-R manual.

Another assessment that is used in some EIBI programs with children with ASD is the Assessment of Basic Learning Abilities (ABLA; Kerr et al., 1977), which assesses a testee's ability to learn six discriminations, referred to as levels. The ABLA was revised in 2011 to include a new Level 5 task, and is now referred to as the Assessment of Basic Learning Abilities-Revised, or ABLA-R (DeWiele, Martin, Martin, Yu, & Thomson, 2011; see Table 2). Research on the original ABLA and ABLA-R has demonstrat-

Table 1. Examples of Tasks From the ABLLS-R Identified for the Cooperation and Reinforcer Effectiveness Skill (A)

Task	*Task Name*	*Task Objective*	*Question*	*Examples*
A1	Take reinforcer when offered	When offered a known reinforcing item or activity, the student will take/use the item or activity.	When you hold out and offer a known reinforcer, will the student take the reinforcer?	M & M taken and eaten
A2	Take a reinforcer from two choices of items	When offered one reinforcing item or activity and another non-reinforcing item or activity, the student will select the reinforcing item or activity.	When you hold out and offer a reinforcer and a non-reinforcing item, will the student take the reinforcer?	M & M vs. shoe, will take M & M
A3	Look at a non-reinforcing item	Student will look and track changes in location of a non-reinforcing item presented by an instructor.	If you hold up a non-reinforcing item, will the student look at it and watch it as you move it to different locations in front of the student?	When you hold up a shoe and ask the student to look at the shoe, student will look at it and watch it as you move it to a variety of positions in front of him (e.g., up/down/left/right)
A4	Take common object when offered	When offered a common object, the student will take the item.	When you hold out and offer an item, will the student take the object?	When you hold out a shoe, student will take it

Note: Reprinted with permission from "The Assessment of Basic Language and Learning Skills – Revised (ABLLS-R protocol)" by J. W. Partington, 2006, Pleasant Hill, CA: Behavior Analysts, Inc.

ed, with persons with intellectual disabilities (ID) and children with ASD, that: (a) The six levels are ordered in difficulty from Level 1 (easiest) to Level 6 (most difficult); (b) training tasks can be analyzed according to the highest ABLA level needed to perform them; and (c) ABLA test performance can be used to match the learning ability of participants to training tasks (DeWiele & Martin, 1996; Martin, Thorsteinsson, Yu, Martin, & Vause, 2008; Murphy, Martin, & Yu, 2014; Schwartzman et al., 2009; Yu, Martin, Vause, & Martin, 2015). Research has also demonstrated, with persons with ID, that the ABLA difficulty of training tasks that are matched to a client's highest-passed ABLA level results in fewer aberrant behaviours than tasks that are mismatched to that client's highest-passed ABLA level (Vause et al., 2000; Vause, Martin, & Yu, 1999). Does this latter finding hold for children with ASD? Given the increasing prevalence of ASD and the limited availability of qualified service providers, it is critical that we evaluate whether children's training curricula are designed to ensure rapid acquisition of a variety of skills while decreasing levels of aberrant behaviours.

To address this question, research was conducted at the St.Amant Autism Early Learning Program, a large community-based EIBI program based in Winnipeg. The program offers up to 3 years of EIBI services to children with ASD, and serves a large number of children with ASD across Manitoba. This program was selected as it uses both the ABLLS-R and ABLA-R. These assessments are conducted on a 6-month or yearly basis for all children to measure skill acquisition, learning ability, and challenging behaviours.

Table 2. A Description of the ABLA and ABLA-R Levels and the Types of Discriminations Required

