Academic and Social Outcomes for High-Risk Youths in Manitoba

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This study examined academic and social outcomes for high-risk youths in Manitoba, using longitudinal, population-based data. All children born in Manitoba in 1984-1985 who resided in Winnipeg the year they turned 18 were included in analyses (N = 11,703). High risk youths were defined as those involved with child welfare services, living in poverty, and/or having a mother who was a teen at first childbirth. Of youths with one risk factor, 41 to 57 per cent failed to complete high school, and 84 per cent of those with all three risk factors did not complete high school, compared with only 18 per cent of youths with none of the risk factors. Multiple risk factors put youths at an even greater disadvantage. Similar poor outcomes for high risk youths were observed for performance in grade 9, unemployment in early adulthood, and teen births. The findings suggest an intractable cycle of risk and disadvantage with far-reaching social and economic implications.

Ces chercheurs ont analysé, à l'aide de données populationnelles longitudinales, les résultats scolaires et sociaux de jeunes à risque élevé au Manitoba. Tous les enfants nés au Manitoba en 1984-1985 et ayant habité à Winnipeg l'année de leurs 18 ans ont été inclus dans leurs analyses (N = 11 703). On entendait par « jeunes à risque élevé » ceux qui ont été bénéficiaires des services d'aide sociale à l'enfance, qui ont vécu dans la pauvreté ou dont la mère était une adolescente lorsqu'elle a donné naissance à son premier enfant. Parmi les jeunes présentant un seul facteur de risque, de 41 à 57 % n'avaient pas terminé leurs études secondaires contre 84 % de ceux qui présentaient les trois facteurs de risque et seulement 18 % de ceux qui n'avaient aucun facteur de risque. Les facteurs de risque multiples placent encore davantage les jeunes dans une situation précaire. Les chercheurs ont noté de piètres résultats scolaires en 9e année, du chômage au début de l'âge adulte et des grossesses précoces chez les jeunes à risque élevé. Ces résultats laissent entrevoir un cycle tenace de risque et de handicaps ayant des implications sociales et économiques d'une grande portée.

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High school completion is an important milestone in an individual's life, a stepping stone for further educational opportunities, training programs, and employment. In an increasingly knowledge-based economy, high school graduation alone, without subsequent training or education, no longer guarantees employment opportunities; however, the lack of a high school diploma remains a significant predictor of negative outcomes, including poverty and unemployment.

Over the past several years, Manitoba has had some success at increasing high school completion rates. By taking the number of students completing grade 12 as a percentage of students enrolled in grade 9 four years earlier, Lowe, Couch, and Perrault (2007) found steadily increasing completion rates, from 70.1 per cent in 2002 to 75.8 per cent in 2006. Furthermore, results from international educational tests indicate that Canadian students do exceptionally well compared with other countries on measures of reading, mathematics, and science, with Manitobans scoring at the Canadian average (Bussière, Cartwright, Knighton, & Rog-

ers, 2004; Willms, 2004). Despite this rather positive outlook for Manitoba students, the research literature suggests that not all students are equally likely to succeed. The present study focuses on students with one or more of three factors that place them at risk of not succeeding in high school: (a) being involved with the child welfare system, (b) living in poverty, and (c) having teen mothers. The research literature, discussed below, suggests that these risk factors may be particularly detrimental to academic and social outcomes. Manitoba's unique collection of population-based, health, and social databases has allowed us to identify all youths residing in Manitoba throughout the study period who had these risk factors, and to track their outcomes over time. Because youths with these risk factors are potentially easily identified by schools, they could, therefore, be targeted for additional resources.

BACKGROUND ON YOUTHS AT RISK

Child Welfare System As a Risk Factor

Geenen and Powers (2006) suggest that although school success is an important factor for all children to achieve positive adult outcomes, it may be even more important for adolescents in care, who often have little else to draw on when transitioning into adulthood out of the foster care system. Educational achievement of children in care has long been a concern (Fanshel & Shinn, 1978) but is often difficult to assess when they move in and out of foster homes and enrol in multiple schools or school districts (Burley & Halpern, 2001). This concern gains more attention as the number of children in care continues to increase (Tweddle, 2007). Adolescents emancipated from the child welfare system often leave with little to no financial resources, community connections, or help from family (Tweddle, 2007), making educational achievement that much more important.

