



Longitudinal effects of a two-generation preschool programme on receptive language skill in low-income Canadian children to age 10 years

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ABSTRACT

We explored longitudinal effects of a two-generation preschool programme on receptive language scores in children ($n = 78$) at age 10 years, living with low income. Scores at four time-points, programme intake, exit, age 7, and age 10 years were measured using the *Peabody picture vocabulary test* (3rd ed.). Effects of culture (Aboriginal, other Canadian-born, and recent immigrant), and gender of the children were explored. Between programme intake and age 10, scores improved significantly, $F(3, 75) = 21.11, p < .0005$. There were significant differences among cultural groups at all time-points except age 10. Scores differed significantly for girls, but not boys, at age 10, $F = 5.11, p = .01$. Recent immigrant boys reached the Canadian average, while girls were two-thirds of the standard deviation below average. Early intervention programmes must include a focus on the unique circumstances of recent immigrant girls; supportive transition workers in schools are one recommendation.

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More than 25% of children living in Canada have delayed development at school entry (Alberta Education, 2014), leading to difficulties with lifelong learning and health. The gradient effect of poverty on children's risk for developmental delay puts children in the poorest families most at risk (Hertzman & Boyce, 2010). Poverty in Canada has not been officially defined, but includes the inability to obtain the necessities of life such as food, clothing, shelter, and transportation (Collin & Campbell, 2008). Low income is more clearly defined, and is less than half the low-income cut-off (LICO), or when a family spends 20% more of its annual budget on food, shelter, and clothing than the average Canadian family (Statistics Canada, 2011–2012). The LICO for an urban-dwelling family of four before tax was \$36,107 in 2002 and \$43,942 in 2012 (Statistics Canada, 2011–2012). There are an increasing number of families in Canada living with low income, and children in these families experience innumerable disadvantages.

Children living with low income are likely to experience detrimental long-term effects on behaviour, cognitive development, emotional and physical health, and school achievement (Brooks-Gunn & Duncan, 1997; Spencer, Thanh, & Louise, 2013). Economic disparities begin prenatally (Oliver & Hayes, 2005), and are sustained through lower parental education, unemployment, and living in a risky neighbourhood (McEwen & Stewart, 2014; Oliver & Hayes, 2005). Lack of cognitive stimulation and unresponsive parent-child interactions negatively affect brain development (Hackman, Farah, &

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Meaney, 2010). Exposure to abuse and neglect affects learning, behaviour, and health through sustained activation of the body's stress response system, with lifelong effects (Fox, Levitt, & Nelson, 2010; Shonkoff & Garner, 2012). In contrast, early positive experiences such as reciprocal 'serve and return' interactions with parents, family members, and primary caregivers build healthy brain architecture (Fox et al., 2010). Two-generation, early intervention programmes are one strategy to effect positive change in children's environments, promoting school readiness, and contributing to child and family well-being (Anthony, King, & Austin, 2011). School readiness is the ability to respond adequately in cognitive-academic and social-emotional-behavioural ways to the demands of a school setting (Carlton & Winsler, 1999). School readiness improves children's self-efficacy, motivation, and resilience; increases achievement of healthy behaviour; and is a reliable marker for later health and success (Pagani & Fitzpatrick, 2013). Receptive language is a proxy measure of school readiness (Ryan, Fauth, & Brooks-Gunn, 2013), and school readiness is negatively affected by low income.