ABLA Level	*Test Task*	*Everyday Examples*
Level 1 Imitation	When given a piece of foam, can the student imitate the teacher placing the foam into a container?	Children playing Follow-the-Leader.
Level 2 Position Discrimination	When presented with a yellow can and a red box in a stable position, can a student consistently place a piece of foam into the container on the left?	Turning on the cold (vs. the hot) water tap.
Level 3 Visual Discrimination	When presented with a yellow can and a red box in randomly alternated left-right positions, can a student consistently place a piece of foam into the can?	Locating own printed name on blackboard when placed in different positions with other names.
Level 4 Visual Identity Match-to-Sample Discrimination	When presented with a yellow can and a red box in randomly alternated left-right positions, can a student consistently place a small yellow cylinder into the can, and a small red cube into the box?	Sorting socks into pairs.
Original Level 5 Auditory Discrimination	When presented with a yellow can and a red box (in fixed positions), can a student consistently place a piece of foam in the appropriate container when the teacher randomly says, "red box" or "yellow can"?	Responding appropriately to requests such as, "fork" vs. "spoon," when both are in a consistent location on either side of a plate.
New Level 5 Visual Non-Identity Match-to-Sample Discrimination	When presented with a yellow can and a red box in randomly alternated left-right positions, can a student consistently place a purple-coloured piece of wood shaped like the word *Can* into the can, and a piece of silver-coloured wood shaped like the word *BOX* into the box?	Placing a cup with a saucer.
Level 6 Auditory-Visual Combined Discrimination	When presented with a yellow can and a red box in randomly alternated left-right positions, can a student consistently place a piece of foam into the correct container when the teacher requests either "red box" or "yellow can"?	Responding appropriately to requests such as, "pass the salt" vs. "pass the pepper" when the salt and pepper shakers are in different places on the table from meal to meal.

Note: Reprinted with permission from "The Kerr Meyerson Assessment of Basic Learning Abilities Revised: A Self-Instructional Manual (second edition)" by L. DeWiele, G. L. Martin, T. Martin, C.T. Yu, and K. Thomson, 2011, Winnipeg, MB: St.Amant Research Centre.

To evaluate whether the difficulty of the training tasks taught to children enrolled in the St.Amant Autism Early Learning Program matched the learning abilities of the children, five different questions were examined in two parts. In the first part, two questions were examined: (I) Can observers who are knowledgeable about the ABLA-R reliably categorize each of the 544 tasks of the ABLLS-R into an ABLA-R level per task? and (II) For the ABLLS-R tasks that were reliably categorized into ABLA-R levels, do autism consultants from the St.Amant autism programs typically teach each of those ABLLS-R tasks at the ABLA-R levels into which they have been categorized? Information gathered in the first part allowed us to proceed with the second part of the study. In the second part, we examined three addition-

al questions: (III) Based on archived data for a sample of children from the St.Amant Autism Early Learning Program, to what extent did the ABLA-R difficulty level of ABLLS-R training tasks match the learning abilities of the children as assessed by the ABLA-R? (IV) For those children, was there a relation between the proportions of training tasks mismatched to the children's highest-passed ABLA-R levels and their maladaptive behaviour scores? and (V) For those children, was there correspondence between the children's proportions of mismatched tasks and their rates of acquisition of new training tasks?

PART I

Question I: Can the 544 Training Tasks of the ABLLS-R be Categorized into Assessment Levels of the ABLA-R?

Materials and Methods

To answer this question, three undergraduate psychology students were recruited and given forms and instructions to follow for the categorization of each of the 544 tasks. For each task, they were asked to read the task description as outlined in the ABLLS-R manual, compare the task to the ABLA-R level descriptions that were provided, and identify whether the task was categorizable according to one of the ABLA-R levels, or whether the task was non-categorizable (Roy-Wsiaki, 2016). A categorization was defined as an agreement if the observers assigned the same ABLA-R level to a task; otherwise, the categorization was defined as a disagreement. In addition, a task was labelled as categorizable if it was found to closely approximate one of the six ABLA-R levels; otherwise, the task was labelled as non-categorizable. With this process, we progressively eliminated ABLLS-R tasks that did not closely match any of the ABLA-R levels, eliminated ABLLS-R tasks that could not be reliably categorized into one of the ABLA-R levels, and finally, identified ABLLS-R tasks that could be reliably categorized according to the highest ABLA-R level needed to perform them.

Results

Overall, 439 tasks were identified as non-categorizable and 99 tasks were agreed categorizable with substantial agreement based on a kappa coefficient of 0.7601 (Cohen, 1968). Six tasks were used for training purposes, and therefore not included in the categorizations. All 99 tasks agreed categorizable were reliably assigned a corresponding ABLA-R level, with 35 tasks categorized as Level 1, five tasks categorized as Level 2, three tasks categorized as Level 3, 24 tasks categorized as Level 4, 13 tasks categorized as Level 5, and 19 tasks categorized as Level 6. Table 3 lists the 99 ABLLS-R tasks categorized according to ABLA-R levels. With these 99 tasks, we proceeded with the second question.