Research indicates that children in foster care are more likely to struggle in school (Blome, 1997; Burley & Halpern, 2001; Goerge, Voorhis, Grant, Casey, & Robinson, 1992; Scherr, 2007). A large proportion of such children (a) receive special education services (Goerge et al., 1992; Zetlin, Weinberg, & Kimm, 2003), (b) have a high rate of absenteeism (Kortenkamp & Ehrle, 2002; Scherr, 2007), (c) are more likely to be suspended or expelled (Kortenkamp & Ehrle, 2002), (d) score 15 to 20 per

cent below their peers on state-wide achievement tests (Burley & Halpern, 2001), (e) are much less likely to graduate (Blome, 1997; Burley & Halpern, 2001), and (f) are likely to repeat at least one grade (Sawyer & Dubowitz, 1994; Burley & Halpern, 2001). Although results of the existing research examining the educational status of children in foster care indicate that these youths constitute a population at serious risk, these studies often focus on small populations and many do not compare children in care with children not in care, making it difficult to estimate the extent of the impact of care status on educational achievement (Burley & Halpern, 2001).

Poverty As a Risk Factor

Family economic resources are also significantly associated with the probability of graduating from high school (Axinn, Duncan, & Thornton, 1997; Duncan & Brooks-Gunn, 1997; Haveman, Wolfe, & Wilson, 1997; Peters & Mullis, 1997; Teachman, Paasch, Day, & Carver, 1997). Children who grow up in poor families are far less likely than other children to complete high school. Children in families living in areas with the lowest socio-economic status have a substantially greater likelihood of school failure than children from families in wealthier neighbourhoods. Children from neighbourhoods with the lowest socio-economic status have been found to be almost eight times more likely to withdraw before completing high school compared with their peers from the highest socio-economic status neighbourhoods (Brownell et al., 2004; Brownell, Roos, Fransoo, Roos, Guèvremont, MacWilliam, Yallop, & Levin, 2006). Furthermore, students in primary grades have a greater likelihood of being retained in grade if they come from areas with lower socio-economic status (Guèvremont, Roos, & Brownell, 2007). Although it has long been recognized that students with lower socio-economic status have poorer educational outcomes, the extent of the differences in outcomes across socio-economic groups was not fully recognized until population-based research highlighted these differences (Brownell et al., 2004; Roos, Brownell, Guèvremont, Fransoo, Levin, MacWilliam, & Roos, 2006).

Family receipt of welfare or income assistance has been used as an indicator of exposure to, and depth of, poverty. Using data mostly from

national surveys or mostly drawing on small samples, researchers have found that adolescents living in families receiving income assistance tend to have lower levels of cognitive achievement and higher levels of behavioural and emotional problems than do adolescents whose mothers had left assistance or had never been on assistance (Chase-Lansdale, Coley, Lohman, & Pittman, 2002). These adolescents have worse academic outcomes (Duncan, Yeung, Brooks-Gunn, & Smith, 1998; Gennetian, Duncan, Knox, Vargas, Clark-Kauffman, & London, 2004), have increased suspensions or expulsions, are more likely to repeat a grade (Morris & Gennetian, 2003), and have less labour market experience (Peters & Mullis, 1997). Others have found that receipt of income assistance had no effect separate from income on educational outcomes (Teachman et al., 1997). Mothers' marital status, education, mental health and physical health status, and parenting practices are some of the other factors to account for the differences in educational outcomes among children in families on income assistance and other children (Chase-Lansdale et al., 2002).

Teen Mothers As a Risk Factor

Although several studies have examined the outcomes for teenage mothers and their children, most studies have focused on perinatal outcomes in children with fewer studies examining later health and development (Shaw, Lawlor, & Najman, 2006). However, researchers have found that children born to teenage mothers (a) tend to have poorer educational outcomes (Levine, Emery, & Pollack, 2007; Moore, Morrison, & Greene, 1995; Shaw et al., 2006), (b) have poorer reading ability and psychological well-being (Moore et al., 1995; Shaw et al., 2006), (c) initiate sexual activity early (Levine et al., 2007; Moore et al., 1995), and (d) are more likely to be in contact with the criminal justice system, smoke regularly, and consume alcohol (Shaw et al., 2006). However, the debate ensues regarding whether it is maternal age, poor socio-economic circumstances, or other family factors that lead to adverse outcomes among these children. A child born to an older mother who had her first child as a teen faces risks similar to those faced by a child born during the mother's teen years (Hoffman, Foster, & Furstenberg, 1993; Jaffee, 2002; Jutte, Roos, Brownell, Briggs, MacWilliam & Roos, 2010; Maynard, 1996).

