

Poverty, Neighbourhood Antisocial Behaviour and Child Mental Health Problems:  
Findings from the 2014 Ontario Child Health Study

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Word count: 3,389

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## **Abstract**

**Objectives:** To determine if levels of neighbourhood poverty and neighbourhood antisocial behaviour modify associations between household poverty and child and youth mental health problems.

**Methods:** Data come from the 2014 Ontario Child Health Study—a provincially representative survey of 6,537 families with 10,802 4 to 17 year olds. Multivariate multilevel modelling was used to test if neighbourhood poverty and antisocial behaviour interact with household poverty to modify associations with child externalizing and internalizing problems based on parent assessments of children (4 to 17 year olds) and self-assessments of youth (12 to 17 year olds).

**Results:** Based on parent assessments, neighbourhood poverty and antisocial behaviour modified associations between household poverty and child mental health problems. Among children living in households below the poverty line, levels of mental health problems were: (1) lower when living in neighbourhoods with higher concentrations of poverty and (2) higher when living in neighbourhoods with more antisocial behaviour. These associations were stronger for externalizing versus internalizing problems when conditional on antisocial behaviour and generalized only to youth-assessed externalizing problems.

**Conclusion:** The lower levels of externalizing problems reported among children living in poor households in low income neighbourhoods identifies potential challenges with integrating poorer households into more affluent neighbourhoods. More importantly, children living in poor households located in neighbourhoods exhibiting more antisocial behaviour are at dramatically higher risk for mental health problems. Reducing levels of neighbourhood antisocial behaviour could have large mental health benefits, particularly among poor children.

(Abstract 240 words)

**Keywords:** Child, Youth, Mental Disorder, Ontario, Neighbourhood effects, Poverty, Antisocial Behaviour

## Introduction

Levels of child (4 to 17 year olds) and youth (12 to 17 year olds) mental health problems are high in Ontario<sup>1</sup> and have increased among 4 to 11 year olds from 30 years ago<sup>2</sup> reflecting secular trends observed in many countries.<sup>3,4</sup> The resources available to identify and treat children with mental health problems case-by-case are too limited to alter child mental health in the general population. Prevention initiatives aimed at all children (universal programs) or groups of children at elevated risk for mental health problems (targeted programs) complement treatment efforts by attempting to reduce the number of children in need of specialized services.<sup>5</sup> Preventing the adverse health effects of exposure to poverty on children depends on identifying variables associated with individual children, their families or neighbourhoods which can be manipulated to maintain or improve child health.

The positive association between poverty and child mental health problems is highly variable, with odds ratios ranging from 1.18 to 3.34.<sup>6</sup> In the 2014 Ontario Child Health Study (OCHS), the association between household poverty and one or more mental disorders was weak,<sup>1</sup> reflecting a possible attenuation of the poverty gradient between the 1983 and 2014 OCHS.<sup>2</sup> This led us to examine if the relationship between household poverty and child mental health problems might be modified in the presence of 2 neighbourhood variables—neighbourhood poverty and antisocial behaviour. The hypothesis is that the disadvantages associated with these 2 neighbourhood characteristics will interact with the psychosocial vulnerabilities associated with household poverty to modify its association with child mental health problems. The hypotheses linking these neighbourhood characteristics with household poverty are situated in stress-process theory<sup>7</sup> and the recognition that neighbourhoods provide important contexts for how the stress process unfolds.<sup>8</sup>

### Neighbourhood Poverty

The joint effects of neighbourhood and household poverty are subject to debate. Theories of relative disadvantage<sup>9,10</sup> predict that living alongside more affluent neighbours will have adverse effects on the health and functioning of children in poor households through psychosocial pathways (e.g., unfavourable social comparisons, threats to self-esteem and social status, marginalization, inability to compete for resources). These adverse effects, attributable to income inequality in neighbourhoods, have been identified recently in boys<sup>11</sup> and boys and girls.<sup>12</sup>

