

Housing Tenure and Youth Trajectories of Mental Health in Canada

Jinette Comeau

King's University College at Western University

Laura Duncan, Katholiki Georgiades, Li Wang, and Michael H. Boyle

McMaster University

ABSTRACT

We take a novel approach to estimating the association between housing tenure and youth mental health by considering stability and change in exposure. We categorize youth from age 10–15 into mutually exclusive groups: always rent or own—stable patterns; intermittently rent, or own—changing patterns. We use growth modeling to compare trajectories of aggression and emotional problems among children in families who always or intermittently rent to their counterparts who always own. We observe initial disparities in problems with aggression at age 10–11 between youth who have always lived in rented vs. owned housing that persist over time, resulting in comparable disparities at age 14–15.

Keywords: housing tenure, housing policy, youth mental health, latent growth models

RÉSUMÉ

Nous adoptons une approche inédite pour mettre en corrélation le mode d'occupation du logement et la santé mentale des jeunes, sous le regard de la stabilité et de la variabilité quant à l'exposition. Nous avons classé les jeunes de 10 à 15 ans dans des groupes mutuellement exclusifs : ceux issus de familles locataires ou propriétaires en permanence—modèles stables; ceux issus de familles locataires ou propriétaires par intermittence—modèles variables. Nous avons recours à la modélisation de la croissance pour comparer les trajectoires propres aux problèmes d'agressivité et aux troubles émotionnels que présentent les enfants issus de familles locataires, en permanence ou par intermittence, par rapport aux enfants provenant de

Jinette Comeau, Department of Sociology, King's University College at Western University and Children's Health Research Institute, Children's Health and Therapeutics, Western University, London, Ontario; Laura Duncan, Offord Centre for Child Studies, Department of Psychiatry & Behavioural Neurosciences, McMaster University, and Department of Health Research Methods, Evidence & Impact, McMaster University, Hamilton, Ontario; Katholiki Georgiades, Offord Centre for Child Studies, Department of Psychiatry & Behavioural Neurosciences, McMaster University, Hamilton, Ontario; Li Wang, Offord Centre for Child Studies, Department of Psychiatry & Behavioural Neurosciences, McMaster University, Hamilton, Ontario; and Michael H. Boyle, Offord Centre for Child Studies, Department of Psychiatry & Behavioural Neurosciences, McMaster University, Hamilton, Ontario.

No potential conflict of interest reported by the authors.

Correspondence concerning this article should be addressed to Dr. Jinette Comeau, Department of Sociology, King's University College at Western University, 266 Epworth Avenue, London, ON N6A 2M3. Email: jcomeau5@uwo.ca

familles propriétaires en permanence. Nous relevons des différences initiales en ce qui concerne les problèmes d'agressivité entre les jeunes de 10 et 11 ans, dont la famille a toujours vécu dans un logement loué, et ceux du même âge ayant toujours habité un logement appartenant à la famille. Comme ces différences persistent dans le temps, des disparités similaires s'observent également chez les jeunes de 14 et 15 ans.

Mots clés : mode d'occupation, politique en matière de logement, santé mentale des jeunes, modèles de croissance latente

Emotional problems such as depression and anxiety and behavioural problems such as aggression are the leading cause of disease burden among children and youth (herein youth) worldwide (Gore et al., 2011). Yet, many youth experiencing mental health problems will not receive specialized mental health services (Waddell, Shepherd, Schwartz, & Barican, 2014), highlighting the need to identify prevention opportunities in the general population. Given that housing is an important social determinant of health (Krieger & Higgins, 2002), this study aims to provide evidence about the extent to which targeting housing policies might be an effective population-based mechanism for preventing mental health problems among disadvantaged youth in Canada.

We focus on housing tenure because of its policy relevance in developed countries (del Pero, Adema, Ferraro, & Frey, 2016), and strong link with the socioeconomic circumstances of families (Statistics Canada, 2011). For many youth, housing tenure will be a stable feature of their lives; they may always live in an owned or rented dwelling. Other youth will experience change in housing tenure; some may move from a rented to owned dwelling, or vice versa, and still others may fluctuate between owned and rented accommodation. Previous studies have not considered the different patterns of stability and change in housing tenure that youth may experience over time. Yet, they may be associated with youth mental health in a way that is distinct from housing tenure measured at one occasion. Indeed, continuous exposure to socioeconomic risk is associated with youth mental health more strongly and for longer periods of time than short-term exposure (Evans, Li, & Whipple, 2013).