The goal of the current study was to use population-based data to examine high school completion rates, as well as subsequent social outcomes, for youths with any of these three risk markers: (a) involvement in the child welfare system, (b) family receipt of income assistance, and (c) families where the mother was an adolescent when she had her first child. The literature suggests not only that the presence of risk factors has an impact on child outcomes, but also that the cumulative risk hypothesis predicts that the number of risk factors is equally, if not more, important (Appleyard, Egeland, van Dulmen, & Sroufe, 2005; Burchinal, Roberts, Hooper, & Zeisal, 2000; Deater-Deckard, Dodge, Bates, & Pettit, 1998; Gutman, Sameroff, & Cole, 2003; Pungello, Kainz, Burchinal, Wasik, Sparling, Ramey, & Campbell, 2010; Rouse & Fantuzzo, 2009; Rutter, 1979; Sameroff, Seifer, Baldwin, & Baldwin, 1993; Trentacosta, Hyde, Shaw, Dishion, Gardner, & Wilson, 2008). For this reason we looked not only at these risk factors individually, but in combination with one another to determine their association with educational and social outcomes in adolescence.

METHOD

Population and Data Sources

The present study examined all children born in Manitoba in 1984 and 1985 (N = 14,242), and residing in Winnipeg the year they turned 18 years (N = 11,703). Children dying or moving out of the province prior to this time were excluded from analyses.

Data on the study population came from the Manitoba Population Health Research Data Repository, which contains de-identified, individual-level administrative data on health care, education, and social service contacts for all residents of Manitoba, as well as a registry of all residents eligible for health care services. The registry data include information about family members, including mother's age at the birth of her first child. The education data contain annual information on enrolment of all students in Manitoba, as well as course marks and credits for all high school students (grades 9 through 12). By comparing the population registry (to identify all teens who lived in the province) and enrolment data, it was also possible to determine which students had withdrawn from school (Roos et al., 2006). The social service data includes informa-

tion on all individuals and families receiving provincial income assistance, as well as information on all children taken into the care of Child and Family Services or whose families received protection or support services from Child and Family Services. All data in the Repository are linkable across datasets and over time, using an anonymized identification number. The validity and utility of these datasets have been well documented (Brownell, Mayer, Martens, Kozyrskyj, Fergusson, Bodnarchuk, Derksen, Friesen, & Walld, 2002; Brownell et al., 2006; Oreopoulos, Stabile, Walld, & Roos, 2008; Roos, Gupta, Soodeen, & Jebmani, 2005; Roos, Menec, & Currie, 2004; Roos & Nicol, 1999; Roos, Nicol, & Cageorge, 1987; Roos et al., 2006).

 Using these data, we identified all children with the three risk markers:

1) those who had been taken into care or their family had received services from Child and Family Services[1] at any time when the child was 10 to 17 years (years data were available in the Repository), identified as "CFS";
2) those in families receiving income assistance for two or more months when the child was 10 to 17 years (years data were available in the Repository), identified as "IA";
3) those whose mother was a teen when her first child was born, identified as "teen mom."

Outcome Measures

We determined failure to complete high school by using graduation and course completion records for all study population youths starting at grade 9 in any of the years 1997/1998 to 2001/2002 and still living in Manitoba seven years later. Thus, although high school is usually completed within four years of entering grade 9, we followed youths for seven years to maximize capture of students taking additional years to graduate. Because completion of a full load of courses (eight) by grade-9 students is a predictor of high school success (King, Warren, Boyer, & Chin, 2007), we examined failure to accumulate eight credits in the first year of

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[1]   Children were judged to require care or services from Child and Family Services for reasons such as child abuse or neglect, or when a child was judged to be beyond the control of others.
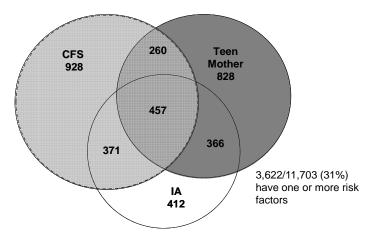
grade 9 as an additional outcome measure. We also examined rates of teen motherhood for adolescent females and receipt of income assistance for all study population youths 18 to 20 years.