Theories of compound disadvantage<sup>9</sup> predict that the absence of social networks and institutional resources associated with poor neighbourhoods<sup>13</sup> will magnify the disadvantages for children living in poor households. This prediction is supported historically by studies in Europe and North America and is responsible for policies and programs aimed at increasing neighbourhood socio-economic heterogeneity or “social mix”.<sup>14</sup> A singular influence on these policies and programs has been Wilson’s 1987 book, *The Truly Disadvantaged*.<sup>15</sup> Wilson raised concern about compound disadvantage associated with selected housing projects and neighbourhoods in the US that were characterized by intense poverty, inadequate housing, criminality, social isolation and the absence of institutional resources. In the general population, this portrait of disadvantage will apply to some but not all neighbourhoods characterized as economically poor. This leaves open questions about the effects of relative versus compound disadvantage when household and neighbourhood poverty are examined in the general population.

### Neighbourhood Antisocial Behaviour

Neighbourhood poverty is associated with a number of other neighbourhood

characteristics linked with child mental health problems, including ethnic heterogeneity, residential instability and violence.<sup>16-18</sup> Based on available evidence, it is arguable that the personal experience of household members with neighbourhood antisocial behaviour (e.g., being subject to personal insult, violence or theft) or simply living in neighbourhoods with high levels of antisocial behaviour could be a potent variable in the mix of neighbourhood influences on children's mental health.<sup>19</sup> Exposure to neighbourhood antisocial behaviour could have: 1) indirect effects on child mental health mediated through maladaptive parent and family processes;<sup>20</sup> 2) direct adverse effects on child mental health induced by fear, stress and enduring concerns for safety;<sup>21</sup> or 3) create a normative behavioural context that contributes to maladaptive social learning and affiliation with deviant peers.<sup>20</sup>

A number of studies have examined the moderating effects of neighbourhood characteristics on associations between family variables and child mental health. Few, if any, have considered the interaction between neighbourhood antisocial behaviour and household poverty.<sup>22</sup> Two studies reported that neighbourhood adversity (physical/social disorder, fear of retaliation/victimization, dangerousness) intensified the positive association between family adversity (multiple social/economic characteristics) and child emotional and behavioural problems.<sup>23,24</sup> The implications were that levels of neighbourhood antisocial behaviour could modify the association between household poverty and child mental health problems.

Indicators of socio-economic disadvantage are believed to exhibit general rather than specific associations with different child psychiatric disorders.<sup>25</sup> Although it is rare for studies to conduct formal empirical tests of these differences, a recent investigation reported stronger associations between poverty and externalizing versus internalizing problems.<sup>26</sup> This led us to predict that interactions between household poverty and the 2 neighbourhood variables being studied will be stronger for externalizing versus internalizing problems. Evidence of substantial disagreement among informant assessments of child mental health problems<sup>27</sup> led us to test if the results based on parent assessments extended to youth assessments. Although there is no convincing theoretical or empirical basis to expect differential effects for boys versus girls, we conducted post-hoc tests because it is an important question.

The objectives of this study were to determine if neighbourhood poverty and antisocial behaviour modify associations between household poverty and child mental health problems. The study addresses three questions: Q1) Do neighbourhood poverty and antisocial behaviour modify associations between household poverty and child externalizing or internalizing problems? Q2) Are the observed interactions stronger for externalizing versus internalizing problems? and Q3) Are the results for parent-rated externalizing and internalizing problems of children generalizable to youth ratings?

## **Methods**

The 2014 OCHS was a province-wide, cross-sectional, epidemiologic study of child health and mental disorder. A probability sample of 6,537 households (50.8% response) with 10,802 4 to 17 year olds participated. The sampling frame was the 2014 Canadian Child Tax Benefit file. Households were selected based on a complex 3-stage survey design that involved cluster sampling of residential areas and stratification by residency (urban, rural) and income (areas and households cross-classified by 3 levels of income (<20<sup>th</sup>, 20<sup>th</sup> to 80<sup>th</sup>, >80<sup>th</sup> percentiles). Detailed accounts of the survey design, content, training and data collection are available elsewhere.<sup>28,29</sup>