Question II: For ABLLS-R Tasks Categorized at ABLA-R Levels, Are They Typically Taught at Those Levels by St.Amant Staff?

Materials and Methods

To address this question, we created the Fidelity of Training Programs Survey. From the 99 categorized ABLLS-R tasks, we randomly selected two ABLLS-R tasks from those categorized at ABLA-R Level 1, two tasks from those categorized at Level 2, and so on for the ABLLS-R tasks at each ABLA-R level, for a total of 12 tasks. We then created a survey question for each task, with the objective of evaluating whether autism consultants who work for the St.Amant autism programs develop training programs based on the guidelines in the ABLLS-R manual. Each question prompted the autism consultants to review an ABLLS-R task that was categorized into an ABLA-R level, and to answer "Yes" or "No," as to whether they developed their programs based on the descriptions (or guidelines) provided. The descriptions for each ABLLS-R task (i.e., task objective, question, example) were obtained from the ABLLS-R manual. For a sample of two of the 12 survey questions, see Figure 1 on page 34.

The survey was administered at St.Amant, during an autism programs' team meeting. On that day, 16 of the 18 autism consultants were present. Autism consultants who wished to

Table 3. ABLLS-R Task Categorizations With Substantial Agreement on the ABLA-R Level of Each Task Based on Kappa

ABLA-R level	*Categorized ABLLS-R tasks*											
Level 1	B20	D1	D2	D3	D4	D5	D6	D7	D8	D9	D10	D11
	D12	D13	D14	D15	D16	D17	D18	D19	D20	D21	D22	D23
	D24	D26	D27	L8	L9	N6	R1	R3	T3	Z26	Z28	
Level 2	B12	C10	C11	Z2	Z6							
Level 3	A3	B21	Q9									
Level 4	B1	B2	B3	B4	B5	B6	B7	B8	B9	B13	B15	C55
	Q1	Q2	Q6	Q8	T2	T4	Z3	Z4	Z5	Z7	Z20	Z22
Level 5	B10	B11	B16	B17	B18	B19	B23	B24	C24	C36	C56	Q5
	Z23											
Level 6	C12	C13	C14	C16	C17	C32	C35	C40	C45	C47	C48	
	N8	Q3	R9	R10	R11	R12	R13	R15				

complete the survey and who had provided their consent to participate were given 15 minutes to complete the survey. Procedures were implemented to ensure that completion of the survey remained voluntary and anonymous.

Results

A total of 14 surveys were completed, and two surveys were returned incomplete. For each question on the survey, a checked "Yes" was interpreted as an agreement with the question, and a checked "No" was interpreted as a disagreement with the question. Summarized data demonstrated an average of 90.5% agreement across autism consultants, with percent agreement ranging from 75% to 100% (see Table 4 on page 35).

These results indicate that in general, training programs were developed based on the guidelines in the ABLLS-R manual, and more specifically, there was an average of 90.5% agreement that the categorized ABLLS-R tasks were taught at their respective ABLA-R levels.

PART II

Question III: What Percentage of Training Tasks Were Taught At, Below, and Above Each Child's Highest-Passed ABLA-R Level?

Materials and Methods

To answer this question, as well as the next two questions, existing client data was obtained from the St.Amant Autism Early Learning Program archival database for 14 children who met the inclusion criteria. Inclusion criteria involved available archived assessment data for the ABLA-R and the Scales of Independent Behavior-Revised (SIB-R; Bruininks, Woodcock, Weatherman, & Hill, 1996), as well as the ABLLS-R training task databases. Assessment periods selected for this study were limited to Year 1, Year 1.5, and Year 2, such that the children who had all required data for any of these three assessment periods met the inclusion criteria.

Fidelity of Training Programs Survey

BACKGROUND: In an earlier phase of my study, reliability assessments were conducted to categorize ABLLS-R tasks into ABLA-R levels. We were successful in categorizing 99 ABLLS-R tasks.

PURPOSE: The purpose of this survey is to assess whether autism consultants develop training programs based on the guidelines in the ABLLS-R manual.

INSTRUCTIONS: Please read each question and ABLLS-R task description carefully. For each question, check either YES or NO.

