

## Does Early Intensive Behavioural Intervention Improve the Social Skills of Children with Autism? An Exploratory Study

*Est-ce que l'intervention comportementale intensive favorise les habiletés sociales des enfants ayant un trouble du spectre de l'autisme ? Une étude exploratoire*

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### Abstract

*The development of appropriate social skills is critical for all children in establishing relationships and being able to successfully participate in their communities. Children with Autism Spectrum Disorder (ASD), however, have pronounced difficulties with social skill acquisition, development, execution, generalization and maintenance, which are characteristic of the disorder.*

*For children with ASD, the development of fundamental social skills (e.g., saying thank you, smiling when seeing their caregiver) to more complex social skills (e.g., expressing empathy and cooperation) represent unique challenges. Yet, little research has focused on complex social skills as an outcome of Early Intensive Behavioural Intervention (EIBI), a well-established intervention for children with ASD.*

*The present study evaluated fundamental and complex social skills in a sample of 16 children with ASD from two community settings in Québec before and two years after participating in EIBI. Pre-intervention and post-intervention measures included the Social Skills Improvement System (SSIS) to screen for complex social skills and problem behaviours, and the Adaptive Behavior Assessment System (ABAS-II) to screen for fundamental social skills.*

*Significant pre- to post-test improvements in social skills were found with the ABAS-II but not with the*

*SSIS. Although preliminary, these findings are suggestive that within EIBI programs, specific social skills should be targeted directly.*

## Résumé

Le développement d'habiletés sociales appropriées est crucial pour que les enfants puissent établir des relations et puissent être capables de participer adéquatement dans leurs communautés. Toutefois, les enfants ayant un trouble du spectre de l'autisme (TSA), ont des difficultés marquées avec l'acquisition, le développement, l'exécution, la généralisation et le maintien d'habiletés sociales, ce qui caractérise le trouble.

Pour les enfants ayant un TSA, le développement d'habiletés sociales de base (p. ex., dire merci, sourire lorsqu'on voit le donneur de soin) jusqu'aux habiletés sociales plus complexes (p. ex., exprimer de l'empathie et la coopération) comporte des défis uniques. Jusqu'à présent, peu de recherches se sont concentrées sur les habiletés sociales complexes en tant que retombés de l'intervention comportementale intensive (ICI), une intervention reconnue pour les enfants ayant un TSA.

La présente étude a évalué les habiletés sociales de base et complexes chez un échantillon de 16 enfants ayant un TSA avant et après leur participation à deux ans d'ICI dispensée au sein de deux milieux communautaires au Québec. Les mesures pré-intervention et post-intervention incluaient le *Social Skills Improvement System* (SSIS) pour évaluer les habiletés sociales complexes et les comportements problématiques, ainsi que le *Adaptive Behavior Assessment System* (ABAS-II) pour évaluer les habiletés sociales de base.

Des améliorations significatives entre le prétest et le post-test ont été soulevées auprès des comportements sociaux mesurés au moyen de l'*ABAS-II*, mais non du *SSIS*. Bien que préliminaires, ces constats suggèrent que des comportements sociaux spécifiques devraient être ciblés directement au sein des programmes d'ICI.

*Mots-clés* : autisme, habiletés sociales, intervention comportementale intensive, communautés

## Introduction

Social skills deficits are a core symptom of autism spectrum disorder (ASD; American Psychological Association, 2013), and are critically important as they help children establish successful relationships and promote their social inclusion (Laugeson et al., 2015; Whalon et al., 2015). Difficulties in acquiring skills arise when a child does not have enough opportunities to practice or is engaging in competing problem behaviour, such as repetitive or aggressive behaviour (Elliot, 2016; Gresham et al., 2010). Social skills develop incrementally and range from fundamental skills such as joint attention and eye-contact to more complex ones such as empathizing and cooperation (Rankin et al., 2016). Despite this distinction, very few studies have examined a comprehensive range of social skills while evaluating the effectiveness of Early Intensive Behavioural Intervention (EIBI; e.g., Kovshoff et al., 2011).

In terms of improving ASD deficits in social communication and social interaction, EIBI has enjoyed significant empirical support (Dawson & Burner, 2011; Reichow, 2012; Rivard et al.,

2019). However, EIBI does not appear to improve outcomes equally with some of the smallest gains noted in the socialization domain (Reichow, 2012). In addition to fundamental social skills (e.g., smiling when seeing a caregiver or saying thank-you when given a gift), examining EIBI's impact on more complex social skills (e.g., standing up for others who are treated unfairly or showing concern and respect for other's viewpoint) is critical as more nuanced and advanced skills are needed to successfully navigate one's social milieu. Indeed, the domains of social functioning rated as most important by young individuals with ASD include the more complex skills of empathy and cooperation (Rankin et al., 2016). Additionally, little is known about the specific components that contribute to the effectiveness of EIBI (Rivard et al., 2019; Zachor & Ben-Itzhak, 2017). Based on this perceived gap, several researchers have called for additional research on EIBI outcomes in terms of core ASD deficits, including social communication and social interaction (Rivard et al., 2019).