### **Concepts and Measures**

#### *EXTERNALIZING AND INTERNALIZING PROBLEMS*

The dependent variables were dimensional measures of child mental health problems defined as externalizing and internalizing problems assessed by the person most knowledgeable (PMK) (87% mothers) and youth aged 12 to 17 years completing the *OCHS Emotional Behavioural Scales (OCHS-EBS)*. The *OCHS-EBS* are dimensional measures of selected DSM-5 disorders which we grouped to measure externalizing problems (attention-deficit hyperactivity disorder, oppositional-defiant disorder, and conduct disorder—25 items) and internalizing problems (major depressive disorder, generalized anxiety disorder, separation anxiety disorder, and social anxiety disorder—27 items). The *OCHS-EBS* were presented in a self-administered checklist questionnaire with response options of ‘0 = never or not true’, ‘1 = sometimes or somewhat true’ and ‘2 = often or very true’. Items were summed to generate scale scores. The internal consistency and test-retest reliabilities of the scales exceed 0.80 for the externalizing and internalizing scales completed by the PMK or youth. Detailed information on the evolution, development and psychometric properties of the scales are available.<sup>30,31</sup>

#### *CONTROL VARIABLES*

Household information was collected from the PMK based on standard questions developed by Statistics Canada for the Census and population surveys. At the child and family levels, the variables include: child age in years, sex (0 = female; 1 = male), residency (0 = large urban; 1 = small-medium urban or rural), years living in the neighbourhood, highest level of education attained by either parent (grouped from 1 = grade 8 or lower to 9 = university degree above the Bachelor level) and treated as a continuous measure, and family immigrant status (0 = parent(s) born in Canada; 1 = one or both parents born outside Canada). Neighbourhoods are represented by census tracts or dissemination areas. Percentage of individuals born outside of Canada was measured based on the 2011 Census.

#### *POVERTY*

Household poverty was measured as household income below the low-income measure (LIM) (0 =>LIM; 1 =<=LIM); and neighbourhood poverty, as the percentage of households below the LIM based on the 2011 Census.

#### *ANTISOCIAL BEHAVIOUR*

Antisocial behaviour is a cumulative risk variable represented by a count of positive responses provided by the PMK to 4 questions. The questions all begin with: “*While you have lived in this neighbourhood...*”; they ask about the personal experience of any household member to: 1) assault, 2) repeated verbal insult or disrespect, 3) theft from household property or 4) household break-in. PMKs were able to check “not applicable” to these questions which we treated as missing: 0 missing (81.3%), 1 (10.0%), 2 (1.5%), 3 (0.6%) and 4 (6.7%). If at least one item was checked, the remaining items were imputed based on the non-missing antisocial items and 10 other Census-derived and study variables (e.g., Census: large urban, small urban, rural; Interviewer: neighbourhood problems; PMK ratings: neighbourhood safety for children). Positive responses were summed to form a count from 0 to 4. Test-retest reliability was  $r = 0.72$ . To obtain a neighbourhood measure of antisocial behaviour, the PMK scale scores were aggregated to the neighbourhood level and averaged.

#### *Analysis*

Data were analyzed using multivariate multilevel regression in which variability in each outcome is explained by an overall average (intercept); a set of predictor variables (fixed effects); and 3 residual terms (random effects). The residual term quantify unexplained variation between-children within families (level 1), between families within neighbourhoods (level 2) and between-neighbourhoods (level 3). Statistics Canada sampling weights based on the probability of being selected and participating in the study were applied separately to children (level 1) to

represent the probability of each child being selected within a specific household; and to households (level 2) to represent the joint probability of each household and area being selected. The regression models in the analyses were estimated using full information maximum likelihood (FIML) with robust standard errors, in MPlus 7.032.<sup>33</sup> FIML estimates parameters on the basis of the available complete data as well as the implied values of the missing data given the observed data. Study participants with one or more missed responses (1,043 of 10,802 parents and 676 of 4,428 youth) versus complete responses differed on residency in urban areas (8.6 versus 5.8%), household poverty (9.6 versus 5.9%) and exposure to neighbourhood antisocial behaviour (0.28 versus 0.49). To evaluate the impact of missed responses, comparator models were implemented based on complete case analysis for parent ( $n = 9,759$ ) and youth ( $n = 3,752$ ) assessed problems.