Considerations of culture

We compared children of three cultural groups at CUPS One World: Aboriginal (First Nations, Métis, or Inuit), other Canadian-born, and recent immigrant (within 10 years at study intake). Aboriginal people are strong and resilient, with a holistic world view that has the potential to contribute to the overall health and well-being of all Canadians (Kirmayer, Simpson, & Cargo, 2003; National Collaborating Centre for Aboriginal Health, 2013). Colonisation produced unimaginable adversity through the residential school system (Knopf, 2008), and intergenerational effects of this forced assimilation have affected individual as well as collective health (Waldram, Herring, & Young, 2006). Compared with other Canadians, Aboriginal people have lower life expectancies and education levels combined with higher rates of poverty, incarceration, family violence, crowded living conditions, accidents, homicides, addictions, major depression, history of sexual abuse in childhood, chronic disease, infectious disease, obesity, maternal morbidity and mortality, infant and young child mortality, food insecurity, malnutrition, stunted growth, and suicide rates (Mikkonen & Raphael, 2010; National Collaborating Centre for Aboriginal Health, 2013; Tjepkema, 2002; Tjepkema, Wilkins, Senecal, Guimond, & Penney, 2009; Wilkins, Houle, Berthelot, & Ross, 2000). Aboriginal people make up 4.3% of Canada's population (Statistics Canada, 2013a), are growing six times faster than the non-Aboriginal population, and are younger, with half under 24 years of age (The Environics Institute, 2012). Of Canadian children age 14 years and under in government care, a disproportionate number (48%) are Aboriginal (Statistics Canada, 2013a). Aboriginal children are more likely to experience poorer health than other Canadian-born children, and to achieve developmental language outcomes later (Findlay, Kohen, & Miller, 2014).

Canadian-born children living in low-income families are at risk of ineffective parenting, stress, and family dysfunction (Beiser et al., 2011). In 2002, 10% of urban-dwelling families of four lived below the LICO (Vanier Institute of the Family, 2008); in 2006, this increased to 12.8% (Statistics Canada, 2006), and is presently 14.9% (Statistics Canada, 2011–2012). Of Canadian children who live in one-parent families headed by mothers, 39% live with low income (Vanier Institute of the Family, 2008).

Recent immigrants are more likely to be living in poverty and with low social support than other Canadian families (Séguin et al., 2012; Van Hulst, Séguin, Zunzunegui, Vélez, & Nikiéma, 2011). Foreign-born children are more likely to experience poverty than Canadian-born children, but with fewer emotional and behavioural health problems than other Canadian-born children in poverty (Beiser et al., 2011). Although strong family support contributes positively to healthy development of immigrant children, they also require concrete academic support in order to achieve academic success (Este & Van Ngo, 2011). Immigrant children experience more stressors than other children, which are compounded during adolescence, with increased potential for involvement in gangs, criminal activity, violent behaviour, and drug and alcohol use (Este & Van Ngo, 2011). Foreign-born people make up 20.6% of Canada's population, and 19.2% of immigrants are children under the age of 14 years (Statistics Canada, 2013b).

Considerations of gender

Male gender is a risk factor for speech and language delay in preschool children (Nelson, Nygren, Walker, & Panoscha, 2006). Typically, girls surpass boys in vocabulary skills up to age 12 years, reflecting earlier maturation and capacity (Bornstein & Haynes, 1998; Hayiou-Thomas, Dale, & Plomin, 2012).

Research purpose and questions

The purpose of this study is to determine the longitudinal effects of a two-generation preschool programme on children's receptive language to age 10 years. The research questions are as follows: (a) were the effects of a two-generation preschool programme on child receptive language scores sustained up to age 10 years; (b) do these effects vary by culture (Aboriginal, other Canadian-born, and recent immigrant); (c) do these effects vary by gender; and (d) do these effects vary by gender within cultural groups?

Methods

Participants

Between December 2002 (programme start) and October 2008, 134 children and 79 caregivers participated in the study. Eligibility for the two-generation programme at CUPS One World included low income, and one or more risks for developmental delay such as parental mental illness, addiction, and lack of social support. Eligibility for the longitudinal follow-up study included enrolment in the programme for at least three consecutive months. Eligibility criteria for the programme and the present study are described fully in previous publications (Benzies et al., 2010, 2012). This longitudinal study was approved by the University of Calgary Conjoint Health Research Ethics Board (E ID #17566).