2. For the ABLLS-R task below, do you typically develop a program to teach the task as outlined in the description below, and therefore as an ABLA-R Level 1 task? Meaning that the desired behaviour is modeled before the response occurs, and involves an imitation.

YES _____ NO _____

Task	Task Name	Task Objective	Question	Example
D4	Imitation of leg and foot movements	Upon request, student will imitate a gross motor activity involving foot and leg movements.	Will the student imitate a gross motor action involving foot and leg movements when asked to "Do this"?	Stomp foot

8. For the ABLLS-R task below, do you typically develop a program to teach the task as outlined in the description below, and therefore as an ABLA-R Level 4 task? Meaning that the task involves visually matching something to something else in the environment on the basis that the two matching items are the same on at least one physical dimension.

YES _____ NO _____

Task	Task Name	Task Objective	Question	Example
Q8	Match individual letters to letters on word card	The student will be able to match individual letters to the letters on cards with single 5 letters words.	Can the student match individual letters to the letters on cards with single 5 letter words?	Given a word card with the word "train," the student will match individual letter cards to the letters on the word card

Figure 1. The instructions and two questions (#2 and #8) from the Fidelity of Training Programs Survey that contains 12 questions. Task descriptions adapted with permission from "The Assessment of Basic Language and Learning Skills-Revised (ABLLS-R protocol)" by J. W. Partington, 2006, Pleasant Hill, CA: Behavior Analysts, Inc.

Table 4. Individual and Summarized Results of Survey Completed by Autism Consultants From the St.Amant Autism Programs

	Survey Question												Agreement	
Participant	*1*	*2*	*3*	*4*	*5*	*6*	*7*	*8*	*9*	*10*	*11*	*12*	*Number*	*Percent*
1	1	1	1	1	1	1	1	1	1	1	1	1	12	100%
2	1	1	1	1	1	1	1	1	1	1	1	1	12	100%
3	1	1	1	1	1	1	1	1	1	1	1	1	12	100%
4	1	1	1	1	1	1	1	1	1	1	1	1	12	100%
5	1	1	1	1	1	1	1	1	1	1	1	1	12	100%
6	1	1	1	1	1	1	1	1	1	1	1	0	11	92%
7	1	1	1	1	1	1	1	1	1	1	0	1	11	92%
8	1	1	1	1	1	0	1	1	1	1	1	1	11	92%
9	1	1	1	1	1	1	1	1	1	1	1	0	11	92%
10	1	1	1	1	1	1	1	0	0	1	1	1	10	83%
11	1	1	1	1	1	0	1	1	1	1	1	0	10	83%
12	1	1	1	1		1	1		1	1	1	1	10	83%
13	1	1				1	1	1	1	1	1	1	9	75%
14	0	1	1	0	1	0	1	1	1	1	1	1	9	75%
Total average													11	90.5%

Note: 1 = "Yes" or agreement, and indicates that the ABLLS-R task described in the survey question was taught at its categorized ABLA-R level; 0 = "No" or disagreement, and indicates that the ABLLS-R task described in the survey question was not taught at its categorized ABLA-R level; blank = no response.

For all those 14 children, we analyzed each of their archived data for any given assessment period in the following manner. First, we compared each child's ABLA-R assessments to his or her ABLLS-R training task database, to ensure the dates for a particular assessment period corresponded to tasks that were taught within 1 month prior to the assessment dates.

Second, we identified within the 1 month of training task data, those tasks that corresponded to the 99 ABLLS-R tasks that were reliably categorized according to the highest ABLA-R level needed to perform them, in Part I. This provided a list of training tasks and their respective ABLA-R levels.

Third, we compared this list to the ABLA-R score for that assessment period, to identify the training tasks that were *at* the child's highest-passed ABLA-R level, *below* that ABLA-R level, and *above* that ABLA-R level. A task at the child's highest-passed ABLA-R level signified that the task's categorized ABLA-R level was identical to the child's highest-passed ABLA-R level, and was therefore labelled a "match." A task below or above the child's highest-passed ABLA-R level was labelled a "mismatch."