The following variables were grand-mean centred (re-scaled so their mean values were 0.0): child age in years, parental education, household member's experience of neighbourhood antisocial behaviour, neighbourhood poverty, percentage of individuals born outside Canada, and average levels of neighbourhood antisocial behaviour. Centering facilitated the interpretation of main effects that comprise the interaction terms and the intercept.

To answer Q1, we tested for cross-level interactions between household poverty, neighbourhood poverty and average levels of neighbourhood antisocial behaviour. The model included the control variables as well as household poverty, household member's experience of neighbourhood antisocial behaviour, neighbourhood poverty and average levels of neighbourhood antisocial behaviour. To answer Q2, we used the Wald  $\chi^2$  to test for statistically significant differences in the cross-level interactions involving child externalizing and internalizing problems. To answer Q3, we repeated the analyses for youth ratings of externalizing and internalizing problems. Because specific hypotheses are being tested in the analyses, nominal P-values are not vulnerable to inflation by multiple testing.

## Results

Table 1 shows the sample characteristics. There are several large, statistically significant differences between families in households below and above the LIM. For example, in households below the LIM there were: higher levels of parent reported externalizing problems (6.4 versus 5.5), lower levels of parental education (6.0 versus 7.0) and a higher percentage of immigrant families (58.2 versus 41.7%). As expected, a higher percentage of households below the LIM were located in areas with higher percentages of other households below the LIM (17.0 versus 12.3).

[insert Table 1.]

Table 2 shows the multivariate multilevel model results for parent and youth-assessed externalizing and internalizing problems. Household member's experience of neighbourhood antisocial behaviour exhibits strong, statistically significant associations with parent-assessed

[insert Table 2.]

externalizing (1.17) and internalizing (0.84) problems. The main effect associations between households below the LIM and externalizing (0.86) and internalizing (0.88) problems do not reach statistical significance ( $0.05 < P < 0.10$ ). However, this variable is involved in significant cross-level interactions. Levels of externalizing (-0.66) and internalizing (-0.54) problems are lower among children living in households below the LIM located in neighbourhoods with higher rates of poverty. At the same time, levels of externalizing (2.09) problems are higher among children living in households below the LIM located in neighbourhoods with elevated levels of

antisocial behaviour. At the neighbourhood level, neighbourhood poverty exhibits positive, statistically significant associations with externalizing (0.35) and internalizing (0.34) problems. Because household poverty is controlled in the model, these coefficients apply to children living in households above the LIM. Accordingly, levels of externalizing and internalizing problems among children in more affluent households are higher when residing in poorer neighbourhoods. These interactions are illustrated for externalizing behaviour in the Figure and address Q1.

[insert Figure.]

In Table 2, the strength of association between household member's experience of neighbourhood antisocial behaviour and parent-assessed child mental health problems is stronger for externalizing (1.17) versus internalizing (0.84) problems as is the cross-level interaction between household poverty and neighbourhood levels of antisocial behaviour (2.09 versus 1.32), addressing Q2.

The results associated with parent-assessments in Table 2 are replicated partially for youth-assessed externalizing problems, addressing Q3. The association between household member's exposure to neighbourhood antisocial behaviour is statistically significant and stronger for youth-assessed externalizing (0.65) versus internalizing (0.32) problems. The cross-level interaction involving households below the LIM, neighbourhood exposure to antisocial behaviour and youth externalizing (1.78) problems is consistent with the parent. Post-hoc statistical tests revealed no male-female differences in the cross-level interactions involving household poverty and the 2 neighbourhood variables.

Using complete case analysis would have produced similar results. This is illustrated by the cross-level interactions reported at the bottom of Table 2. In general, the coefficients and their standard errors for complete case analysis were slightly larger than the estimates generated using FIML. The difference was large enough in the complete case analysis to render significant the cross-level interaction between household poverty, neighbourhood antisocial behaviour and parent reported internalizing problems (1.75).

## Discussion

This study indicates that neighbourhood poverty and neighbourhood antisocial behaviour modify the associations between household poverty and child externalizing problems—an effect that generalizes to youth self-assessments. However, these effects run in opposite directions. In neighbourhoods with higher concentrations of poverty, children living in households below the LIM exhibit lower levels of child mental health problems while children living in households above the LIM exhibit higher levels of mental health problems. Consistent with theories of relative disadvantage, this pattern of response indicates generally that person-context fit may have mental health implications for children in households classified below **or** above the LIM. These findings align with Wilkinson's theory that income inequality or relative income differences among people contribute to negative psychosocial processes adversely affecting everyone, not just those experiencing income disadvantage.