The present study is part of a larger study conducted at two different sites in Québec, Canada. One site was government funded and the other was a not-for profit agency. The title of the larger study is *Early Intervention Services for Autism Spectrum Disorders in Québec: Evaluation of their Impacts on Children and their Families*. For the present study, we asked if an EIBI program conducted at the two different sites had significant effects on fundamental and/or complex social skills in young children.

## Materials and Methods

### Ethical Approval

IRB approval was obtained from McGill's IRB (REB-III) and the Comité d'Éthique de la Recherche Conjoint des CRDITED (CÉRC/CRDITED).

### Recruitment

Twenty-eight young children and their caregivers were recruited from two sites providing EIBI services (one public government-funded and one not-for-profit) in Québec, Canada. Participants were recruited by program supervisors or directors at each site during their intake into the program. When a new child was admitted, a staff member presented the study to the families and read the consent form with them. Each participant met the following inclusion criteria: (a) the child had a diagnosis of ASD provided by a licensed psychologist; (b) the child was less than five years old at intake; and (c) the child was receiving early intervention services at one of the two sites indicated above. Participants who agreed to participate were then contacted by the research team to schedule a pre-intervention evaluation. Participant recruitment and evaluation of the children pre-intervention and post-intervention was conducted by independent trained research assistants at the site where the child was receiving services.

### Participants

Of the 28 children whose families were recruited for participation, a total of 16 (10 from the government funded site, and six from the not-for-profit site) took part in the study. Four

participants who indicated their interest during their intake appointment changed their minds before pre-intervention or could not be reached by the research team and were consequently considered dropouts. An additional eight participants were lost to follow-up.

### **EIBI Intervention**

Both sites offered therapy based on ABA principles to prepare children for preschool or kindergarten. Both programs developed an individualized plan for the child based on ABA principles with the goal of promoting the child's functional, social, and communication skills as well as preparing him/her to transition into preschool. Both programs were conducted by interdisciplinary teams including a psychologist, a speech language pathologist, and an occupational therapist, and worked in collaboration with parents and the child's school or daycare. At the government-funded site, the program was implemented in the child's home or daycare. The intervention provided by the not-for-profit site took place at the centre. The EIBI program and the evaluations were conducted in the child's and the family's language of preference (either English or French).

### **Measures for the Full Study**

For the larger study, socio-demographic information was gathered using a questionnaire developed by the research team; the children's cognitive functioning, adaptive functioning, severity of ASD symptoms, adaptive functioning, fundamental and complex social skills, and problem behaviours were assessed pre-intervention and post-intervention of the EIBI program.

One of the parents, usually a mother, completed the questionnaires. Research assistants assessed children's cognitive functioning (IQ) using The Wechsler Preschool and Primary Scale of Intelligence, Third Edition (WPPSI-III; Wechsler, 2002). Children's autism symptoms were assessed using the Children's Autism Rating Scales (CARS; Schopler et al., 2002). Lastly, the General Adaptive Composite (GAC) from the Adaptive Behavior Assessment System (ABAS-II) was used to assess the children's adaptive functioning (Harrison & Oakland, 2003,  $\alpha \geq .78$ ).

The Social Scale from the ABAS-II was used as a measure of the children's social skills. The ABAS-II defines social skills as the "skills needed to interact socially and get along with other people including having friends, showing and recognizing emotions, assisting others, and using manners." Examples include but are not limited to: "Saying thank-you when given a gift," "showing sympathy for others when they are sad or upset," "offering to lend belongings to others," and "complementing others for good deeds or behaviour." As the ABAS-II is a measure of adaptive skills, it focuses on the social skills needed for "daily living without the assistance of others." We selected the ABAS-II in the present study over the more commonly used Vineland due to its shorter administration time and its previous use in Québec (e.g., Rivard et al., 2014).