LITERATURE REVIEW

Housing Tenure in Canada

Approximately 78% of Canadian families with children own their dwelling (Statistics Canada, 2011). However, the prevalence of families with stable or changing housing tenure over a given period of time has not been examined. While families may purchase a home as an investment and for increased security, the reasons why families move from owning to renting are likely multifaceted. This could involve stressful life events such as a downward income shock that leads to foreclosure; alternatively, it could involve positive changes, such as moving to secure better employment.

Housing Tenure and Youth Mental Health

Although there is a substantial amount of literature that examines the association between housing tenure and youth educational and cognitive outcomes (Newman & Holupka, 2013), these studies are not necessarily generalizable to youth mental health. The socioeconomic circumstances of families that include income, education, and housing appear to exert a much stronger influence on academic achievement than youth mental health (Brooks-Gunn & Duncan, 1997), suggesting that different processes may underlie these associations. Studies that consider youth mental health report mixed findings: five of them report a robust positive association between homeownership and youth mental health (Boyle, 2002; Cairney, 2005; Gagné & Ferrer, 2006; Haurin, Parcel, & Haurin, 2002; Mollborn, Lawrence, James-Hawkins, & Fomby, 2014), whereas two of them report that the association between homeownership and youth mental health is attributable to differences between parents who own vs. rent their homes (Barker & Miller, 2009; Holupka & Newman, 2012).

Limitations in these studies leave unanswered questions about the association between housing tenure and youth mental health. First, studies have been limited by small analytical samples (<300; Barker & Miller, 2009) or samples restricted to low-income and ethnic minority youth living in the United States (Holupka & Newman, 2012). Fundamental differences in income inequality, the distribution of ethnic minorities, and healthcare between Canada and the United States raise questions about the generalizability of their findings. Second, with the exception of Gagné and Ferrer (2006), all of these studies use a composite mental health measure that conflates internalizing and externalizing problems, which may obscure differences in the effects of housing tenure across these different domains of mental health. Third, with the exception of Boyle (2002), all of these studies rely on mental health measures that are based on primary caregiver reports. Levels of agreement between parental and youth assessments of mental health are low (Achenbach, McConaughy, & Howell, 1987) and, given that the mental health of parents may also be influenced by housing tenure (Manturuk, 2012), relying on their assessments may introduce common-methods bias in statistical analyses. To overcome these limitations, we consider two outcomes reported by youth themselves: emotional and aggression problems.

How might housing tenure be associated with youth mental health? While living in a rented dwelling may increase exposure to inadequate housing conditions such as lead, mold, and pests, homeownership is associated with increased residential stability (Barker & Miller, 2009), and improved self-esteem and life satisfaction in parents (Manturuk, 2012) which may extend to their parenting practices. In contrast, purchasing a home may generate a variety of stressors that undermine parental and youth mental health, including financial strain (Leventhal & Newman, 2010) and the risk of mortgage foreclosure (Houle, 2014).

Stable and Changing Patterns of Housing Tenure

The homeownership rate in Canada follows a socioeconomic gradient, with low-income families having a higher likelihood of living in a rented dwelling (Statistics Canada, 2011). Increased income inequality over the last three decades has created strong barriers to upward socioeconomic mobility, making it increasingly probable that youth will be born into socioeconomic circumstances that are resistant to change over time

(Chetty, Hendren, Kline, Saez, & Turner, 2014). Thus, housing tenure status is likely to be a stable feature of youths' lives from birth, overlapping substantially with their family's socioeconomic status.

The association between housing tenure and youth mental health may have been underestimated in previous studies that did not consider stability in their exposure over time. Indeed, repeated exposure to risk may generate chronic stress that overwhelms and depletes the physiological response system of youth to a greater extent than if they are exposed to a single, short-term risk (McEwen, 2000). Although duration of time spent in a rented vs. owned dwelling is conceptually different from stability, defined as persistent exposure, studies suggest that child mental health problems increased proportionately in relation to the length of time lived in a rented dwelling (Haurin et al., 2002; Mollborn et al., 2014).