Analyses

Logistic regressions were used to compare outcomes for youths with risk factors to those without risk factors. "Risk" was divided into eight categories: (a) no risk, (b) CFS only, (c) IA only, (d) teen mom only, (e) CFS + IA, (f) CFS + teen mom, (g) IA + teen mom, and (h) CFS + IA + teen mom. Regressions were run once with only these risk-marker categories entered into the model, and a second time with additional predictors entered into the model, to determine the impact of the risk factors once additional predictors were controlled for. We chose the additional predictors because the literature suggested these variables were associated with the outcomes, and also based on the availability of these variables in the Repository (Appleyard et al., 2005; Costello, Compton, Keeler, & Angold, 2003; Gutman et al., 2003; Mendelson, 2006b; Oreopoulos et al., 2008; Ouellette-Kuntz, Shooshtari, Temple, Brownell, Burchill, Yu, Holden & Hennen, (2009); Pungello et al., 2010; Roos et al., 2006; Rouse & Fantuzzo, 2009; Rutter, 1979; Sameroff et al., 1993; Zeman, 2007). The additional predictors included (a) sex, (b) age at the start of grade 9 (categorical variable with age measured by half-year intervals), (c) presence of an intellectual disability or emotional/behavioural disorder based on diagnoses from hospital discharge or physician visit records, or special education funding for disabilities at any point in the study period, (d) mother's marital status at the child's birth, (e) number of siblings, (f) area-level per cent of Aboriginal residents, (g) area-level socio-economic status at child's birth, and (h) area-level, socio-economic status at age 14. We determined area-level, socio-economic status by using a composite score based on census information on education levels, unemployment levels, lone-parent status, and female-headed, lone-parent status (Martens, Frohlich, Carriere, Derksen, & Brownell, 2002) available at the dissemination area of residence, and aggregated into four levels (Brownell et al., 2006).

RESULTS

Nearly 14 per cent (1606/11,703) of the children in our study lived in families who had received income assistance at some point while the child was 10 to 17 years old. Just over 16 per cent (1911/11,703) lived in families where the mother was a teen at her first birth. And just over 17 per cent (2016/11,703) had been taken into care or received services from CFS at some point while the child was 10 to 17 years old. Although it may be tempting to assume that most children with these different risk factors have multiple risk factors, Figure 1 shows that there is less overlap between these groups than one might expect. Just under 31 per cent of the youths in the study population (3622/11,703) had at least one risk factor. The majority of youths (2168) had only one risk factor, whereas 997 had two risk factors, and 457 had all three risk factors.

CFS = in care or receiving services from Child and Family Services

IA = family receipt of income assistance

Source: Manitoba Centre for Health Policy, 2008

Figure 1: Overlap of Three Risk Factors for Winnipeg Children

Table 1 provides descriptive results for the four outcomes by the number and type of risk factors. Looking first at the outcome of failing to complete high school, we give in the first column the per cent of youths with none of the three risk factors who did not complete high school within seven years of entering grade 9 (18.1%). The next three columns in the table show the results for youths with one of the risk factors: failure to complete high school was (a) 57.0 per cent for youths in families receiving income assistance, (b) 41.3 per cent for youths with teen mothers, and (c) 42.8 per cent for youths whose families had been involved with the child welfare system. Youths with two of the risk factors faired even more poorly, with the per cent of youths failing to complete high school ranging from 61.5 to 71.7 per cent. Youths with all three risk factors had the poorest outcomes, with fully 84.2 per cent of them failing to complete high school within seven years of grade 9. We found similar results for the per cent of students failing to obtain eight or more credits in grade 9: 16.6 per cent of the students with none of the risk factors failed to obtain eight credits in grade 9, compared to 33.6 to 50.9 per cent of students with only one risk factor, 58.8 to 69.9 per cent of students with two risk factors, and fully 79.8 per cent of the students with all three risk factors. Similarly, the risk of receiving income assistance as a youth was smallest for youths with no risk factors (1.2%) and greatest for youths with all three risk factors (33.5%). Furthermore only 2.1 per cent of the females with none of the risk factors gave birth in their teens compared with 44.5 per cent of the females with all three risk factors.

Prior to running the logistic regressions, we ran a correlation matrix of the variables to be entered into the models and found that the two socio-economic status variables (at birth and at age 14 years) were highly correlated (Pearson correlation coefficient = 0.48). For this reason we did not include them together in the same model, but ran models separately with each of these variables. Because regression results were similar, regardless of which socio-economic status variable was included, we report only on the models with the socio-economic status at age 14 years.