To evaluate a broader range of social skills as well as problem behaviours that may interfere with social skills use, the Social Skills scale and the Problem Behaviour scale of the Social Skills Improvement System were used (SSIS; Gresham & Elliott, 2008,  $\alpha \geq .70$ ). Social skills are defined by the Social Skills Improvement System (SSIS) as "skills that promote positive interactions and discourage negative interactions." In addition to communication, cooperation, and engagement (included in the ABAS-II), the SSIS also includes the following skills, which may be considered more complex social skills: Responsibility (i.e., showing regard for property and work), empathy (i.e., showing concern and respect for other's viewpoint), assertion (i.e.,

initiating behaviour such as asking for information), self-control (i.e., responding appropriately to conflict (disagreeing, teasing) and non-conflict (taking turns and compromising). Examples of social skills measured by the SSIS include: “Stays calm when disagreeing with others,” “makes a compromise during a conflict,” “takes criticism without getting upset,” “takes responsibility for her/his own mistakes,” “stands up for himself/herself when treated unfairly,” “stands up for others who are treated unfairly,” and “starts conversations with peers.”

An ABAS-II, SSIS, or WPPSI-III score falling between 85 and 115 (i.e., within one standard deviation of the mean) represents the average range of functioning. A score falling above 130 or 70 (i.e., more than two standard deviations from the mean) is considered unusually high or unusually low. CARS scores range from 15 to 60, with scores between 30 and 37 indicating mild to moderate autism and scores between 38 and 60 indicating severe autism.

### Procedures and Analysis for the Present Study

Of the 16 participants from the two community sites who participated in the present study (see the section called *Participants*, above), all had completed the ABAS-II questionnaire at pre- and post- intervention, and 15 had completed the SSIS at both times. Because of the small sample size, results from the two sites were pooled. We conducted two sided paired-sample *t*-tests to address our main research question: Do children’s social skills (both fundamental and more complex) as measured by the SSIS and ABAS-II improve after receiving EIBI services? For interest, pre- and post-test problem behaviours also were compared. Significance was interpreted at the 95% confidence level.

**Table 1**

*Child Demographic Information at Pre-Intervention*

	Government-Funded Site		Not-for-Profit Site	
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>
Number of Participants	10		6	
Participant Sex Ratio (M:F)	7:3		5:1	
Hours of EIBI Per Week	17.5	4.7	15.0	7.1
Age of child (years)	4.5	.6	3.9	.6
Cognitive Functioning (IQ)	63.2	20.6	72.8	19.2
Adaptive Functioning	55.5	8.4	63.7	7.3
ASD Severity	35.5	8.0	32.0	3.2

*Note.* A cognitive functioning (IQ) score ranging from approximately 80-120 is considered average, indicating that a child is functioning similarly to their typically developing peers.

## Results

Demographic information is presented in Table 1. Results from the pre- and post-intervention tests are presented in Table 2.

**Table 2**

*Difference in Children's Complex skills, Social Skills, and Problem Behaviours from Pre-test to Post-test*

	Pre-Intervention			Post-Intervention			<i>T</i> Statistic
	N	M	SD	N	M	SD	
Complex Social Skills (SSIS)	15	68.8	15.1	15	66.0	19.7	.68
Problem Behaviour (SSIS)	15	111.9	13.3	15	117.7	17.8	-2.0
Social Skills (ABAS-II)	16	63.4	12.0	16	75.3	14.0	-2.5*

Note. \*  $p = .022$

Participants' social skills (ABAS-II) improved significantly from pre-intervention ( $M = 63.4$ ,  $SD = 12.1$ ) to post-intervention ( $M = 75.3$ ,  $SD = 14.0$ ),  $t(15) = -2.54$ ,  $p = .02$ ,  $d = .64$ ). This is a small yet statistically significant improvement in social skills. It is not known if this improvement is clinically significant. Participants' more complex social skills as measured by the SSIS did not significantly improve from pre-intervention ( $M = 68.8$ ,  $SD = 15.1$ ) to post-intervention ( $M = 66.0$ ,  $SD = 19.7$ ),  $t(14) = -.68$ ,  $p = .51$ ,  $d = .17$ ). However, it is worth mentioning that the children's social skills (SSIS) had standard deviations between 15.1 and 19.7 standard score points as measured on the scale itself. This is considered a large variation in standard deviation and refers to a statistical measure that might differ from the clinical one. Therefore, it is possible that clinically significant change occurred within that range of variability for some children but was not detected in the overall sample due to this large amount of variability. Participants' problem behaviour scores did not change significantly from pre-intervention ( $M = 111.9$ ,  $SD = 13.3$ ) to post-test ( $M = 117.7$ ,  $SD = 17.8$ ),  $t(14) = -2.02$ ,  $p = .06$ ,  $d = -.52$ ).