Fourth, we determined the percentage of tasks taught at, below, and above each child's highest-passed ABLA-R level by calculating the number of tasks matched or mismatched divided by the total number of tasks. For specific mismatched percentages, we divided the number of tasks mismatched below or mismatched above by the total number of mismatched tasks.

Results

Data was analyzed for a total of 31 assessment periods and 1006 tasks (including each task's respective exemplars). The number of tasks per child ranged from 6 to 84, with an average of 32 tasks per child. Overall, results demonstrated

that an average of 19% of tasks were matched and 81% of tasks were mismatched to the children's highest-passed ABLA-R levels. Of those mismatched tasks, 64% were mismatched below the children's highest-passed ABLA-R levels, and 36% were mismatched above the children's highest-passed ABLA-R levels. Table 5 presents each child's specific percentages.

Question IV: What Was the Relationship Between the Proportions of Matched Versus Mismatched Tasks and Maladaptive Behaviour Scores?

Materials and Methods

Children's maladaptive behaviour scores reflected the scores of the SIB-R which is a comprehensive, norm-referenced assessment of 14 areas of adaptive behaviours and eight areas of maladaptive behaviours. For the purposes of this study, the General Maladaptive Index (GMI) composite score was chosen as the measure of maladaptive behaviour for each child.

For all 14 children and across their 31 assessment periods, we obtained an SIB-R GMI score. We then referred to the SIB-R Maladaptive Behavior Indexes Profile to assign a corresponding label to each score (i.e., Normal, Marginally serious, Moderately serious, Serious, or Very serious). Any score other than what was considered normal was recognized as a score representative of maladaptive behaviours. Finally, we compared the children's maladaptive behaviour scores to their proportions of matched and mismatched tasks (Table 6).

Results

Across 31 SIB-R assessments, 12 assessments (39%) demonstrated normal behaviour scores and 19 assessments (61%) demonstrated maladaptive behaviour scores. A correlation measure was used to evaluate whether there was a relation between the proportions of training tasks mismatched to the children's highest-passed ABLA-R levels and their maladaptive behaviour scores. Based on previous research (e.g., Vause et al., 1999), my hypothesis was that more maladaptive behaviours would be found for children who were presented with a larger number of mismatched tasks versus tasks matched to their highest-passed ABLA-R level. A Pearson product-moment correlation was tested between average percentages of matched tasks and average maladaptive behaviour scores across 12 children (for whom a percentage of tasks matched their ABLA-R level). Each child's average percentage of tasks or average maladaptive behaviour score was calculated by averaging the data across his or her respective assessment periods. Results demonstrated that the relationship of average maladaptive behaviour scores with matched tasks (r = -.436, p = .157) was not statistically significant at a p value of .05, possibly due to sample size restrictions. However, this p value suggests that children may engage in fewer or less intensive maladaptive behaviours when presented with tasks that match their highest-passed ABLA-R level. The same test was conducted between average percentages of mismatched tasks and average maladaptive behaviour scores across all 14 children. Results for mismatched tasks (r = -.047, p = .873) also lacked statistical significance at a p value of .05. Nevertheless, 11 of the 14 children demonstrated a varying degree of maladaptive behaviour, and these behaviours may very well interfere with the children's ability to learn and acquire valuable skills. See Table 6 on page 38 for each child's respective maladaptive behaviour scores.

Question V: What Was the Relationship Between the Proportions of Matched Versus Mismatched Tasks and Rates of Task Acquisition?

Materials and Methods

Trial-by-trial data is consistently collected for ABLLS-R training tasks taught during instruction sessions in the St.Amant autism programs. Consequently, the fifth question was examined by using a trials-to-criterion measure. An average rate of training task acquisition was obtained by calculating, for each child, the total number of trials required to meet the mastery criterion

Table 5. Percentage of Tasks At, Below, and Above Each Child's Highest-Passed ABLA-R Level