In contrast, the main effect for household member's experience of neighbourhood antisocial behaviour exhibits a strong statistically significant positive association with child externalizing problems, indicating that externalizing problems are elevated among all children exposed to neighbourhood antisocial behaviour. Moreover, the cross-level interaction between neighbourhood antisocial behaviour and household poverty indicates that children living in households below the LIM exhibit substantially higher levels of externalizing problems in the presence of high levels of neighbourhood antisocial behaviour.

## Income Poverty and Person-Context Fit

Since the 1970s, housing policies in Canada have attempted to address the adverse effects of poverty by providing lower income families with the opportunity to live in communities with households of greater economic means.<sup>34</sup> Such communities are expected to provide positive role models, supportive networks, safe environments and institutional resources that will benefit new residents with less income. Our study, consistent with recent reports,<sup>11,12</sup> suggests that socio-economic mix may have adverse effects on the mental health of children from both poor and non-poor families. In other words, children in poor households are at lower risk living in poorer neighbourhoods (or higher risk living in more affluent neighbourhoods) while the reverse is true for children in more affluent households. Achieving the benefits of socio-economic mix may require additional strategies aimed at social integration to overcome differences in the attitudes, behaviour and personal resources of families with different economic backgrounds.

The advantages and challenges of person-context fit are not restricted to the income characteristics of residents. For example, the psychosocial advantages associated with good person-context fit is a lesson well-learned from studies of neighbourhood settlement practices among immigrants to Canada.<sup>35</sup> Levels of mental health problems among immigrant children decrease as the neighbourhood immigrant concentration increases, in contrast to non-immigrant children whose levels of mental health problems increase. In Canada, little is known empirically about the precise social mechanisms underlying good person-context fit and the types of interventions that support healthy adjustment and acceptance in communities. Furthermore, there may be optimal levels of social mix or thresholds in the composition of neighbourhoods (e.g., the percent concentration of immigrant families or families with high or low income) where positive social engagement gives way to forces of social segregation. We need to address these important research questions if the ideals of socio-economic mix are to be realized.

## Income Poverty and Neighbourhood Levels of Antisocial Behaviour

Household exposure to concentrated poverty is substantially lower in Canada compared to the US because of less income segregation, lower crime intensity, and the increased presence of poor but high functioning immigrants.<sup>36</sup> As a result, neighbourhoods characterized as poor vary substantially in their ability to support healthy development. However, as indicated in our study, there are specific neighbourhood variables that can modify associations between household poverty and child mental health. Neighbourhood antisocial behaviour is one such variable. In neighbourhoods characterized by high levels of antisocial behaviour, there is a very large extra burden for children in households classified as poor as these children are also at much higher risk for externalizing problems.

Our measure of antisocial behaviour includes indicators of criminal behaviour (assault) and incivility (verbal insult). Personal safety and security are basic human needs which can be met through a variety of initiatives and programs. For example, the City of Toronto, concerned in 2005 about the negative impact of increasing income segregation and concentrated disadvantage in neighbourhoods, published a policy document called Toronto 2020.<sup>37</sup> Included among the many strategies to address these concerns is a commitment to, “Make our neighbourhoods safer”. If we want to improve the mental health of children, our study suggests that reducing antisocial behaviour in neighbourhoods should be extremely high on the policy agenda, particularly those living in households below the poverty line.

There are two primary limitations of this study: one, the cross-sectional design which provides no perspective on the temporal relationships among the variables investigated and two, the self-selection of families into neighbourhoods. The latter has triggered substantial debate



over the correct way to distinguish between contextual and compositional effects.<sup>38</sup> We have taken the view that children are born without choice into “inceptive environments”<sup>39</sup> which are family and neighbourhood contexts that often persist over the early life-course and may modify each other in ways supportive or unsupportive to child mental health. The strength of this study lies in its large scale use of cluster sampling to facilitate the examination of contextual influences and the stratification of neighbourhoods and households by income to better represent income heterogeneity among families and neighbourhoods in the population.