## Discussion

This study addressed a perceived gap in the scientific literature by examining the effectiveness of EIBI in a publicly funded and in a not-for-profit setting with a diversified community sample in a Québec Francophone community. In line with Rivard and colleague's (2014) findings, children with ASD's fundamental social skills improved significantly after receiving EIBI. However, children's more complex social skills (e.g., cooperation, empathy) did not, nor did their problem behaviours decrease. Findings suggest that EIBI may not target all types of social skills equally,

with children making greater gains in fundamental social skills than in more complex social skills, or in their problem behaviours.

Overall, the significant gains in social skills made by the children prior to and after EIBI suggest that positive and meaningful changes can occur for children with ASD. To date, EIBI remains one of the interventions available for children with ASD with a considerable body of evidence underscoring its effectiveness (Dawson & Burner, 2011; Reichow, 2012; Rivard et al., 2019; Smith et al., 2019). The present study adds to that body of evidence. It is recommended that policymakers continue to invest in EIBI services as opposed to funding interventions with equivocal findings or no evidence at all to substantiate their use (e.g., Lilienfeld et al., 2014; Ziviani et al., 2010). This study also adds to the body of literature by distinguishing between children with ASD's fundamental and more complex social skills. This less examined distinction is an important one as social skills could benefit to varying degrees from EIBI services. The results of future studies could therefore help inform clinical programming by ensuring that a comprehensive range of skills are targeted, including the social skills that are important to children and their families. Lastly, the population examined is also of interest. EIBI's effectiveness was evaluated in a Québec Francophone community, a population that remains under-researched in terms of EIBI's effectiveness.

Within EIBI programs, targeting specific social skills and problem behaviours directly is recommended. Indeed, appropriate social skills and minimal problem behaviour are the foundation for children's full and independent functioning as well as facilitating or hindering their participation in the community as they grow older (Laugeson et al., 2015). The present findings suggest that the distinction between fundamental social skills and more complex skills is an important one. More complex social skills may take longer to develop or change compared to more basic social skills. In addition, as Rankin and colleagues (2016) have clearly documented, it is also critical to ascertain which social skills and problem behaviours are deemed important by parents and individuals with ASD in addition to those identified by service providers. Notably, Rankin and colleagues (2016) identified empathy and cooperation as domains of social functioning rated as most important by young individuals ( $M$  age = 13.4 years) with ASD. By contrast, the children's parents placed more importance on the children's ability to assert themselves and exert self-control (Rankin et al., 2016).

In terms of limitations, we used a quasi-experimental design with no control group, as the complexity of the multitude of variables in early intervention systems are difficult to manipulate due to ethical considerations (Eikeseth et al., 2012). Moreover, the sample size was small. As a result, we were not able to make causal statements as the improvements identified may have been due to maturation or historical variables. However, it is unlikely that the gains made by the children were due to maturation effects alone, as the EIBI intervention effectiveness evaluated in the present study has previously been validated by numerous researchers who were able to implement stronger experimental controls such as randomized control trials, quasi-randomized control trials, or clinical control trials using a comparison group receiving treatment-as-usual (Cohen et al., 2006; Eikeseth et al., 2012; Estes et al., 2015; Howard et al., 2005; Magiati et al., 2007; Remington et al., 2007; Smith et al., 2000). Another limitation resulting from conducting research in a public-based setting is the difficulty in recruiting and retaining participants. A larger sample size would allow for an examination of possible interaction effects between our variables.

## Key Messages from this Article

**People with Disabilities.** You have the right to evidence based EIBI services targeting social skills that are important to you.

**Professionals.** Within EIBI programs, it is important to target specific and distinct social skills and decrease problem behaviours as they lay the foundation for children's full and independent functioning and participation in the community as they grow older (Laugeson et al., 2015).

**Policymakers.** More research into the determinants of EIBI effectiveness needs to be conducted in a Francophone community sample with a diverse participant pool.

## Messages clés de cet article

**Personne ayant une incapacité.** Vous avez le droit d'avoir des services ICI basés sur les données probantes qui ciblent les habiletés sociales qui sont importantes pour vous.

**Professionnels.** Au sein des programmes d'ICI, il est important de cibler des habiletés sociales spécifiques et distinctes, ainsi que de diminuer les comportements problématiques, car ils représentent les fondements du fonctionnement et de la participation optimale et indépendante des enfants dans leur communauté à mesure qu'ils vieillissent.

**Décideurs.** Plus de recherches auprès des déterminants de l'efficacité de l'ICI doivent être menés auprès d'échantillons de communautés francophones, avec un bassin de participants diversifié.



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