We ran two separate models for each of the outcome measures. Model 1 included only the risk factor variables. Model 2 included the risk factor variables plus the additional predictors. Table 2 shows the

Table 1: Outcomes for youths by number and type of risk factors

Outcome measures	Risk Factors							
	No risk factors	One risk factor			Two risk factors			Three risk factors
		IA	Teen mom	CFS	IA+teen mom	IA+CFS	CFS+teen mom	IA+CFS+teen mom
% Did not Complete High School Within 7 Years of Grade 9 (n)	18.1% (1460)	57.0% (235)	41.3% (342)	42.8% (397)	69.7% (255)	71.7% (266)	61.5% (160)	84.2% (385)
% Did Not Obtain 8+ Credits in first year of high school (n)	16.6% (1306)	50.9% (194)	33.6% (258)	39.6% (347)	65.2% (202)	69.9% (218)	58.8% (143)	79.8% (285)
% Received Income Assistance as a Young Adult (n)	1.2% (94)	17.2% (71)	4.2% (35)	9.0% (84)	26.0% (95)	29.1% (108)	15.4% (40)	33.5% (153)
% Females who Gave Birth in Adolescence (n)	2.1% (83)	20.6% (38)	9.8% (40)	10.7% (52)	31.3% (62)	28.4% (50)	27.1% (32)	44.5% (97)

Table 2: Odds Ratios for Models 1 (Risk factor variable only) and 2 (+ additional predictors), by type and number of risk factors, compared to no risk factors.

Outcome measures	Model[*]	Max. R-Square	Risk Factors						
			One risk factor			Two risk factors			Three risk factors
			IA	Teen mom	CFS	IA+teen mom	IA+CFS	CFS+teen mom	IA+CFS+ teen mom
Did Not Complete High School Within 7 Years of Entering Grade 9	1	0.229	6.02 (4.91,7.38)	3.19 (2.75,3.71)	3.39 (2.94,3.91)	10.47 (8.28,13.11)	11.49 (9.10,14.50)	7.26 (5.62,9.38)	24.25 (18.74,31.39)
	2	0.348	3.95 (3.16,4.95)	2.47 (2.09,2.92)	3.05 (2.62,3.56)	5.41 (4.16,7.03)	6.23 (4.81,8.06)	5.06 (3.83,6.70)	11.05 (8.28,14.74)
Did Not Obtain 8+ Credits after first Year of Grade 9	1	0.200	5.23 (4.24,6.45)	2.55 (2.17,3.00)	3.30 (2.85,3.83)	9.43 (7.41,12.0)	11.69 (9.11,14.99)	7.21 (5.55,9.37)	19.95 (15.30,26.00)
	2	0.276	3.24 (2.58,4.06)	1.99 (1.67,2.37)	2.94 (2.51,3.44)	5.08 (3.89,6.64)	6.55 (5.01,8.56)	4.83 (3.64,6.41)	9.10 (6.80,12.17)
Received Income Assistance as a Young Adult	1	0.285	17.69 (12.8,24.5)	3.75 (2.53,5.57)	8.46 (6.25,11.5)	29.8 (21.9,40.6)	34.9 (25.8,47.2)	15.4 (10.4,22.9)	42.8 (32.3,56.7)
	2	0.393	10.21 (7.09,14.70)	2.50 (1.65,3.79)	5.86 (4.25,8.07)	12.02 (8.34,17.32)	14.07 (9.90,20.0)	7.65 (4.88,11.99)	13.68 (9.62,19.46)

Became a Teen Mother	1	0.267	12.0 (7.90,18.2)	5.00 (3.38,7.41)	5.51 (3.84,7.90)	21.0 (14.5,30.4)	18.3 (12.3,27.1)	17.1 (10.8,27.2)	36.9 (26.2,52.1)
	2	0.314	6.87 (4.38,10.77)	3.55 (2.36,5.36)	4.94 (3.41,7.15)	8.53 (5.57,13.07)	7.93 (5.11,12.30)	11.15 (6.79,18.31)	13.01 (8.58,19.73)

* Model 1 included only the children at risk variable (the 8 risk marker categories with "no risk" as the reference category). Model 2 included children at risk, as well as the following additional predictors: age at Grade 9, presence of intellectual disability or emotional behavioural disorder , number of children in family, area-level SES at age 14 years, area-level percent Aboriginal residents, mother not married at child's birth, and sex.

max-rescaled R² for each of the models for each of the outcomes. The difference in the max-rescaled R² between Model 1 and Model 2 for each outcome indicates that the predictive power of the model was increased by the additional predictor variables, particularly for the outcomes of failure to complete high school and received income assistance as a young adult.

