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Comparing Service Delivery Models for Children with Developmental Delays in Canada: Adaptive and Maladaptive Behaviours, Parental Perceptions of Stress and of Care

Ingrid E. Sladeczek
McGill University, ingrid.sladeczek@mcgill.ca

Laura Fontil
McGill University, laura.fontil@mail.mcgill.ca

Nancy Miodrag
California State University, Northridge, nancy.miodrag@csun.edu

Anastasia Karagiannakis
Learning Associates of Montreal, anastasia.karagiannakis@mail.mcgill.ca

Daniel Amar
Centre intégré universitaire de santé et de services sociaux, daniel.amar.comtl@ssss.gouv.qc.ca

See next page for additional authors

Abstract

This study compares two service delivery models (community-based and centre-based), examining them in light of children's adaptive and maladaptive behaviours, and parental perceptions of stress and of care. More specifically, parents of 96 children with developmental delays assessed their children's adaptive and maladaptive behaviours and rated their own perceived levels of stress as well as their perceptions of care from service providers. Findings indicated that children from the community-based sites were perceived as having less severe social skill deficits than those from centre-based sites. Regarding parental stress, mothers from community-based settings reported more challenges with their child's father than did the mothers from centre-based settings; and fathers from the community-based settings reported more challenges related to their health than did the fathers from the centre-based settings.

Regarding care, parents from the centre-based settings had more positive perceptions of care than did parents from the community-based settings. Therefore, in general, parents receiving services within community-based settings reported fewer positive perceptions of care and more challenges than those from centre-based settings. Overall, the results of this investigation can inform future programming for community- and centre-based service delivery systems. More specifically, the findings highlight the important role that family-centred care can play in supporting the needs of children with developmental delays and their families; particularly for families using community-based services.

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Authors

Ingrid E. Sladeczek, Laura Fontil, Nancy Miodrag, Anastasia Karagiannakis, Daniel Amar, and Janet Amos

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Janet Amos
McGill University

Abstract

This study compares two service delivery models (community-based and centre-based), examining them in light of children's adaptive and maladaptive behaviours, and parental perceptions of stress and of care. More specifically, parents of 96 children with developmental delays assessed their children's adaptive and maladaptive behaviours and rated their own perceived levels of stress as well as their perceptions of care from service providers. Findings indicated that children from the community-based sites were perceived as having less severe social skill deficits than those from centre-based sites. Regarding parental stress, mothers from community-based settings reported more challenges with their child's father than did the mothers from centre-based settings; and fathers from the community-based settings reported more challenges related to their health than did the fathers from the centre-based settings. Regarding care, parents from the centre-based settings had more positive perceptions of care than did parents from the community-based settings. Therefore, in general, parents receiving services within community-based *settings reported fewer positive perceptions of care and more challenges than those from centre-based settings. Overall, the results of this investigation can inform future programming for community- and centre-based service delivery systems. More specifically, the findings highlight the important role that family-centred care can play in supporting the needs of children with developmental delays and their families; particularly for families using community-based services.*

Many children with developmental delays under the age of 9 and their families are in dire need of supports and services, but may not be receiving them due to underfunding of programs, long wait lists, and lack of services available for milder cases (Shepherd & Waddell, 2015). Children with developmental delays can have specific congenital or acquired conditions or be at risk of developing these conditions later in life. Developmental delays may affect self-care, receptive and expressive language, learning, mobility, self-direction, capacity for independent living, or economic self-sufficiency (Developmental Disability Assistance and Bill of Rights Act, 2000). Early intervention (EI) programs are specifically designed to enhance these children's cognitive (Blackman, 2002; Eldevik, Jahr, Eikeseth, Hastings, & Hughes, 2010; Klintwall & Eikeseth, 2014; Reichow, 2012; Warren et al., 2011), emotional (Blackman, 2002; Klintwall & Eikeseth, 2014), social (Klintwall & Eikeseth, 2014), physical (Blackman, 2002; Klintwall & Eikeseth, 2014), and adaptive functioning (Blackman, 2002; Eldevik et al., 2010; Hwang, Chao, & Liu, 2013; Reichow, 2012; Shackelford, 2006; Warren et al., 2011). The early years are a time of critical importance for making developmental gains (Blackman, 2002; McCain, Mustard, & Shanker, 2007; McCollum, 2002) and is underscored by Guralnick (2005a, p. 314), who states that "expectations are quite high that much can be accomplished during the first 5 years of life through the thoughtful implementation of systematic, comprehensive, experientially based early intervention programmes."

EI can enhance future Canadian children's employability and income in adulthood, generating $8.2 billion in Canada's tax revenues and reducing expenditures by $4.9 billion (Trefler, 2009). In the United States, cost–benefit analyses reveal that early childhood intervention programs can yield a benefit of between $1,400 to $240,000 per child served (Karoly, Kilburn, & Cannon, 2005). Thus, each dollar invested in EI initiatives results in a $1.80 to $17.07 return to society. Clearly, examining EI models that offer insight into the development of more effective intervention practices merit our attention.

Despite the positive ramifications of the Canadian Charter of Rights and Freedoms and the Canadian Human Rights Act, and of the Developmental Disability Assistance and Bill of Rights Act (2000) in the United States, EI delivery systems are often ineffective, inappropriate, or inaccessible (American Academy of Pediatrics, 2009; Harris, Lieberman, & Marans, 2007; Shepherd & Waddell, 2015). There is little or no empirical basis for stated program efficacy (e.g., Boyd, Odom, Humphreys, & Sam, 2010; Jacobson, Foxx, & Mulick, 2005; Ziviani, Feeney, Rodger, & Watter, 2010). Analyzing EI models is a complex process; however, it is of paramount importance that more effort be expended in doing so. Ultimately, the goal should be to identify (with more specificity than currently exists), what type of EI service delivery models best serve children with developmental delays or disabilities, given their unique characteristics and needs, the needs of the family (both immediate and extended), and those of the community.