Few studies have attempted to conceptualize change in housing tenure, which may involve a single transition from renting to owning, or vice versa, or fluctuating between owning and renting. There is currently no empirical evidence that change in housing tenure is associated with youth mental health (Barker & Miller, 2009). Furthermore, the extent to which change in housing tenure is associated with change in youth mental health, and the relative impact of changing vs. stable patterns of housing tenure has never been examined.

In this paper, we take a novel approach to measuring housing tenure by considering patterns of stability and change. In addition, we use growth modeling to compare initial levels, rates of change, and end levels of mental health problems among youth who always or intermittently live in a rented dwelling to their counterparts who always live in an owned dwelling. This approach provides an opportunity to quantify the extent to which patterns of housing tenure are associated with mental health disparities at age 10–11 and, if so, whether or not these initial disparities are accompanied by differences in the rate of change in youth mental health problems until age 14–15, thus indicating whether initial disparities persist, decrease, or increase over this period of time.

Housing Tenure, Youth Mental Health, and Selection Mechanisms

A key challenge to understanding the association between housing tenure and youth mental health is the extent to which it is attributable to differences between families that own vs. rent their home. As detailed more thoroughly below, we control for various socioeconomic, parental, child, dwelling, and neighbourhood characteristics that might confound the association between housing tenure and youth mental health. An important advantage of the latent growth modeling framework is the ability to treat variables as time-invariant (i.e., do not change over time) or time-varying (i.e., change over time). Indeed, characteristics such as family income may change alongside concurrent changes in housing tenure. Treating these characteristics as time-varying covariates provides a robust way of controlling for confounding influences in the context of a latent growth model (Bollen & Curran, 2006).

Current Study

This study has two objectives. First, we categorize youth between the ages of 10–11 and 14–15 into mutually exclusive groups to estimate the proportion exposed to stable (always own or always rent) vs. changing (intermittently rent or own) patterns of housing tenure. Second, we use latent growth models to

compare trajectories of aggression and emotional problems among children who always or intermittently live in a rented dwelling to their counterparts who always live in an owned dwelling.

METHODOLOGY

Sample

Our analyses are based on data from all eight cycles of the Canadian National Longitudinal Survey of Children and Youth (NLSCY; Statistics Canada, 2007), which was accessed from Statistics Canada's Research Data Centre Network. Starting in 1994/95, a nationally representative sample of 22,831 youth aged 0–11 were enlisted using a multi-stage, stratified, probability sample of Canadian dwelling units. Of these youth, 16,903 were randomly selected by Statistics Canada to participate in additional cycles of the NLSCY. Data were collected biennially until 2008/09 from the person most knowledgeable (PMK) and youth.

Variables

Emotional and behavioural problems: Youth between the ages of 10–15 assessed their emotional and behavioural problems on a 3-point scale (0 = never or not true; 1 = sometimes or somewhat true; 2 = often or very true) using items based on DSM-III-R symptom criteria. Factor analysis was used to identify seven items related to depression and anxiety such as “I am unhappy, sad, or depressed” and “I am nervous, high-strung, or tense” and six items related to aggression such as “I get into many fights” and “I am cruel or mean to others.” Items were summed to create a scale ranging from 0–14 for emotional problems ($\alpha = 0.760$) and 0–12 for behavioural problems ($\alpha = 0.738$). The full list of emotional and behavioural items and additional details regarding the validation and psychometric properties of the scales are available (Boyle et al., 1993; Statistics Canada, 2007).

Housing tenure: Housing tenure was assessed at each cycle by asking the PMK to report whether a member of their household owns the dwelling they live in, even if there is a mortgage on it (0 = own; 1 = rent). The “always own” and “always rent” categories consist of families that continuously owned or rented their dwelling when youth were 10–11, 12–13, and 14–15. The “intermittently rent” category represents families that either moved from renting to owning or, vice versa, or moved from renting to owning then back or, vice versa, across the three measurement occasions included in our analyses.