Follow-up data were available for 112 children at programme exit, 73 children at age 7 years, and 62 children at age 10 years. At age 10 years, we observed a significant difference in culture, with more recent immigrants participating than the other two cultural groups, concurring with findings at age 7 years (Benzies et al., 2012). At age 10 years, the sample comprised 27% Aboriginal, 37% other Canadian-born, and 36% recent immigrant children; most attrition at the age 10 follow-up occurred in the Aboriginal group, which decreased from 34% at intake to 27% at age 10 years. There were no significant differences in caregiver age, marital status, or child gender between those who participated in the study at age 10 years and those who did not. However, there was a significant difference in parental education at age 10 years, with parents who completed high school more likely to participate in the follow-up than those who did not. At age 7 years, there were no differences in parental education for those who completed the follow-up study and those who did not (Benzies et al., 2012).

The two-generation preschool programme

Calgary Urban Project Society (CUPS) Health Education and Housing Centres offers multiple programmes and services to facilitate resiliency in low-income families in Calgary, AB, Canada (CUPS Health and Education, 2010). CUPS One World Child Development Centre (hereafter referred to as CUPS One World) is a two-generation preschool programme that promotes school readiness and early childhood development through strengthening children's proximal environmental resources, providing access to centre-based early learning, and increasing parental psychosocial resources (Benzies et al., 2012). Children attend four days per week, five hours per day, with year-round programming, bussing, and provision of breakfast, lunch, and snacks. The curriculum builds on children's interests to motivate learning, teacher/child ratios are 1:8, and caregivers are encouraged to participate fully in children's classroom and recreational activities. Preschool teachers and social workers

visit each home several times per year. Access to community health nurses, pediatricians, dental, vision, and hearing screenings is ensured. Caregivers attend a six-week series of parenting and life skills classes. CUPS One World is a clinical practicum site for students from nursing, social work, and early childhood education. Details of the parent education and family support components of the two-generation programme are described fully in another publication (Benzies et al., 2009).

Measurement

The *Peabody picture vocabulary test* (3rd ed.) (PPVT III) is an age-standardised, norm-referenced, observational measure of receptive vocabulary for individuals aged 2.5 to over 90 years (Dunn & Dunn, 1997). There are 204 test items grouped into 17 sets of 12 items each. Each item consists of four black-and-white illustrations on a page (picture plate) arranged in order of increasing difficulty. The test-taker must select the picture that best represents the meaning of a word read by the examiner, and most individuals complete five sets, or 60 items. A raw score is obtained by subtracting the number of errors from the total ceiling score; higher scores indicate better receptive vocabulary. Raw scores can be converted to age-referenced normative scores such as standard scores, percentiles, stanines, normal curve equivalents, and age equivalents. The PPVT III correlates well with other measures of vocabulary, and moderately well with other tests of verbal ability (Dunn & Dunn, 1997). Test-retest reliability ranges from .88 to .96 and Cronbach's α from .92 to .98. The PPVT III is simple to administer, is untimed, and can be completed in 11–12 minutes. We used PPVT III standard scores for this study.

Procedures

Caregivers of children consented to participate, and with children's assent, receptive language testing was conducted by trained research staff. While the child attended CUPS One World, receptive language testing was completed at the centre. At age 7 and 10 years, families were contacted by letter, phone, email, or Facebook (www.facebook.com; Mychasiuk & Benzies, 2012), and visited at home as close as possible to their child's birthdays. FaceTime (<https://www.facebook.com/applefacetime>) was used to complete receptive language testing with the children of one family living in an isolated area.