Table 2 also provides the odds ratios for the different levels of the risk factors for each of the outcome measures, and Figures 2 to 5 illustrate the differences for each of the four outcomes for youths with any of the risk factors or combinations of the risk factors compared to youths without the risk markers. We give odds ratios for both Models 1 and 2 in the table, but in the figures only odds ratios for Model 2, which adjusted for additional predictors, are shown. The presence of any of the risk factors greatly increased the odds of failing to complete high school, and the greater the number of risk factors, the greater the increase in the odds of not completing high school. For example, for students with a teen mom, the odds of not completing high school were 3.2 times higher than the odds of a student with no risk factors not completing (row 1, column 5 of Table 2). For students with a teen mom and receiving income assistance, the odds of not completing high school were 10.5 times higher than the odds for a student with none of the risk factors. For students with all three risk factors, the odds of not completing high school within seven years of entering grade 9 were 24.2 times higher than the odds for students with no risk factors. When we controlled for variables like student's age, sex, and presence of a disability (Model 2, row 2, and Figure 2), the odds of not completing high school decreased compared with the models without these variables; however, the odds of not completing high school were still significantly higher for the students with any of the risk factors, compared with those with none of the risk factors (e.g., all three risk factors, OR = 11.05, 95% confidence intervals 8.28, 14.74, Table 2 and Figure 2).

We found statistically significant differences for all outcomes when comparing the odds for youths with any combination of the risk factors to youths with none of the risk factors, even when additional predictors of poor outcomes were adjusted in the models. That is, the odds of not obtaining eight or more credits by the end of the first year in grade 9

were increased for youths with the risk factors, and greater increases were found for multiple risk factors (Table 2, Figure 3). Likewise, the odds of receiving income assistance as a young adult, or becoming an adolescent mother, were significantly increased for youths with the risk factors, and multiple risk factors resulted in greater odds of income assistance receipt or adolescent parenthood (Table 2, Figures 4 and 5).
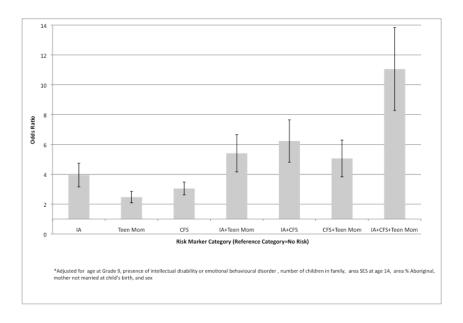

Figure 2: Odds Ratios for Not Completing High School, by Risk Marker Categories Compared to No Risk Markers, Adjusting for Other Important Predictors

Figure 3: Odds Ratios for Not Obtaining 8 or More Credits in First Year Grade 9, by Risk Marker Categories Compared to No Risk Markers, Adjusting for Other Important Predictors
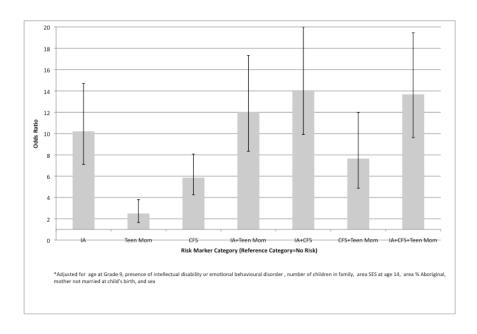
Figure 4: Odds Ratios for Receiving Income Assistance as a Young Adult, by Risk Marker Categories Compared to No Risk Markers, Adjusting for Other Important Predictors
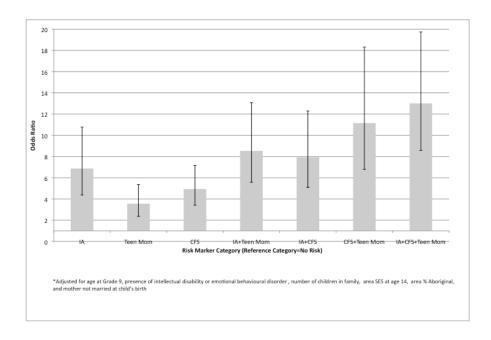
Figure 5: Odds Ratios for Female Becoming Teen Mother, by Risk Marker Categories Compared to No Risk Markers, Adjusting for Other Important Predictors

DISCUSSION

Our results demonstrate that youths with any of the three risk factors on which we focused are at high risk for school failure and subsequent challenges in young adulthood. Each separate risk factor we studied had a significant relationship with the outcomes examined. Youths who have been involved with child welfare, whose families have received income assistance, or whose mothers were teens at the birth of their first child, all were less likely to complete high school compared with youths without these risk factors. We observed this poorer performance as early as grade 9, with youths with any of the risk factors significantly less likely to obtain the required number of credits in their important first year of

high school. Not surprisingly, given the poorer high school completion rates for youths with these risk factors, as young adults they were more likely to receive income assistance themselves, and the females were more likely to become teen mothers, continuing the cycle of risk for their own children. These significantly poorer outcomes persisted for youths with risks, even when we controlled for other predictors of poor outcomes.