				Percentage of Tasks			
Participant	*Assessment period*	*ABLA-R level*	*Number of tasks*	*Matched*	*Mismatched*	*Mismatched below*	*Mismatched above*
1	1	6	38	0%	100%	100%	0%
	2	6	14	43%	57%	100%	0%
2	1	3	19	0%	100%	58%	42%
	1.5	6	50	0%	100%	100%	0%
	2	6	49	22%	78%	100%	0%
3	1	4	20	50%	50%	30%	70%
4	1	2	17	0%	100%	29%	71%
	1.5	2	19	0%	100%	58%	42%
	2	3	21	5%	95%	20%	80%
5	1	1	22	68%	32%	0%	100%
	2	3	35	3%	97%	71%	29%
6	1	4	84	49%	51%	65%	35%
	1.5	4	35	11%	89%	55%	45%
	2	6	55	5%	95%	100%	0%
7	1	4	74	1%	99%	25%	75%
	2	6	36	17%	83%	100%	0%
8	1	3	58	0%	100%	36%	64%
	1.5	3	26	0%	100%	50%	50%
	2	3	26	0%	100%	69%	31%
9	1	4	31	39%	61%	32%	68%
	1.5	6	33	0%	100%	100%	0%
	2	6	10	30%	70%	100%	0%
10	1	4	42	12%	88%	51%	49%
	1.5	4	24	21%	79%	58%	42%
	2	4	29	14%	86%	96%	4%
11	1.5	4	6	0%	100%	50%	50%
12	1	4	18	22%	78%	79%	21%
13	1	4	42	52%	48%	80%	20%
	2	4	38	45%	55%	90%	10%
14	1	4	23	52%	48%	27%	73%
	2	4	12	42%	58%	57%	43%
Total			1006				
Average			32	19%	81%	64%	36%

Note: The children's original test scores were based on the ABLA.

Table 6. Summary of Percentage of Matched and Mismatched ABLLS-R Tasks With SIB-R GMI Scores and Profiles Across Assessment Periods

		Percentage of Tasks					
Participant	*Assessment period*	*Matched*	*Mismatched*	*Mismatched below*	*Mismatched above*	*SIB-R GMI score*	*Index profile*
1	1	0%	100%	100%	0%	-4	Normal
	2	43%	57%	100%	0%	-21	Moderately serious
2	1	0%	100%	58%	42%	-4	Normal
	1.5	0%	100%	100%	0%	-3	Normal
	2	22%	78%	100%	0%	-4	Normal
3	1	50%	50%	30%	70%	-14	Marginally serious
4	1	0%	100%	29%	71%	-11	Marginally serious
	1.5	0%	100%	58%	42%	-26	Moderately serious
	2	5%	95%	20%	80%	-33	Serious
5	1	68%	32%	0%	100%	-32	Serious
	2	3%	97%	71%	29%	-24	Moderately serious
6	1	49%	51%	65%	35%	-18	Marginally serious
	1.5	11%	89%	55%	45%	-17	Marginally serious
	2	5%	95%	100%	0%	-15	Marginally serious
7	1	1%	99%	25%	75%	1	Normal
	2	17%	83%	100%	0%	-6	Normal
8	1	0%	100%	36%	64%	-35	Serious
	1.5	0%	100%	50%	50%	-9	Normal
	2	0%	100%	69%	31%	-32	Serious
9	1	39%	61%	32%	68%	-16	Marginally serious
	1.5	0%	100%	100%	0%	-12	Marginally serious
	2	30%	70%	100%	0%	-8	Normal
10	1	12%	88%	51%	49%	-6	Normal
	1.5	21%	79%	58%	42%	-9	Normal
	2	14%	86%	96%	4%	-10	Normal
11	1.5	0%	100%	50%	50%	-52	Very serious
12	1	22%	78%	79%	21%	-18	Marginally serious
13	1	52%	48%	80%	20%	-2	Normal
	2	45%	55%	90%	10%	-20	Marginally serious
14	1	52%	48%	27%	73%	-42	Very serious
	2	42%	58%	57%	43%	-38	Serious
Average		19%	81%	64%	36%	-17	Marginally serious

Note: GMI = General Maladaptive Index. The maladaptive behaviour index values are interpreted in the SIB-R as follows: +10 to -10 = Normal; -11 to -20 = Marginally serious; -21 to -30 = Moderately serious; -31 to -40 = Serious; -41 and below = Very serious.

(i.e., criterion that demonstrates understanding of the task) divided by the total number of tasks.