Data imputation and analyses

Ideally, children in the study would have had receptive language testing using the PPVT III at programme intake, yearly while in the programme, at programme exit, age 7, and age 10 years. Therefore, some of the children had up to seven completed PPVT III tests. For the purposes of our study, if a child was missing a PPVT III score at one time-point, but had data for a minimum of three other time-points, we imputed data at one missing time point in order to retain as much of our sample as possible. We imputed nine PPVT III scores at age 7 years by calculating the means of the two adjacent scores. We imputed 19 PPVT III scores at age 10 years by calculating means of all available scores (except intake score). Of the 312 PPVT III scores in our data set, we imputed 28 (9%). After imputing, 78 children had PPVT III scores at four time-points, intake, exit, age 7, and age 10 years. Data analyses with and without imputation of scores did not alter the level of statistical significance. Correlation analyses demonstrated significant relationships between PPVT III scores at programme exit and age 7 years, and between age 7 and 10 years (see discussion). This implies that the previous PPVT III score of the child is the best predictor of their next score, confirming our process for imputation of 28 scores.

We used repeated measures to compare receptive language scores in children at four time-points. A one-way analysis of variance (ANOVA) was conducted to compare receptive language scores based on culture and gender among the three cultural groups (Aboriginal, other Canadian-born, and recent

immigrant) at four time-points. A two-way between-groups ANOVA was conducted to compare the effects of receptive language scores on culture and gender. *Post hoc* analyses were performed using Bonferroni correction, and effect sizes were calculated using eta squared (η^2). All analyses were completed using SPSS version 22.0, with a p value $< .05$ considered as significant.

Results

Demographic characteristics of participants, and percentages of receptive language scores in clinical range are presented in Table 1.

Comparison of scores to age 10 years

The effects of a two-generation preschool programme on children's receptive language scores were sustained until age 10 years. Children's receptive language scores improved significantly between intake and age 10 years, $F(3, 75) = 21.11$, $p < .001$, $\eta^2 = .46$, but no significant improvement was observed in receptive language scores between programme exit and age 7 years, or programme exit and age 10 years. This is congruent with previous results, where no significant difference was noted in receptive language scores between programme exit and age 7 years (Benzies et al., 2012). There was a slight decrease in receptive language scores from exit to age 7 years (mean difference = 1.36). At age 10 years, receptive language scores of children equalled those at programme exit (see Table 2).

Comparison of receptive language scores based on culture

Different effects of the two-generation preschool programme on receptive language scores were observed within three cultural groups (Aboriginal, other Canadian-born, and recent immigrant). A one-way ANOVA was conducted, demonstrating significant differences among the three cultural groups at all time-points except age 10 years. *Post hoc* analyses identified significant differences in receptive language scores between programme intake, exit, and age 7 years for recent immigrants and other Canadian-born children. Recent immigrant children showed the greatest improvement in receptive language scores between age 7 and age 10 years (mean increase = 3.32) (see Table 2).

Table 1. Socio-demographic characteristics and percentages of PPVT III scores in clinical range.

Variables	Aboriginal		Other Canadian-born		Recent immigrant		All N	Frequency (%)
	n ^a	Frequency (%)	n	Frequency (%)	n	Frequency (%)		
<i>Children</i>								
Gender (% male)	21	11(52)	29	15(52)	28	14(50)	78	40(51)
Child age (months)	21	129(21.7)	29	121.7(4.7)	28	120.5(3.6)	78	123.2(12.1)
PPVT III % in clinical range at intake	21	6(29)	29	6(21)	28	14(50)	78	26(33)
PPVT III % in clinical range at exit	21	4(19)	29	2(7)	28	8(29)	78	14(18)
PPVT III % in clinical range at age 7	21	4(19)	29	4(14)	28	9(32)	78	17(22)
PPVT III % in clinical range at age 10	21	2(10)	29	2(7)	28	7(25)	78	11(14)
<i>Caregivers</i>								
Caregiver age (years)	15	39.9(7.2)	22	40.7(6.5)	18	41.4(6.2)	55	40.7(6.5)
Partnered	11	7(64)	17	11(65)	16	10(63)	44	28(64)
Completed high school	11	6(55)	20	17(85)	18	15(83)	49	38 (78)
File opened with child welfare as a child	15	10(67)	22	6(27)	18	0(0)	55	16(29)

Note: PPVT III = *Peabody picture vocabulary test* (3rd ed.).