We know that not all children have the same abilities, and not all children are going to excel in school. What our results suggest, though, is that for many children, factors beyond individual ability prevent them from maximizing their educational (and developmental) potential. Other research has demonstrated that family background plays a more important role in determining educational outcomes than does early ability, and the importance of family background in contributing to educational success has increased over time (Machin & Vignoles, 2004). The Manitoba Department of Education (Manitoba Education, Training, & Youth, 2002) recognizes that it is "vitally important to focus attention on those who are not succeeding" (p. i). We have demonstrated that for children and youths with the three risk markers examined in the present study, the risks of not succeeding are very high.

Our results also suggest that the *type* of risk has an influence on outcomes. Youths in families receiving income assistance, which is a measure of poverty, appeared to be at a particular disadvantage, when compared with youths with either of the other two risk factors. This difference was particularly evident for high school completion and receipt of income assistance as a young adult. Previous research has also highlighted poverty as a particularly insidious risk factor for poor educational and social outcomes (Arnold & Doctoroff, 2003; Bartholomae, Fox, & McKenry, 2004; Duncan et al., 1998; Farthing, 2010; Furstenberg, 2003; Harper, Marcus, & Moore, 2003).

Although type of risk factor has an impact on outcomes, the number of risk factors is even more important. Confirming the cumulative risk hypothesis, we found that the more risk factors these teenagers had, the greater was their likelihood of poor academic and social outcomes. Indeed, youths with all three risk factors had over 11 times the odds of not completing high school compared with youths with no risk factors, and

over nine times the odds of not obtaining the required number of credits in grade 9. Young adults with all three of our risk factors had 14 times the odds of ending up on income assistance themselves and, for females, 13 times the odds of giving birth during adolescence, even after controlling for additional predictors of these outcomes. Although cumulative risk is clearly detrimental, even just one of these risk factors puts youths at a disadvantage compared with their peers without these risk factors. Fewer youths experience multiple risk factors compared to a single one of the risk markers we examined. Importantly, over one-third of children in Manitoba experience at least one of these risk factors.[2]

As has been demonstrated in other jurisdictions, particularly the United Kingdom (Machin & Vignoles, 2004; Farthing, 2010; Green & Hulme, 2005; Harper et al., 2003) and the United States (Bartholomae et al., 2004; Duncan et al., 1998; Musick & Mare, 2004; Nam, 2004), our findings suggest an intractable cycle of risk and disadvantage for youths at risk. The youths in our study who experienced poverty, adolescent parenting, and/or involvement with child welfare were much less likely to complete high school, factors that will affect their future income and employment opportunities as adults (Ferrer & Riddell, 2002; Ishikawa & Ryan, 2002; Rumberger & Lamb, 2003). Indeed, 84 per cent of youths in our study with all three risk factors failed to complete high school. Even for those with a single risk factor, the failure rate ranged from 41 to 57 per cent. It is widely acknowledged that youths who do not complete high school have greater difficulty transitioning from school to productive activities in adulthood, including further education, training, and employment (Rumberger & Lamb, 2003). With the restricted employment opportunities that those without high school and further education face, the cycles of lower educational attainment and poverty are more likely to continue into subsequent generations (Machin & Vignoles, 2004).

Beyond the high school period, fully one-third of the youths who had experienced all three risk factors in our study received income as-

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2   Our analysis above found that 31 per cent of the children from the 1984 and 1985 birth cohorts had at least one of the three risk factors. Examination of more recent birth cohorts (1995-1999) suggests that 37 to 38 per cent of Manitoba children fall into at least one of these risk categories.

sistance as young adults, a finding in line with research from the United States (Corcoran, 1995; Nam, 2004). Additionally, over 44 per cent of the female youths who had experienced all three risk factors became parents in their teen years, also perpetuating the intergenerational cycle of disadvantage (Breheny & Stephens, 2008; Jutte et al., 2010). The literature suggests that the cycle of disadvantage is the result of broader social structural factors, as opposed to individual choices and deviant family functioning (Breheny & Stephens, 2008; Harper et al., 2003).

Our findings raise a troubling concern regarding the lost potential of youths with risk factors, which affects not only these youths themselves but the future prosperity of the societies in which they live. Not only will these youths themselves be more likely to suffer from personal financial difficulties, but society will suffer because of a loss of potential skilled labour and the associated tax revenue, as well as the social costs, such as unemployment and social assistance, that are associated with low levels of education (Heckman, 2006).