Types of Service Delivery Models

A vast array of support exists today for children and families in need of EI services (Guralnick, 2000; McCollum, 2002; Underwood, 2012). A preponderance of services tend to be cross-categorical rather than disability-specific, and aim to prevent, improve, or remediate limitations related to a delay or a disability (McCollum, 2002; Poling & Edwards, 2014). EI programs include services such as: assistive technology, audiology, medicine and nursing, nutrition, occupational therapy, physiotherapy, and psychology and psychiatry. Other services may include special instruction (e.g., modified curriculum and instructional practices), speech-language pathology, social work/family services, transition services, and vision services (Individuals with Disabilities Education Act, 2004). These services can be offered in schools, homes, or community-based centres (Blackman, 2002; Farrell, Trigonaki, & Webster, 2005).

To address family needs, practitioners have (for the most part) shifted from professional- and child-centred models of care to family-centred care (Brehaut et al., 2004). Family-centred care is considered best practice (King, Teplicky, King, & Rosenbaum, 2004; Pighini, Goelman, Buchanan, Schonert-Reichl, & Brynelsen, 2014). Family-centred services are a form of service delivery that respects and supports parents as the experts and primary decision makers in their children's lives (Coogle & Hanline, 2014; King, King, & Rosenbaum, 2004). Core components of family-centred care include collaboration between parents and service providers, acknowledgement of parents as experts about their child's strengths and needs, and increased decision-making roles for families (Law et al., 2005). Service providers that position parents as the primary force in their child's life have been shown to promote better psychological health of parents and greater satisfaction with services (King, King, et al., 2004; King, Teplicky, et al., 2004). More specifically, family-centred practice has been found to help increase family satisfaction, perception of service provider helpfulness, and a stronger sense of control and self-efficacy (Coogle & Hanline, 2014; Dunst, Trivette, & Hamby, 2007; Kingsley & Mailloux, 2013; Tonge, Bull, Brereton, & Wilson, 2014). Parents of children at risk for a developmental delay report that they value the collaborative nature of family-centred service provision because it empowers them (Pighini et al., 2014).

EI services are included in diverse delivery systems including center-based and community-based models. Depending on the location and type of facility from which EI services are provided or emanate, centre-based and community-based service provision may be operationalized differently. In this investigation of EI service delivery models, the centre-based and community-based models have been found to share some essential features, but were also differentiated by important characteristics (see Figure 1).

Figure 1.

Similarities and Differences Between Community-Based and Centre-Based Service Delivery Models.

Criteria	Centre-Based	Community-Based
"Shop under one roof"	✔	
Family-centred	✔	
Often privately funded	✔	
Limited space	✔	
High number of service hours per week	✔	
Service hub		✔
Services provided in community settings		✔
Often government funded		✔
Service large numbers		✔
Low number of service hours per week		✔
Coordination of disparate service		✔
Multiple EI services	✔	✔
Supporting families	✔	✔
Partially government funded	✔	✔

In the present study, centre-based and community-based models both offer multiple EI services (e.g., speech-language pathology, occupational therapy) to support the needs of children and their families. Community-based models are often entirely government funded, but both models are often partially funded by the federal and/or provincial government. The primary difference between the two models is that the centre-based model can be described as a "shop under one roof" where most, if not all, families' needs are met under one roof, whereas the community-based model operates from a "hub," with some services provided on-site and others offered by outside providers. The nature of centre-based models (i.e., "shop under one roof," limited number of service users, high number of service hours per week) made it easier for the sites we studied to establish family-based practices for meeting the varying needs of families; and families tended to establish frequent and open lines of communication with centre-based service providers. At the community-based sites, in contrast (i.e., service "hub," high number of service users, low number of service hours per week), providers coordinate services for families to assist them in meeting their varying needs, making it potentially more challenging to be family-centred. Furthermore, centre-based service providers were primarily privately funded, whereas community-based providers were generally funded by the provincial government. All EI service providers (centre- and community-based) provided services to children with a variety of developmental delays.

Children's Behaviour as it Relates to Parent Effects

Children with various developmental delays may exhibit maladaptive behaviours including hyperactivity, aggression, anxiety, depression, somatization, atypicality, withdrawal, and attention problems that can impede learning and functioning (Baker, Blacher, Crnic, & Edelbrock, 2002; Eisenhower, Baker, & Blacher, 2009; Emerson & Einfeld, 2010; Feldman, Hancock, Rielly, Minnes, & Cairns, 2000). Emerson and Einfeld (2010) found that 2- to 3-year-olds with developmental delays showed significantly higher levels of maladaptive behaviours (e.g., emotion regulation, conduct problems) compared to young children who were typically developing. Baker et al. (2002) reported that children with developmental delays were three to four times more likely to have clinically significant dysfunctional or maladaptive behaviours than children without developmental delays. Challenging behaviours in children with developmental delays may hinder opportunities for families to socialize because these behaviours can be misunderstood or misinterpreted (Falk, Norris, & Quinn, 2014). Parents may feel ostracized or stigmatized and stressed. Quite simply, these behaviours can have a profound effect on parents (Dabrowska & Pisula, 2010; McCarthy, Cuskelly, van Kraayenoord, & Cohen, 2006; Raina et al., 2005). Maladaptive behaviour in children with developmental delays has been reported as the single greatest determinant of parental stress (Baker et al., 2002; Estes et al., 2009; Hodapp, 2002; Johnston et al., 2003; McCarthy et al., 2006; Plant & Sanders, 2007; Raina et al., 2004; Raina et al., 2005).

The current study compares families of children with developmental delays being served in either centre-based or community-based service models, examining three variables of interest: (a) adaptive and maladaptive behaviours, (b) perceptions of parental stress, and (c) perceptions of service provider care.