^aSample size varied due to missing; 78 children with 56 caregivers.

Table 2. PPVT III mean scores by cultural groups at four time-points.

PPVT III scores	n	Aboriginal	n	Other Canadian-born	n	Recent Immigrant	N	All
		M (SD)		M (SD)		M (SD)		M (SD)
Intake	21	86.90(16.97)	29	95.48(14.38) ^a	28	80.39(17.38) ^a	78	87.76(17.27)*
Exit	21	98.38(13.26)	29	102.14(10.53) ^a	28	93.32(11.44) ^a	78	97.96(12.09)
Seven years	21	97.10(11.41)	29	100.76(13.22) ^a	28	91.93(13.74) ^a	78	96.60(13.35)
Ten years	21	97.90(9.18)	29	100.62(11.25)	28	95.25(12.43)	78	97.96(11.29)*

Note: PPVT III = *Peabody picture vocabulary test* (3rd ed.).

^aPost hoc analyses showed significant differences between groups.

* $p < .001$.

Comparison of receptive language scores based on gender

Receptive language scores of boys and girls were compared at four time-points among the three cultural groups. In boys, there were no significant differences in receptive language scores at any time-point among the three groups. Girl's receptive language scores differed significantly at four time-points: intake $F(2, 35) = 6.489$, $p < .01$, $\eta^2 = .27$; exit $F(2, 35) = 3.547$, $p = .04$, $\eta^2 = .17$; age 7 years $F(2, 35) = 4.988$, $p = .01$, $\eta^2 = .22$; and age 10 years $F(2, 35) = 5.115$, $p = .01$, $\eta^2 = .27$. Post hoc analyses demonstrated significant differences in receptive language scores between other Canadian-born and recent immigrant girls at programme intake, age 7 years ($p = 0.01$), and age 10 years ($p < .01$); however, these differences were not significant at study exit (see Table 3).

Comparison of receptive language scores based on culture and gender

A two-way ANOVA was conducted to explore the impact of gender and culture on receptive language scores at four time-points. The interaction effect between gender and culture was statistically significant at age 10 years, $F(2, 72) = 3.548$, $p = .03$, $\eta^2 = .09$, but was not significant at any other time-points. There was a statistically significant effect of culture on receptive language scores at intake, exit, and age 7 years. Post hoc analyses indicated statistically significant receptive language scores between other Canadian-born and recent immigrant children. This effect of gender on receptive language scores was not statistically significant at intake and exit; however, it was significant at age 7 years, $F(2, 72) = 6.20$, $p = .01$, $\eta^2 = .08$.

Comparison of receptive language scores by gender within cultural groups

Receptive language scores of boys and girls were compared within each cultural group. At age 10 years, Aboriginal and other Canadian-born boys were outperformed by girls, while recent immigrant boys performed better than girls. There was a marked difference in mean scores between recent immigrant boys and girls at age 10 years; boys $M = 100.29$, $SD = 13.19$, and girls $M = 90.21$, $SD = 9.60$.

Table 3. PPVT III mean scores by gender at four time-points.

PPVT III scores	Aboriginal boys	Other Canadian-born boys	Recent immigrant boys	Aboriginal girls	Other Canadian-born girls	Recent immigrant girls
	M (SD)	M (SD)	M (SD)	M (SD)	M (SD)	M (SD)
Intake	84.64(19.06)	96.13(14.73)	86.14(17.28)	89.40(14.93)	94.79(14.52) ^a	74.64(16.04) ^{a,**}
Exit	97.00(12.82)	103.93(11.38)	96.43(12.50)	99.90(14.25)	100.21(9.57)	90.21(9.72)*
Seven years	100.82(11.06)	101.60(14.81)	97.86(13.20)	93.00(10.86)	99.86(11.77) ^a	86.00(11.93) ^{a,**}
Ten years	97.73(9.42)	98.20(9.52)	100.29(13.19)	98.10(9.42)	103.21(12.69) ^a	90.21(9.60) ^{a,**}

Note: PPVT III = *Peabody picture vocabulary test* (3rd ed.).