## **Conclusion**

The study has shown that externalizing behaviour problems are lower among children living in neighbourhoods where family incomes are similar. This suggests some mental health benefits associated with good person-context fit. We also found that exposure of household members to antisocial behaviour is associated strongly with child mental health problems, irrespective of household income. However, there is a very large extra mental health burden for children in households classified as poor when located in neighbourhoods with high levels of antisocial behaviour. Reducing exposure to anti-social behaviour in neighbourhoods is important for all children and could yield special benefits for children living in households below the poverty line.

**Data Access.** Data access available through Statistics Canada Research Data Centres.

**Acknowledgements.** The authors would like to acknowledge Dr. James Carpenter and Dr. Paul Allison for advice regarding handling missing data, and Nancy Pyette for technical assistance with editing and proofreading the manuscript.

**Conflict of Interest Disclosure.** The primary authors (MB, KG, LD, LW and JC) declared no potential conflicts of interest with respect to the research, authorship, and/or publication of this article.

**Funding.** This study was funded by research operating grant 125941 from the Canadian Institutes of Health Research (CIHR), Health Services Research Grant 8-42298 from the Ontario Ministry of Health and Long-Term Care (MOHLTC) and from funding from MOHLTC, the Ontario Ministry of Children and Youth Services and the Ontario Ministry of Education. Dr. Boyle was supported by CIHR Canada Research Chair in the Social Determinants of Child Health and Dr. Georgiades by the David R. (Dan) Offord Chair in Child Studies.

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Table 1. Sample characteristics

Characteristic	<i>n</i>	Families in households above the LIM	Families in households below the LIM	Total	<i>F</i> statistic ( <i>P</i> value)
<b>Children/Youth</b>					
Male, % (SE)	10,802	51.4 (1.03)	51.7 (1.39)	51.3 (0.87)	0.02 (0.882)
Age in years, mean (SE)	10,802	10.7 (0.08)	10.5 (0.11)	10.6 (0.07)	1.94 (0.164)
Parent report: Externalizing problems, mean (SE)	10,643	5.5 (0.12)	6.4 (0.19)	5.6 (0.11)	15.6 (<0.001)
Parent report: Internalizing problems, mean (SE)	10,614	5.7 (0.14)	6.2 (0.20)	5.7 (0.11)	4.66 (0.031)
Youth report: Externalizing problems, mean (SE)	3,981	6.8 (0.19)	6.9 (0.27)	6.8 (0.16)	0.05 (0.819)
Youth report: Internalizing problems, mean (SE)	3,972	11.3 (0.33)	10.7 (0.42)	11.1 (0.28)	1.25 (0.263)
<b>Households</b>					
Children, mean (SE)	6,537	1.6 (0.02)	1.7 (0.03)	1.6 (0.01)	14.43 (0.001)
Households below LIM, % (SE)	6,386			17.6 (0.65)	
Highest level of parent education, mean (SE)	6,264	7.0 (0.04)	6.0 (0.07)	6.8 (0.04)	134.7 (<0.001)
One or both parents born outside Canada, % (SE)	6,371	41.7 (1.29)	58.2 (1.81)	44.6 (1.11)	53.1 (<0.001)
Household exposure to antisocial behaviour, mean (SE)	6,537	0.44 (0.02)	0.48 (0.03)	0.44 (0.02)	1.31 (0.252)
Years living in neighbourhood, mean (SE)	6,537	10.1 (0.20)	8.3 (0.31)	9.8 (0.17)	22.8 (<0.001)
<b>Neighbourhood Areas</b>					
Households below LIM, % (SE)	484	12.3(0.01)	17.0 (0.02)	13.3 (0.01)	206.04 (<0.001)
Small-medium urban or rural residency, % (SE)	484	30.3 (0.04)	22.4 (0.09)	28.6 (0.04)	31.83 (<0.001)
Individuals born outside Canada, % (SE)	484	28.3 (0.02)	33.6 (0.05)	29.4 (0.02)	55.65 (<0.001)
Levels of antisocial behaviour, mean (SE)	484	0.48 (0.00)	0.49 (0.00)	0.48 (0.00)	0.68 (0.411)