Method

Participants

The sample included 96 families of children with developmental delays (61 males and 35 females) recruited from four Canadian provinces: Québec, Ontario, Alberta, and British Columbia. Children ranged from 2 years, 0 months to 9 years, 9 months. Among those studied, 36 children were diagnosed with an autism spectrum disorder (ASD), 44 with a genetic syndrome, and 13 with a global developmental delay. Of the participants, 45 families received centre-based services and 51 families received community-based services. See Table 1 for participant demographic information.

Five EI sites are described below: Sites 1 and 2 are considered center-based, and sites 3 through 5 are considered community-based. Each site employed a range of professionals who worked together in a collaborative manner. In *multidisciplinary teams,* professionals work in parallel (Warner, 2001); *interdisciplinary teams* generally conduct evaluations independently, but often collaborate during intervention planning (Stepans, Thompson, & Buchanan, 2002); and in *trans-disciplinary teams* professionals and families work together at the onset of practice to develop an integrated and comprehensive intervention plan for children and families (Bell, Corfield, Davies, & Richardson, 2010).

Table 1

Participant Demographic Information

Variable	Centre-Based	Community-Based	Total
Child Age (Months)			
M	58.40	64.57	61.21
(SD)	(22.88)	(23.61)	(23.67)
Sex			
Boys	30	31	61
Girls	15	20	35
Diagnosis			
Autism spectrum disorder	20	16	36
Genetic syndrome	17	27	44
Global developmental delay	5	8	13

Centre-based sites. Site 1, located in Québec, serves approximately 75 children from the ages of birth to 9 years old with varying developmental delays or disabilities (e.g., ASD, global developmental delay, Down syndrome or other genetic disorders). The agency provides individualized interventions for children to improve the quality of life of children and their families. A primary goal is to facilitate successful transitions for the children from early childhood programs to inclusive school-age settings. The multidisciplinary team consists of 11 types of professionals (e.g., psychologists, educators, social workers) who provide 14 services to their clients (e.g., art therapy, occupational therapy, pediatric physiotherapy), for an average of 15 hours per week. There is no wait list for services, and on average, children receive services for two years. Their funding is 80% from private sources, 15% from non-profit sources, and 5% is provided by the provincial government. Services cost an average of $2,000 per month.

Site 2, located in Ontario, is a school and intervention centre for children with physical and developmental disabilities (e.g., ASD, cerebral palsy, Down syndrome, Prader-Willi sydrome, Rett syndrome). Staff provide individualized and integrated evidence-based interventions at their main centre and satellite schools. The centre serves approximately 70 children from birth to 10 years of age and older. The trans-disciplinary team consists of 17 types of professionals (e.g., developmental psychologists, occupational therapists, music therapists) who provide 14 services (e.g., occupational therapy, psychological services). When clients are put on wait lists, they are provided with assessment and wait list services. This centre is funded both privately and by the provincial government.

Community-based sites. Site 3, located in Ontario, serves approximately 3,000 children from birth until school entry who have physical, developmental, or behavioural challenges. Staff offer a range of services to several sites including welcoming services, assessment, diagnosis, therapy, a blind-low vision intervention, and a specialized preschool setting. The interdisciplinary team includes 13 types of professionals (e.g., behaviour consultants, nurses, social workers), providing 26 services (e.g., recreation therapy, physiotherapy, occupational therapy) for an average of two hours per week. Current data show an average wait list of 5.5 months for services and 13 months for an initial assessment. The site offers wait list assessments and services and receives 100% of its funding from the provincial government.

Site 4, located in Alberta, is a non-profit, inclusive, early education program serving approximately 72 children with disabilities ages birth to 5 years. Programs are offered in the home or community, and intervention plans are individualized. The multidisciplinary team includes 8 types of professionals (e.g., psychologists, social workers) and provides 14 types of services (e.g., support groups, family workshops). The majority of its funds come from the provincial government (approximately 95%); remaining funds come from non-profit organizations.

Site 5, located in Québec, is a rehabilitation centre for individuals with intellectual disability, ASD, or pervasive developmental disorders and serves more than 800 children and approximately 1,000 adults. The goal is to provide individuals with special needs with a wide range of services in community-based settings. Site 5 supports the full inclusion of their clients in community settings. The team consists of 7 types of professionals (e.g., psychologists, social workers) who offer 7 specialized services (e.g., psychological services, occupational therapy).

The total number of participants attending sites 1–5 was 64.The remaining participants (aged 2 years, 0 months, to 9 years, 9 months) attended centre-based settings (*n*= 2) or community-based settings (*n* = 30) across Québec, Alberta, Ontario, and British Columbia. We have not described these settings in detail, since just one study participant from each of these sites participated in the study.

Measures

Children's adaptive and maladaptive behaviours. The *Behaviour Assessment System for Children—Externalizing/Internalizing, Second Edition* (BASC-2; Reynolds & Kamphaus, 2004), which comprises a Parent Rating Scale, Behavioural Symptoms Index, and Adaptive Skills Index, was used to measure children's adaptive and maladaptive behaviours. Behaviours assessed include hyperactivity, aggression, anxiety, depression, somatization, atypicality, attention problems, withdrawal, conduct problems, adaptability, social skills, participation in activities of daily living, functional communication, and leadership. For each of the 160 items on the BASC-2, parents were asked whether a behaviour *never*, *sometimes*, *often*, or *almost always* occurred with their child.

The BASC-2 system has been normed on U.S. Census population characteristics, and T-scores and percentiles are available for the general population and clinical populations. The scores of each scale can be interpreted in T-scores in the following manner: the clinical scales (i.e., hyperactivity, aggression, anxiety, depression, somatization, atypicality, attention problems, withdrawal, and conduct problems) can be categorized via five levels—(a) scores of 70 and above are considered clinically significant; (b) scores of 60–69 are seen as placing the child at risk; (c) scores of 41–59 are within the average range of functioning; (d) scores of 31–40 are considered low; and (e) scores of 30 and below are considered very low.