^aPost hoc analyses showed significant differences between groups.

* $p < .05$.

Discussion

In our study, receptive language scores were sustained to the age of 10 years. These scores were not correlated with caregiver marital status, education level, or children's services files (for caregiver or child). Significant correlation was demonstrated between programme exit scores and age 7 scores, $r = 0.701$; $n = 78$, $p < .01$. Similarly, significant correlation was demonstrated between age 7 and age 10 scores, $r = 0.712$, $n = 78$, $p < .01$. Although fade-out effects have been noted in early intervention programmes (Anderson, Foster, & Frisvold, 2004), positive long-term effects of two-generation preschool programmes in the US. demonstrated increased language development, increased high school completion, and completion of more years of education (Karoly, Kilburn, & Cannon, 2005; Reynolds & Temple, 2008; Reynolds, Temple, White, Ou, & Robertson, 2011; Wasik, Bond, & Hindman, 2006).

Between age 7 and 10 years, receptive language scores improved slightly for Aboriginal children, decreased slightly for other Canadian-born children, and increased considerably for recent immigrant children. Among Canadian families living with low income, there may be protective effects for those of recent immigrant status; immigrant children have lower behaviour problems and higher school performance than other Canadian-born children living with low income (Georgiades, Boyle, & Duku, 2007).

At age 10 years, receptive language scores improved for 36% of the boys and 63% of the girls; girls typically outperform boys in verbal and language skills (Hayiou-Thomas et al., 2012). Receptive language scores of boys among the three cultural groups showed varying trends. At programme intake, receptive language scores of Aboriginal boys were more than one standard deviation below average, while those of other Canadian-born and recent immigrant boys were less than one standard deviation below average. There exist significant gaps in educational and language policies for Aboriginal people in Canada, which contribute to poorer educational outcomes (Haque & Patrick, 2014). Aboriginal boy's scores improved at exit and age 7 years, and dipped at age 10 years. Other Canadian-born boy's scores improved only at exit and then decreased at age 7 and 10 years. Recent immigrant boy's scores improved at all time-points, and at age 10 their scores were within the average range for Canadian children. Receptive language scores were higher for recent immigrant boys than Aboriginal and other Canadian-born boys at age 10 years. Supportive family ties and strong social cohesion in some immigrant families may positively influence bilingual language development in boys; for girls, supportive family ties may be more restrictive, decreasing opportunities for language development due to extra familial responsibilities (Lutz & Crist, 2009).

Changes in receptive language scores of girls were the same among all the three cultural groups. For girls, receptive language scores increased at exit, decreased at age 7 years, and increased at age 10 years. This increase in receptive language scores at age 10 years was significantly correlated with gender. In contrast, for recent immigrant girls, receptive language scores differed significantly from other girls at all time-points, except at programme exit. At programme intake, receptive language scores of recent immigrant girls were more than one standard deviation below average, while those of Aboriginal and other Canadian-born girls were less than one standard deviation below average. Moreover, recent immigrant girl's scores were one-third of a standard deviation lower than that of Aboriginal and other Canadian-born girls at the four time-points.

The comparison of receptive language scores between boys and girls within each cultural group showed no difference, except for recent immigrants. At age 10 years, the receptive language scores of recent immigrant girls decreased the overall mean scores for their cultural group, even though recent immigrant boys markedly improved their receptive language skills. These findings may relate to gender-based differences in acculturation for recent immigrants. Recent immigrant girls have increased potential for psychosocial distress in social and cultural connectedness, a sense of belonging, and mental health (Hilario, Vo, Johnson, & Saewyc, 2014). Investigation of sustained positive effects of early intervention for participants from CUPS One World is essential, but of significant concern are recent immigrant girls, who demonstrated lower receptive language scores than the other girls.