For all 14 children and across 30 assessment periods, we obtained trials-to-criterion data for a total of 462 mastered tasks (including each task's respective exemplars) corresponding to the 99 ABLLS-R tasks from Part I. With this trials-to-criterion data, we calculated the number of trials required to achieve the mastery criterion for each task. For each child, we then proceeded in calculating the average number of trials required to achieve the mastery criterion for tasks that matched the child's highest-passed ABLA-R level, and tasks that were a mismatch below and above the child's ABLA-R level. The average number of trials was calculated by dividing the total number of trials, corresponding to tasks matched, mismatched below, or mismatched above the child's highest-passed ABLA-R level, by the total number of tasks.

Results

Results demonstrated that children required an average of 25 trials to master tasks matched to their highest-passed ABLA-R level, and 42 trials to master tasks mismatched to their ABLA-R level. More specifically, children required an average of 47 trials to master tasks mismatched below their highest-passed ABLA-R level, and 34 trials to master tasks mismatched above their ABLA-R level. A paired-samples *t*-test was conducted to compare average rates of acquisition for matched versus mismatched tasks (n = 9). Results demonstrated that there was no significant difference in rates of acquisition between matched tasks (M = 32.77, SD = 32.65) and mismatched tasks (M = 52.73, SD = 36.95); $t(8) = 1.267$, $p = .241$. Again, this may have been due to the limited sample of data. However, based on the average rates of acquisition reported above, lower rates of acquisition were found for mismatched tasks, and overall, children in this sample were presented with a larger number of tasks that were mismatched to their ability levels. Table 7 on page 40 presents the children's individual rates of acquisition.

Discussion

In Part I of this study, we first examined whether observers who are knowledgeable about the ABLA-R could reliably categorize each of the tasks of the ABLLS-R into an ABLA-R level per task. Observers agreed that a total of 439 tasks were non-categorizable, meaning that those tasks did not fit any of the predetermined ABLA-R guidelines, and a total of 99 tasks were categorizable. These categorizations were confirmed reliable with substantial agreement based on Kappa.

This study represents the first attempt to reliably categorize the 544 ABLLS-R training tasks according to an ABLA-R level per task. The finding that 99 tasks were agreed upon by observers as categorizable represents a contribution of practical significance, given that EIBI programs often use the ABLLS-R as a skills tracking system and curriculum guide, and some use the ABLA-R as a learning assessment tool. When comparing the list of 99 categorized ABLLS-R tasks to the ABLA-R level descriptions, staff working with children with ASD may find it easier to develop programs that are appropriate for the children's learning ability levels, and thereby reduce potential frustration or number of trials required to master tasks or skills.

A potential limitation is that although 99 ABLLS-R tasks were reliably categorized according to the highest ABLA-R level needed to perform them, 439 tasks were left non-categorizable. Therefore, staff working with children with ASD may be limited in the comparisons they are able to make between ABLLS-R tasks and ABLA-R levels for any given child. Future research might examine the use of additional possible ABLA-R levels (e.g., auditory-auditory identity matching; Harapiak, Martin, & Yu, 1999; Marion et al., 2003) to categorize the ABLLS-R tasks, so that more tasks may be reliably categorized into ABLA-R levels.

We then examined whether autism consultants from the St.Amant autism programs typically taught a random sample of those 99 ABLLS-R tasks at the ABLA-R levels into which they were categorized. Results indicated there was an average agreement of 90.5% that the categorized ABLLS-R tasks were taught at their respective ABLA-R levels. This outcome contributes important information with regards to EIBI and evaluations of procedural fidelity, as it is often difficult in large EIBI meta-analysis studies to confirm that treatment and other procedures are delivered as described.

Table 7. Average Rates of Acquisition for Tasks Matched, Mismatched Below, and Mismatched Above the Children's Highest-Passed ABLA-R Levels

		Average Rate of Acquisition		
Participant	*Assessment period*	*Tasks matched to ABLA level*	*Tasks below ABLA level*	*Tasks above ABLA level*
1	1		18	
	2	8	33	
2	1		22	31
	1.5			
	2	6	74	
3	1	26	29	
4	1		4	3
	1.5		25	60
	2			39
5	1			31
	2		178	
6	1	3	15	39
	1.5		38	168
	2		30	
7	1		38	11
	2		29	
8	1		208	15
	1.5		100	
	2		95	19
9	1	14	32	43
	1.5		30	
	2		29	
10	1	73	52	9
	1.5	16	70	67
	2	113	64	
11	1.5		85	46
12	1	96	61	
13	1	44	15	
	2	79	80	5
14	1	20		1
	2		48	485

Although the autism consultants showed very high agreement that the 12 ABLLS-R tasks on the survey were taught at their respective ABLA-R levels, future research might examine whether autism consultants follow the ABLLS-R guidelines for all 99 categorized tasks. Future research might also conduct a more thorough procedural fidelity evaluation, by obtaining and comparing specific training programs to their corresponding ABLLS-R task descriptions. Furthermore, future research might examine the extent to which autism tutors follow program procedures as written by the autism consultants.