The adaptive scales (i.e., adaptability, social skills, activities of daily living, functional communication, and leadership) are interpreted conversely; that is, low scores are seen as maladaptive, while high scores are regarded as adaptive. Scores of 70 and above suggest very high adaptive functioning; scores of 60–69 are viewed as indicators of high adaptive functioning; scores of 41–59 are considered to be within the average range; for scores of 31–40 the child is considered at risk; and, finally, scores of 30 and below suggest clinically significant adaptive difficulties. Internal consistencies for the Parent Rating Scale of BASC-2 are high for the general norm samples. The Behavioural Symptoms Index and Adaptive Skills Index scores fall in the low- to mid-90s and the Internalizing and Externalizing Problems Indices are in the mid-80s to mid-90s (Reynolds & Kamphaus, 2004). Test–retest reliabilities for the composite scales are high, ranging from low 80s to low 90s, with the exception of Internalizing Problems, which was .78. For inter-rater reliability, the Parent Rating Scale shows median inter-rater reliabilities to be .74 (preschool), and .69 (child).

The Vineland Adaptive Behaviour Scales-II, Survey Interview Form (VABS-II; Sparrow, Cicchetti, & Balla, 2005) is a semi-structured parent interview and was used to measure children's adaptive behaviours. It is comprised of four domain composites: Communication (receptive, expressive, written), Daily Living Skills (personal, domestic, community), Socialization (interpersonal relationships, play and leisure time, coping skills), and Motor Skills (gross, fine). Behaviours are rated 3, 2, or 1 point to indicate whether the child performs the behaviour independently—*usually* (score of 2), *sometimes* (score of 1), or *never* (score of 0). Combined, these composites make up an Adaptive Behaviour Composite score, with higher scores indicating better adaptive functioning.

The VABS demonstrates fair to good inter-interviewer reliability for communication (.81), including receptive (.79) and expressive language (.66); and socialization (.73) including interpersonal relationships (.63), play and leisure time (.51), and coping (.68). Internal consistency using the split-half reliability coefficients is excellent for ages 0–5 years and 6–11 years, respectively: communication (.92 and .93), receptive (.80 and .76), expressive (.93 and .88); socialization (.93 and .93), interpersonal (.87 and .85), play and leisure time (.83 and .77), and coping (.87 and .88).

Parental perceptions of stress. The *Parenting Stress Index* (PSI; Abidin, 1990) is a 101-item self-report tool that was used in this study to determine potentially dysfunctional parent–child interactions. The instrument yields the following domains: Child Domain, Parent Domain, Total Stress Domain, and Life Stress Index Scale. The Child Domain consists of Distractibility/Hyperactivity, Adaptability, Reinforces Parent, Demandingness, Mood, and Acceptability sub-scales. The Parent Domain consist of Competence, Social Isolation, Attachment to Child, Health, Role Restriction, Depression, and Spouse sub-scales. Alpha reliabilities for the domains are high (.89 = Child Domain, .93 = Parent Domain, .95 = Total Stress Domain). The reliabilities of sub-scales for the Child Domain ranged from .62 to .72 and from .55 to .80 for the Parent Domain. Test–retest reliability is .55 for the Child Domain, .70 for the Parent Domain, and .96 for the Total Stress Domain.

Parents' perceptions of service providers. The *Measure of Processes of Care* (MPOC-20; King, King, et al., 2004) was used to measure parental perceptions of the extent to which specific behaviours of health care professionals occur within a 12-month period. The MPOC-20 is a 20-item self-report questionnaire used to examine the degree of association between how care is delivered and the psychosocial well-being of parents who have children with chronic illness and disabilities (King, King, et al., 2004). The measure has five-factor analytical scales: Enabling and partnership (4 items), providing general information (4 items), providing specific information about the child (3 items), coordinated and comprehensive care for the child and family (4 items), and respectful and supportive care (5 items). Items 1 to 15 are introduced with the following word stem: "In the past year, to what extent do the people who work with your child…" Items 16 to 20 use a similar word stem: "In the past year, to what extent does the organization where you receive services …" Each item describes a specific behaviour or action, for example, "…help you feel competent as a parent" and "…provide opportunities for the entire family to obtain information." Respondents indicate how often the event or situation happens to them using a 7-point Likert scale ranging from 1 (*not at all*) to 7 (*to a very great extent*). A zero denotes a situation that is not applicable. Respondent data yield five scores, one for each scale. There is no total score, as the scales are examined individually. To compute a scale score, the average of the items' ratings are taken.

Procedure

McGill University's Institutional Review Board approved the study. Following consent to participate, one or both parents were interviewed to obtain diagnostic information and developmental history about their child. Depending on preference, parents either completed the questionnaires independently or answered questions administered by a research assistant in an interview format. Either parent could complete the questionnaires if they considered themselves equally involved and knowledgeable about their child's development. Parents were also given the option to complete the questionnaires together, with the exception of the PSI. Mothers and fathers within the same family were each asked to complete the PSI independently when possible. Among the 96 participating families, 91 mother (community-based, n = 50; centre-based, n = 41) and 82 father (community-based, n = 44; centre-based, n = 38) versions of the PSI were completed.

Results

Preliminary Analyses

Preliminary analyses revealed no significant group differences between children using community-based services and children using centre-based services. Children did not differ significantly in age, $t(94) = 1.30$, $p = .19$; gender, $\chi^2(1, N = 96) = .36$, $p =. 55$; or diagnosis, $\chi^2 (2, N = 93) = 2.56$, $p = .28$. The severity of disorder, as evidenced by the adaptive behaviour and maladaptive behaviour composite scores on the VABS, also did not reveal any significant group differences, $t(74.43) = 1.46$, $p = 1.5$; and $t(79) = 0.47$, $p = .64$, respectively.