Implications

What can be done to improve outcomes for children faced by social and economic disadvantage? A large research literature has focused on interventions designed to improve outcomes for high risk children, particularly interventions in early childhood. Programs such as (a) the Perry Preschool Program (Schweinhart, Barnes, & Weikart, 1993; Schweinhart, Montie, Xiang, Barnett, Belfield, & Nores, 2005), (b) the Carolina Abecedarian Program (Campbell, Ramey, Pungello, Sparling, & Miller-Johnson, 2002; Ramey & Campbell, 1984), and (c) the Chicago Child-Parent Center program (Reynolds, Ou, & Topitzes, 2004; Reynolds, Temple, Robertson, & Mann, 2002) have demonstrated that intensive preschool programming with disadvantaged children can have long-term positive outcomes. These include (a) increased high school completion and college attendance, (b) decreased teen pregnancies, (c) decreased involvement with the criminal justice system, and (d) increased employment and earnings in adulthood. Recently, Pungello et al. (2010) found that early educational interventions with children exposed to similar risks examined in the current study (teen mothers, family disruption,

poverty) had positive effects on college attendance and obtaining skilled employment in young adulthood.

Although investments in the preschool period may provide the greatest returns in economic benefit-cost analyses, the gains experienced by children involved in these early interventions are more likely to persist if investments continue into the school years (Heckman, 2006). Analyses of over 60 peer-reviewed studies have shown a strong positive relationship between school funding and student performance (Greenwald, Hedges, & Laine, 1996). Currently in Manitoba, educational funding per child is relatively equal across schools (Association of Manitoba Municipalities, 2001) with some extra funding going to schools that have more students from low income families and students in care of CFS, which would include many of our youths at risk (Manitoba Education, Citizenship & Youth, 2006). However, this additional funding is not at the level necessary to provide these high-risk children with what they require to succeed. More research is required to determine what kinds of support children and youths in Manitoba who experience the risk factors examined in the present study are receiving and to evaluate the effectiveness of these supports.

Limitations

There are limitations to our findings worth considering. First, although our regressions adjusted for several potential confounding factors, other important unmeasured variables associated with our three risk factors could have had an influence on the outcomes examined. For example, parental education level, family social support, and family functioning could have had important impacts on outcomes and should be considered in future studies. Second, Manitoba has a relatively high percentage of Aboriginal children, many of whom experience one or more of our three risk factors. In addition, research indicates that Aboriginal youths in Manitoba have lower educational achievement than non-aboriginal Manitobans (Mendelson 2006a; 2006b). Although we attempted to control for Aboriginal status, this information was available only at the area-level through the Canada Census, a fact that may not reflect individual level influences of this variable. The categorized area-level Aboriginal variable did show that each increase in the per cent of Aboriginal youths

was associated with a significant increase in poorer outcomes, suggesting the importance of considering this variable in any analysis of educational outcomes and planning in Manitoba. Future research should endeavour to incorporate individual level information on Aboriginal status. Third, although we controlled for sex in our regression analyses, we made no attempt to examine sex differences in the education outcomes. Findings from the Youth in Transition Survey suggest that sex differences in high school completion in Manitoba are not as great as those found in other provinces (Zeman, 2007); however it is possible that sex differences for these three groups of high-risk youths may be greater than for the general population of Manitoba students. Sex differences in outcomes among high-risk youths should be considered in future research. Finally, future research should consider using Structural Equation Modelling to tease out some of the complex pathways, including the identification of protective factors that contribute to academic and social successes and failures for high-risk youths.

SUMMARY AND CONCLUSION

The present study used longitudinal, population-based data to examine the school performance and social outcomes of high-risk youths with three risk markers: involvement with child welfare, family receipt of income assistance, and living in families whose mothers were teens when they first gave birth. We found that poor performance in high school, as measured by failure to complete a full course load in grade 9 and failure to complete high school within seven years of entering grade 9, was much more likely for youths with any of the three risk factors, and performance decreased with each additional risk factor. Youths with the risk factors were also more likely to receive income assistance as young adults, and become teen mothers themselves, and once again, the more risk factors a youth had, the more likely they were to experience these outcomes. Efforts to break the cycle of risk and disadvantage are needed not only to improve the outcomes for individual children and youths in Manitoba, and elsewhere in Canada, but to improve the economic future of the province and country by enhancing the skills and competencies of the next generation's labor force.

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