Table 2. Fixed-Effects and Random-Effects Variance Components for Multivariate Multilevel Models of Parent and Youth Externalizing and Internalizing Problems

	Parent ( $n = 10,802$ )		Youth ( $n = 4,428$ )	
	Externalizing	Internalizing	Externalizing	Internalizing
<b>Fixed effects</b>				
Intercept	5.46 (0.48) *	6.01 (0.54) *D	7.26 (0.62) *	12.94 (1.03) *D
Level 1: Children/Youth				
Male	1.56 (0.15) *	-0.05 (0.15) D	0.43 (0.23)	-3.37 (0.38) *D
Age	-0.07(0.02) *	0.12 (0.02) *D	0.21 (0.07) *	0.26 (0.11) *
Level 2: Households (HHL D)				
Years living in neighbourhood	-0.04 (0.01) *	-0.04 (0.01) *	-0.03 (0.02)	-0.05 (0.03) *
Highest education level	-0.06 (0.06)	0.01 (0.06) D	-0.08 (0.07)	0.10 (0.12) D
One or both parents born outside Canada	-0.95 (0.24) *	-0.77 (0.24) *	-0.80 (0.28) *	-0.95 (0.48) *
HHL D below LIM	0.86 (0.46)	0.88 (0.48)	0.07 (0.48)	-0.23 (0.74)
Exposure to antisocial behaviour	1.17 (0.16) *	0.84 (0.16) *D	0.65 (0.19) *	0.32 (0.28) D
Level 3: Neighbourhoods				
Small-medium urban or rural	0.19 (0.28)	0.12 (0.32)	0.47 (0.41)	-0.02 (0.64)
Percentage of individuals born outside Canada	-0.19 (0.08) *	-0.27 (0.08) *	-0.11 (0.12)	-0.37 (0.18) *
Percentage of HHL Ds below LIM	0.35 (0.14) *	0.34 (0.15) *	0.29 (0.22)	0.28 (0.33)
Levels of antisocial behaviour	-0.09 (0.43)	-0.31 (0.45)	-0.27 (0.55)	-0.02 (0.97)
Cross-level Interactions				
HHL D poverty x neighbourhood poverty	-0.66 (0.21) *	-0.54 (0.20) *	-0.41 (0.24)	-0.24 (0.35)
HHL D poverty x neighbourhood antisocial behaviour	2.09 (0.73) *	1.32 (0.75) D	1.78 (0.76) *	1.82 (1.36)
<b>Random effects</b>				
Level 1 Children/youth	21.67 (1.22) *	21.38 (1.13) *	26.07 (0.88) *	64.04 (1.92) *D
Level 2 Households	13.70 (1.23) *	16.65 (1.30) *D	3.16 (0.63) *	7.57 (1.25) *D
Level 3 Neighbourhoods	1.96 (0.31) *	2.38 (0.44) *	3.46 (0.70) *	9.34 (1.65) *D
AIC	237323.543		108156.287	
Sample-Size Adjusted BIC	237160.748		107992.401	

\* denote coefficients which are significant at  $P < 0.05$

The letter ‘D’ identifies coefficients which differ in their associations with externalizing versus internalizing problems at  $P < 0.05$ .  
 AIC = Akaike information criterion model fit statistic; BIC = Bayesian information criterion model fit statistic

<b>Cross-level Interactions (Complete Case Analysis)</b>	<b>Parent (<math>n = 9,759</math>)</b>		<b>Youth (<math>n = 3752</math>)</b>	
	HHLD poverty x neighbourhood poverty	-0.62 (0.22) *	-0.41 (.21) *	-0.53 (0.28)
HHLD poverty x neighbourhood antisocial behaviour	2.82 (0.78) *	1.75 (0.77) *	2.33 (0.86) *	1.71(1.65)

Figure.

Graph 1 shows the interaction between household poverty, neighbourhood poverty and externalizing problems. Graph 2 shows the interaction between household poverty, levels of neighbourhood antisocial behaviour and externalizing problems