In Part II of this study, we examined to what extent the ABLA-R difficulty level of ABLLS-R training tasks matched the learning abilities of the children as assessed by the ABLA-R. Results demonstrated that an average of 19% of tasks were matched and 81% of tasks were mismatched to the children's highest-passed ABLA-R levels. Of those mismatched tasks, 64% were mismatched below the children's ABLA-R levels, and 36% were mismatched above the children's ABLA-R levels. Given that children in these types of programs generally obtain services for a limited amount of years, it is crucial that staff quickly identify and develop training programs that are appropriate for a child's ability level, at any given point in time. Doing so may increase the effectiveness of instruction sessions, and in turn, children may learn at a faster rate a larger number of skills that are required for daily functioning and integration into school and other occupational areas. Future research might examine whether additional staff training on the use of assessments (e.g., the ABLLS-R and the ABLA-R) may improve the development of training programs to ensure a better match of training tasks to the children's ability levels.

We then examined whether there was a relation between the proportions of training tasks mismatched to the children's highest-passed ABLA-R levels and their maladaptive behaviour scores. Overall results demonstrated that 12 assessments (39%) demonstrated normal behaviour scores and 19 assessments (61%) demonstrated maladaptive behaviour scores. A limitation was that it was not possible to determine with certainty that the SIB-R scores indicative of maladaptive behaviours were directly related to the presentation of mismatched tasks. First, there was no statistically significant relationship found between the maladaptive behaviour scores and the proportions of tasks mismatched to the children's ABLA-R levels. Second, given that the maladaptive behaviour scores were based on archived data, there were no direct observations to demonstrate that the presentation of mismatched tasks caused the increase in maladaptive behaviours for these children. It is also important to note that because the SIB-R is generally completed by parents or legal guardians based on their own perceptions of their child's behaviour, the results may lack accuracy and they may be influenced by other events or situations that may have occurred near the assessment dates. Consequently, future studies may look at conducting direct observations or identifying a more objective measure of maladaptive behaviour (e.g., a functional analysis or functional assessment conducted within a particular period).

Finally, we examined whether there was correspondence between the children's proportions of mismatched tasks and their rates of acquisition of new training tasks. Results demonstrated that children required an average of 25 trials to master tasks matched to their highest-passed ABLA-R level, and 42 trials to master tasks mismatched to their ABLA-R level. More specifically, children required an average of 47 trials to master tasks mismatched below their ABLA-R level, and 34 trials to master tasks mismatched above their ABLA-R level; perhaps this particular difference was due to boredom or lack of motivation with the larger proportions of tasks that are considered too easy (note that an average of 64% of mismatched tasks were mismatched below the children's highest-passed ABLA-R levels). Despite the lack of a statistically significant difference in rates of acquisition between matched and mismatched tasks, these results contribute beneficial information to the EIBI literature, and more specifically, to staff working with children enrolled in large EIBI programs.

The results of Parts I and II of this study expand the current research on children with ASD, the ABLA-R and the ABLLS-R, with the objective of improving individualized training procedures and curricula currently used in EIBI programs for children with ASD. Given the increasing prevalence of ASD, the limited amount of fund-

ing, and the growing waitlists for families with children with ASD, these studies contribute valuable information that may benefit both service providers and families receiving services.

Key Messages From This Article

People with disabilities. It is important that you receive services and treatments that match your specific needs and abilities, to promote your opportunities to quickly learn and be successful, with less frustration.

Professionals. You have a critical role in helping people with disabilities. It is necessary for you to ensure that a person's training tasks correspond to their learning ability. One way to do this is by measuring what a person is already able to do, and then using this information to find training tasks and activities that are a good match for that person.

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