Limitations

Of the 134 children originally enrolled in this study, 42% were lost to follow-up; attrition in longitudinal studies is expected, especially with vulnerable populations (Horowitz, Ladden, & Moriarty, 2002). Of the children lost, 43% were Aboriginal, with similar attrition noted at the age 7 follow-up (Benzies et al., 2012). Participant attrition is an area for further research. The sample size of this study was small due to the intensity and cost of the programming at CUPS One World. There are spaces for 50 families per year in the programme, and were never enough families to create a wait-list control group. There is clear evidence that early intervention programmes make a positive difference in children's outcomes; therefore, withholding programming for some in order to have a control group for this study is not ethical. Confounding factors affecting receptive language scores at age 10 years may include moving from below to above the LICO, and parents/caregivers increasing their education. An increased focus on connections between caregiver psychosocial characteristics and children's developmental outcomes is an area for further research. Another area for exploration is how values and beliefs of recent immigrant families may affect children's developmental outcomes, in particular, those of new immigrant girls.

Policy implications

Findings of this longitudinal study to age 10 years of children living in low-income families provide several implications for policy-makers. We have identified that young immigrant girls may benefit the most from continued targeted intervention; this may become even more essential as they reach adolescence (Hilario et al., 2014). Immigrant children may experience socialisation into a new culture differently than their parents; in particular, when immigrant girls reach adolescence, they may experience conflict between cultural constraints and societal freedoms in a new country (Coll & Magnuson, 2001). Further research regarding cultural differences of immigrants from varying countries is an area for exploration (Vang, Sigouin, Flenon, & Gagnon, 2015). Sustained funding for early childhood and youth intervention programming for immigrant children and youth is essential (Este & Van Ngo, 2011).

Transition to school is a time of increased stress for children, especially those in low-income families, and those with limited language skills (Wong, 2014). The transition from intensive supportive early intervention programming to public neighbourhood schools may have been a difficult adjustment and resulted in decreased receptive language scores at age 7 years. By age 10 years, most children may have adapted to moving from the supportive programme environment, to the public school system, demonstrating increases in their receptive language scores overall. Initially, supportive transition workers for children leaving CUPS One World and transitioning into schools were part of programming, but were discontinued due to lack of funding. Supportive transition workers may be especially strategic for new immigrant girls. Provision of familiar, on-site, supportive transition workers for children may facilitate the transition to the children's neighbourhood school. Ongoing longitudinal research with this group of vulnerable families is warranted, with a focus on recent immigrant girls, and retention of Aboriginal participants.

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Notes on contributors

Dr Karen Benzies, Professor, Faculty of Nursing, University of Calgary, has been the lead researcher in the community-university partnership since Calgary urban project society (CUPS) One World was established. Benzies brings expertise in early childhood development, developmental screening, early childhood interventions, family resiliency, as well as longitudinal and multiple methods research designs.

Dr Kashif Mughal (Postdoctoral Fellow, University of Calgary Eyes High Postdoctoral Fellow programme) has worked on a number of clinical research projects throughout his undergraduate and postgraduate education. Mughal brings experience in managing, reporting and analysing large data sets. His current postdoctoral position at the University of Calgary is to evaluate the effectiveness of evidence-based early parenting education and family support programme at CUPS on child mental health and overall well-being of the family.

Carla Ginn (Ph.D. Candidate, Faculty of Nursing, University of Calgary) holds a Master of Science in Nursing and has worked with vulnerable populations throughout her nursing practice. Her Ph.D. dissertation involves a mixed-methods follow-up at age 10 years, the experiences of caregivers whose children completed the programme at CUPS, and those who exited the programme early.

Robert Perry is the Senior Director – Strategic Initiatives at CUPS Health Education and Housing Centres, an inner-city, not-for-profit, registered charitable organisation with a goal of moving individuals and families out of poverty and helping them thrive.

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