Children’s Adaptive and Maladaptive Behaviours

T-tests for the equality of means were computed, and *t*-values, *df*, significance (2-tailed), means, and standard deviations are depicted in Table 2. There were no significant differences between the centre-based and community-based sites for the following adaptive dimensions: adaptability, activities of daily living, functional communication, and leadership. Significant group differences were found for social skills and conduct problems, with children receiving centre-based services displaying fewer conduct problems (e.g., uses foul language, breaks the rules) and children receiving community-based services showing better social skills (e.g., shows interest in others’ ideas, compliments others). The social skills scores for the community-based children fell in the low or at-risk range, whereas the scores for the centre-based children were in the very low or clinically significant range. Significant differences in the conduct problem dimension were found, but scores for both groups fell within the average range. There were no significant group differences for all other maladaptive dimensions: aggression, hyperactivity, anxiety, depression, somatization, atypicality, withdrawal, and attention problems; all ps $> .05$.

Scores for both community-based and centre-based children on the adaptability and anxiety scales of the BASC-2 fell within the average range, whereas their scores on the atypicality scale fell within the at-risk range. Furthermore, children’s scores on the leadership and functional communication domains fell within the low or at-risk range. Community-based children’s scores on the activities of daily living scale fell within the low or at-risk range and centre-based in the very low or clinically significant range.

To better understand the nature of the relationships between adaptive and maladaptive behaviours in each group, we conducted an exploratory correlational analysis, and the results are reported in Tables 3 and 4. In the community-based sample adaptability and functional communication were negatively correlated to maladaptive social-emotional behaviours (i.e., hyperactivity, atypicality, attention problems, and withdrawal). Social skills were also negatively associated with withdrawal behaviour; activities of daily living were negatively correlated with attention problems.

In the centre-based sample adaptability and functional communication were also related most strongly and negatively to maladaptive social-emotional behaviours including hyperactivity, atypicality, attention problems, and anxiety. However, where withdrawal was linked to these adaptive variables in the community-based sample, anxiety was significantly related to them in the centre-based sample. Atypicality and attention problems were also significantly and negatively related to social skills and activities of daily living by children attending centre-based sites. Anxiety was significantly and positively related to all of the adaptive behaviours (i.e., adaptability, social skills, activities of daily living, functional communication, leadership). There was no significant relationship between anxiety and adaptive behaviours in the community sample.

Table 2

T-Tests Scores Between Community-Based and Centre-Based Sites for Adaptive/Maladaptive Behaviour on the VABS

Behaviour	**Community** ***M (SD)***	**Centre** ***M (SD)***	***t***	***df***
Hyperactivity	56.57 (14.98)	54.02 (10.42)	.94	92
Aggression	49.04 (10.95)	45.77 (9.31)	1.55	92
Anxiety	43.31 (10.32)	42.65 (7.97)	.34	89
Depression	48.41 12.90)	47.20 (8.89)	.51	90
Somatization	56.22 (13.24)	52.81 (9.55)	1.41	92
Atypicality	65.73 18.49)	65.31 (14.42)	.12	91
Withdrawal	58.28 12.50)	59.71 (11.08)	-.58	90
Attention problems	59.92 (9.84)	60.47 (8.85)	-.28	92
Conduct problems	57.44 (13.84)	45.10 (8.17)	2.54*	24
Adaptability	42.92 (10.66)	46.60 (9.42)	-1.76	92
Social skills	35.49 (12.04)	30.21 (11.16)	2.17*	91
Activities of daily living	30.59 (11.97)	27.49 (11.58)	1.27	92
Functional communication	30.88 (10.70)	32.17 (8.58)	-.63	91
Leadership	34.41 (10.77)	34.44 (7.55)	-.01	24

**p* < .05

Parent's Perceptions of Disability and Stress

Mothers from centre-based and community-based sites differed significantly on the Spouse index of the PSI, *t*(89) = 2.03, *p* = .05, such that mothers from community-based programs expressed more challenges with their spouses compared to mothers from centre-based programs. Fathers from the community-based sample reported more challenges to their physical health compared to fathers in the centre-based sample, *t*(77.72) = 2.07, *p* = .04.

Parent's Perceptions of Service Providers

T-tests for the equality of means were computed for parent perceptions of service providers; and *t*-values, *df*, significance (2-tailed), means, and standard deviations are depicted in Table 5. Parents from the community-based sites differed significantly from parents from the centre-based sites on the Enabling and Partnership sub-scale, *t*(90) = -2.03, *p* = .05, and the Respectful and Supportive Care sub-scale, t(90) = -2.65, p = .01, of the MPOC-20. More specifically, parents in the centre-based sites had a more positive perception of service providers on the Enabling and Partnership sub-scale of the MPOC-20 compared to those at community-based sites (*M* = 4.70, *SD* = 1.46 vs. *M* = 4.06, *SD* = 1.52). These parents also held more positive beliefs on the Respectful and Supportive Care sub-scale of the MPOC-20 compared to parents in the community-based sites (*M* = 5.82, *SD* = 1.42 vs. *M* = 5.06, *SD* = 1.33).

Table 3

Community-Based Sites' Pearson Correlation Coefficients for Adaptive and Maladaptive Behaviours

Behaviours	**Measure**	**Hyperactivity**	**Aggression**	**Anxiety**	**Depression**	**Somatization**	**Atypicality**	**Attention Problems**	**Withdrawal**	**Conduct Problems**
Adaptability	*R*	-.319*	-.103	.154	-.004	-.042	-.375**	-.487**	-.411**	-.142
	Sig.	.022	.474	.280	.979	.771	.007	.000	.003	.599
	N	51	51	51	51	51	51	51	50	16
Social Skills	*R*	-.091	.072	.227	.125	.102	-.266	-.245	-.375**	.054
	Sig.	.526	.617	.109	.381	.476	.059	.084	.007	.844
	N	51	51	51	51	51	51	51	50	16
Activities of Daily Living	*R*	-.151	.087	.244	.078	.044	-.188	-.279	-.147	-.227
	Sig.	.292	.545	.085	.588	.759	.186	.047*	.307	.398
	N	51	51	51	51	51	51	51	50	16
Functional Communication	*R*	-.299*	-.078	.218	.050	.043	-.350*	-.352*	-.305*	-.141
	Sig.	.033	.586	.124	.727	.764	.012	.011	.031	.604
	N	51	51	51	51	51	51	51	50	16
Leadership	*R*	-.029	.162	.465	.399	.006	.043	-.210	-.177	.130
	Sig.	.911	.534	.060	.113	.983	.870	.419	.512	.060
	N	17	17	17	17	17	17	17	16	17

Note. R, Pearson Correlation; Sig., statistical significance, which is 2-tailed; *N,* sample size; * = $p < .05$; ** = $p < .01$

Table 4

Centre-Based Sites' Pearson Correlation Coefficients for Adaptive and Maladaptive Behaviours

Behaviours	Measure	Hyperactivity	Aggression	Anxiety	Depression	Somatization	Atypicality	Attention Problems	Withdrawal	Conduct Problems
Adaptability	*R*	-.373*	-.067	.409**	-.038	-.131	-.554**	-.486**	-.110	-.105
	Sig.	.016	.679	.009	.818	.415	.000	.001	.499	.772
	N	41	41	40	39	41	40	41	40	10
Social Skills	*R*	-.167	.112	.512**	.077	-.181	-.417**	-.355*	-.072	-.006
	Sig.	.290	.482	.001	.637	252	.007	.021	.653	.986
	N	42	10	40	40	42	41	42	41	10
Activities of Daily Living	*R*	-.277	.015	.336*	.034	-.113	-.558**	-.379*	-.153	-.231
	Sig.	.073	.922	.034	.835	.471	.000	.012	.332	.521
	N	43	43	40	41	43	42	43	42	10
Functional Communication	*R*	-.329*	-.120	.465**	.053	.005	-.537*	-.420**	-.022	-.052
	Sig.	.039	.447	.003	.743	.974	.000	.006	.889	.886
	N	42	42	40	40	42	41	42	41	10
Leadership	*R*	-.389	-.117	.680*	.107	.226	-.646	-.629	-.091	-.099
	Sig.	.301	.764	.044	.785	.558	.060	.069	.815	.799
	N	9	9	9	9	9	9	9	9	9

Note. R, Pearson Correlation; Sig., statistical significance, which is 2-tailed; *N,* sample size; * = $p < .05$; ** = $p < .01$

Table 5

T-Tests Scores Between Community-Based and Centre-Based Sites on the Measure of Processes of Care (MPOC)

Sub-scale	Community *M (SD)*	Centre *M (SD)*	*t*	*df*
Enabling and Partnership	4.06 (1.52)	4.70 (1.46)	-2.03*	90
Providing General Information	3.81 (1.63)	4.26 (1.65)	-1.33	90
Providing Specific Information	4.93 (1.54)	5.12 (1.71)	-0.55	90
Coordinated & Responsive Care	5.02 (1.42)	5.51 (1.46)	-1.63	90
Respectful & Supportive Care	5.06 (1.33)	5.82 (1.42)	-2.65*	90

*$p < .05$

Discussion

The current study examined the similarities and differences between young children receiving services from either a community-based or centre-based site, documenting their adaptive and maladaptive behaviours at one point in time while also considering potentially disparate parental experiences. The results can inform both types of service delivery systems about areas they may want to target for future programming. By and large, the adaptive and maladaptive behaviours of the community-based sample of children were more similar than different from those of the centre-based sample of children. The main differences were in children's conduct problems and social skills. A closer examination provides evidence to suggest that although there were significant group differences for conduct problems, the adaptive and maladaptive behaviours of both groups of children can be classified as falling within the average range of functioning. At first glance, this finding seems counter-intuitive, and in opposition to the findings of previous research, until one examines more closely the nuances that are part of these problems in conduct.

Similarities in Adaptive Behaviour

Concerning adaptability (e.g., ability to adapt to changes in routine, to move from one task to another) both groups fell within the average range. Higher adaptability is strongly related to better overall outcomes (Reynolds & Kamphaus, 2004), which may suggest that these children are developmentally adaptable to changes in their current surroundings. Children's daily living skills, however, fell in the low to very low range, suggesting significant challenges in activities of daily living (e.g., attending to personal safety, fastening buttons on clothing). In addition, both groups of children were seen as falling within the at-risk or clinically significant range in functional communication, leadership, and activities of daily living, which represent several primary areas of dysfunction seen in children with developmental delays and a central area of intervention efforts.

Differences in Adaptive Behaviour

Regarding social skills, although behaviours of the community-based sample were within the at-risk range, they were perceived as exhibiting significantly stronger social skills than the centre-based sample, who were found to be within the clinical spectrum of severity. Children within the centre-based sites may have more significant needs, which may have a larger impact on the actual execution of their social skills. Less effective social behaviours could be related to other deficits in adaptive functioning or require additional evaluation and more intensive intervention. The children from the centre-based sites had a higher proportion of their day in one-on-one individualized care with fewer opportunities for socialization with peers, and this too, may be related to a stronger need for intensive intervention services.

Similarities and Differences in Maladaptive Behaviour

Children in both settings were seen as at risk regarding atypicality, which refers to the tendency for children to behave in ways that others consider to be strange or odd (Reynolds & Kamphaus, 2004). Because elevated scores in this domain may suggest clinical problems (e.g., from hyperactivity to disconnectedness to reality and surroundings), astute clinical judgments and clinical interviews would need to be conducted to interpret the significance of elevated atypicality. However, children with ASD, for example, exhibit behaviours such as poorly integrated verbal and nonverbal communication, abnormalities in use of body language or gestures, and stereotypical behaviours (e.g., lining up of toys, flipping objects; American Psychiatric Association, 2013), which likely accounts for the elevated ratings in our sample. Finally, children in the community-based sample were seen as having more conduct problems compared to those in the centre-based sample. It is important to note, however, that both groups were within the average range of functioning.

Relationships Between Adaptive and Maladaptive Behaviours

When viewing the relationships between adaptive and maladaptive behaviours, several findings emerged. In particular, the lack of ability to adapt to situations and the environment was closely related to several domains of social-emotional functioning in both groups, including, hyperactivity, atypicality, attention difficulties, anxiety, and withdrawal. This may suggest that children’s difficulty adapting to environmental needs may lead to a host of other challenges; the reverse may also be true (i.e., difficulties with anxiety or attention may be related to adaptive challenges). For instance, many children with ASD experience significant challenges adapting to new environments and this can often lead to other challenges such as aggression or tantrums (Sterling-Turner & Jordan, 2007). Regardless of the directionality, this finding strongly underscores the continued importance of an intervention focus on adaptive skill development.

While children in both the community-based and the centre-based settings registered a level of anxiety that fell within the average range, an increased or normal level of anxiety was related to better adaptive functioning in the centre-based sample. For example, anxiety, at normal levels, is an adaptive function that facilitates the processing of sensory stimuli and prompts the activation of defense mechanisms (Baas, Milstein, Donlevy, & Grillon, 2006). The positive relationship between adaptive behaviours and anxiety in the centre-based sample may indicate that normal levels of anxiety can be related to adaptive behaviour in this sample of children.

Parent Stress

Parents of children in the community-based settings experienced more perceived parenting stress than those in the centre-based setting. Mothers in the community-based setting expressed more challenges with their spouses, and fathers in these settings reported numerous challenges to their physical health compared to mothers and fathers in the centre-based settings. These results suggest that mothers and fathers in the community-based setting both experienced parenting stress; however, the stress was experienced in different ways. Gau et al. (2012), in an investigation of family functioning in families of children with ASD, found that mothers reported higher rates of marital maladjustment than fathers of children with ASD. Although family dynamics are evolving, mothers in North America have historically been the primary caretakers of children in families. It is possible that the mothers in the community-based settings in our sample took on a primary role in their child's well-being, while also experiencing a lack of spousal support. Similarly, Foody, James, and Leader (2015) found that mothers of children with ASD experience more parenting responsibility than fathers. The authors also found that fathers of children with ASD had higher blood pressure and heart rate variability than mothers, which support our current findings of elevated physical health problems in fathers in the community-based setting.

Family-centred care can help alleviate some of the pressures involved in raising a child with a developmental delay (King, Teplicky, et al., 2004). Families in the centre-based settings expressed more satisfaction with services than those in the community-based settings. The perceived care and support in the centre-based settings may have acted as a protective factor for parental well-being. Researchers suggest that coping and social support can have a buffering effect for families of children with developmental disabilities (Cantwell, Muldoon, & Gallagher, 2014; Van Riper, 2007).

Raghavendra, Murchland, Bentley, Wake-Dyster, and Lyons (2007) recommended that health care professionals need to improve means of knowledge dissemination in order to enhance families' perceptions of the provision of information about service models, as well as to work with professionals using a consultative approach. Ideishi, O'Neil, Chiarello, and Nixon-Cave (2010) suggested that service providers receive appropriate training in team building, service systems, and knowledge about child development: "Family-centered strategies emphasizing systems of care are recommended to improve therapists' role in care coordination" (p. 28–29). Future research can help elucidate the particular components of each system of service delivery, which contribute to the experiences of families.

In recent years, child-centred programs have made a large shift from focusing services on children's needs to incorporating and planning to meet the diverse needs of families as a whole (Ahmann & Johnson, 2000; Arango, 2011; Cunningham & Rosenbaum, 2014; Murphy, Lee, Turnbull, & Turbiville, 1995). Parents hold positive perceptions of family-centred practices; and furthermore, parental involvement and training leads to positive child and family outcomes (Kingsley & Mailloux, 2013). Additionally, family-centred practices can have a positive impact on child and family outcomes (Kuhlthau et al., 2011; Kuo, Bird, & Tilford, 2011). Guralnick's (2005b) developmental systems model of EI placed families precisely at the centre, emphasizing the importance of enabling and empowering families of at-risk children. Guralnick stated that the primary goal of EI is to optimize: "1) the quality of parent-child interactions, 2) family-orchestrated child experiences; and 3) health and safety- provided by the family" (Guralnick 1998, as cited in 2005b, p. 7).

Furthermore, to support children's needs, parents also need to be nurtured and supported. Our findings suggest that, although not always the most feasible (e.g., families in rural areas, the cost of services), a "shop under one roof" model of service delivery may be better able to meet the needs of families than a "hub" model of service delivery. While this study supports the use of family-centred services, there is still presently a lack of research of evidence-based service delivery models, particularly centre-based models. Practitioners must often rely on intuition rather than research to make decisions regarding best practices (Cirrin et al., 2010). Future research needs to continue to further elucidate components of service delivery models most related to positive child and family outcomes.

In this article we have illuminated some of the experiences of parents and their children participating in community-based or centre-based settings, in order to add to the literature as it relates to factors that may need to be considered in delivering tailor-made programs to families. Thus, children's adaptive and maladaptive behaviours need to be further examined within the context and awareness of a multitude of factors including the impact on parental stress and the positive and negative impact of a child's delay or disability on the family. Ideally, we would want to examine how these factors change over time and examine intervention programs longitudinally, beginning with infants and continuing to study the effects of intervention through the primary school years and beyond (Feldman, 2008).

Children with developmental delays who attend community-based or centre-based programs exhibit difficulties in several domains of functioning, and these challenges must be addressed to facilitate positive outcomes. Both settings offer specific programs to meet these difficulties. Our findings suggest that parents struggle with the significant challenges associated with caring for a child with a developmental delay who also exhibits maladaptive behaviours. Service delivery models must consider the apparent needs of families and develop holistic, dynamic intervention programs. It appears that a combination of services is ideal for providing supports and services to families who need it most.

Parent Experiences with Service Providers

Compared with parents from community-based settings, families in centre-based settings held more positive perceptions of receiving respectful and supportive care and of feeling enabled in their partnerships with service providers. Respectful and supportive care is present when professionals have the ability to understand the impact of a child's disability on family life and know how to respond to the emotional and informational needs of the family (King, Teplicky, et al., 2004; King, Rosenbaum, & King, 1995). Perceptions by parents as to a genuine partnership with service providers and feeling enabled may mirror families' involvement and decision-making capacity with service providers (King et al., 1995) and includes providing opportunities for parents to make decisions about interventions. The opportunity for daily communication in a centre-based site may lend itself to more actual support and opportunities for active participation for families. Daily interactions and the ability to forge a close relationship with educators, speech and language pathologists, occupational therapists, and so on, allow parents to observe the extent and quality of the care their children are receiving. In contrast, parents whose children receive services from community-based sites may not have the same opportunities to become more intimately involved in all aspects of their child's care (for example, the parent may not be present when their child receives speech and language therapy). It is important to note that families in centre-based settings reported that their children had significantly lower social skills, compared to those in community-based settings. Parental perceptions of children's behaviours may have an impact on how families view services (e.g., parents with children in more need may view professionals as an essential resource).

While it may be challenging for community-based sites to engage with parents as frequently as centre-based sites, some aspects of collaborative service delivery may require few resources such as respect, commitment, equality, and trust (Blue-Banning, Summers, Frankland, Nelson, & Beegle, 2004). Blue-Banning et al.'s qualitative investigation of family and professional partnerships "underscored the point that common sense and ordinary human decency are at the heart of positive partnerships between families and professionals serving children with disabilities" (p. 181). Therefore, community-based programs may overcome some of their perceived limitations (e.g., time, resources) and establish mutual trust and commitment with families through other means such as being reliable, discreet, and non-judgmental (Blue-Banning et al., 2004).

Limitations and Future Research Directions

This study was not without its limitations, and additional research is needed to expand our understanding of the similarities and differences between diverse service delivery models. As we depicted in Figure 1, there is considerable overlap between the centre-based and community-based models that we chose to examine, and each construct in and of itself warrants further investigation. Ultimately, parents, service providers, and policy makers need to know how best to use available resources. We need to be able to determine what types of service delivery models are the most useful for children with particular types of developmental delays or disabilities and their families. This is no simple task, as the complexity of the children's characteristics and needs, family needs, and service providers' ability to match services with needs are profound. In light of this complexity, we have attempted to define, as clearly as possible, the similarities and differences between centre-based and community-based service delivery systems and are aware that many other constellations of service provision exist. However, centre-based and community-based EI delivery models were seen as examples of service delivery models that would resonate with other intervention service providers and provide meaningful information about how different service models impact children with developmental delays and their families. Thus, we recognize the limits of the study regarding its generalizability.

Relying only on parent ratings of children's adaptive and maladaptive behaviour limits the conclusions that can be made, and there is the potential for response bias. There is much controversy in the field as to the dangers of response bias. However, as it relates to our study, we point to the statement by Gresham and Elliott (2014):

> Rating scale technology today represents one of the primary and most efficient methods used by researchers to describe and categorize children's behaviours and attitudes … Well designed behaviour rating scales essentially are raters' summary characterizations of recent observations and experiences with children or youth. (pp. 158–159)

Another potential limitation of our study is that only one measure utilized in the study (i.e., the PSI) collected both mother and father ratings. Under ideal circumstances, having mother and father ratings for all of the measures would have added another important dimension to the study. Doing so was not a feasible or viable option. Nevertheless, the mother and father responses to the PSI revealed distinct differences related to spousal relationships and parental stress—information we believe is important for service providers to consider when addressing these issues.

Future researchers can expand upon our study by (a) replicating the general comparison and expanding the types of service delivery models under examination; (b) using multiple informants and multi-methods; (c) looking at a change in behaviours across time; and (d) whenever possible, obtaining both mother and father ratings. Also, the complexity of different service delivery models and the impact of various components on parent and child outcomes need to be disentangled. Doing so will ultimately facilitate predictions about which model is the most effective for which type of child and family. One can expect that a program geared toward the single parent of a child with ASD (for example) from an impoverished area may have both similar and different features compared to a program geared toward the single parent of a child with ASD from middle- or upper-class areas (e.g., Feldman, 2008). Extending this example; however, one would ultimately want to know which specific intervention services (e.g., respite, one-on-one educator, social skills instruction) lead to better outcomes. Still, despite these limitations, our study is one of the first (to our knowledge) to compare service delivery models for Canadian children with developmental delays and their families and to report on various aspects of child and family functioning. Children with developmental delays and their families need appropriate, timely, and individualized services; and it is imperative to continue to investigate the most effective service delivery models, and components thereof, to best serve this vulnerable population.

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Correspondence concerning this article should be addressed to Ingrid Sladeczek, Department of Educational and Counselling Psychology, McGill University, Room 614, Education Building, 3700 McTavish Street, Montreal, Quebec, H3A 1Y2. Email: ingrid.sladeczek@mcgill.ca