Time-invariant covariates: This consisted of whether or not one or both of the child's parents were born outside of Canada (0 = no; 1 = yes), the PMK's age in years at the birth of the child, child sex (0 = male; 1 = female), and the child's province of residence to control for regional differences in the Canadian housing market. We also constructed a measure of concentrated neighbourhood disadvantage using information from the Census Enumeration areas in which youth lived in 1996, 2001, and 2006 (average family income, percentage of families headed by a female lone-parent, percentage of the population 15 years or older without a high-school diploma, and percentage of the population 15 years and older who were unemployed). These variables were standardized to a mean of 0 and a standard deviation of 1. Neighbourhood disadvantage represents the unweighted average of these variables, with higher scores indicating greater levels of disadvantage. Given that the Canadian Census occurs every five years and youth mental health is assessed over

a 5-year period from age 10–15, most youth have only one neighbourhood disadvantage score, precluding its use as a time-varying variable.

Time-varying covariates: This consisted of family income (reported by the PMK in the year preceding each assessment, imputed by Statistics Canada prior to release of the NLSCY [details available in Statistics Canada, 2007], adjusted for inflation, and recoded in thousands of dollars), PMK depression measured using the Centre for Epidemiologic Studies Depression Scale (Radloff, 1977), rural residency (0 = urban; 1 = rural), number of years at current residence, and household size (number of persons living in the household).

Missing Data

Of the 16,903 youth selected by Statistics Canada for longitudinal follow-up in the NLSCY, we identified 13,535 (80.1%) cases with at least one valid mental health measure when they were 10–11, 12–13, and 14–15 years of age. Of these 13,535 youth, 10,800 (79.8%) participated in all three interviews, 1,986 (14.7%) participated in two interviews, and 749 (5.5%) participated in only one interview. At cycle 1, the 3,368 youth who were not interviewed at least once between the ages of 10–15 differed from the 13,535 who were interviewed in the following ways: mean years lived at current residence (7.69 vs. 8.44), mean neighbourhood disadvantage (.10 vs. -.06), mean family income (64.62 vs. 74.23), and homeownership (58.9% vs. 74.2%). In terms of non-response to specific items, Table 4 near the end of this article presents the number of valid cases for each variable for the full sample and every housing tenure category by youth age. Missing data on aggression and emotional problems ranged from 13.21% to 25.14% for the full sample and 9.26% to 14.20% across the housing tenure categories, whereas missing data on our covariates ranged from 0.33% to 16.45% for the full sample and 0% to 3.14% across the housing tenure categories. Missing data were addressed using Full Information Maximum Likelihood (FIML) which, in the presence of large amounts of missing data, generates less biased standard errors (Graham, Olchowski, & Gilreath, 2007) and is more robust to non-normal distributions on variables (Yuan, Yang-Wallentin, & Bentler, 2012) than multiple imputation.

Analytical Strategy

We used latent growth modeling to compare initial levels, rates of change, and end levels of mental health problems among youth in the always or intermittently rent categories to their counterparts always living in an owned dwelling. In this type of analysis, the intercept can be specified to represent levels of emotional and aggression problems at age 10–11 (initial levels) or 14–15 (end levels). The slope represents the rate of change in emotional and aggression problems from age 10–11 to 14–15 for every unit increase in time, which corresponds to two years, and its value is the same regardless of how the intercept is specified.

Whereas time-invariant covariates were included as predictors of the intercept and slope growth parameters, repeated measures of time-varying covariates were included as contemporaneous predictors of children's mental health outcomes to control for concomitant changes in their family characteristics alongside changes in housing tenure. All covariates were grand-mean centered to facilitate interpretation of the growth parameters.

To account for the complex survey design of the NLSCY, all models were estimated using FIML with robust standard errors in Mplus version 8.3 (Muthén & Muthén, 2019). In addition, standard errors were estimated using a sandwich estimator to account for the clustering of children in families. To ensure the generalizability of our findings to the Canadian population, all models used sampling weights to account for the unequal probability of selection and attrition of respondents over time (Statistics Canada, 2007).

RESULTS

Descriptive Statistics

Table 1 presents information on the distribution of families across the housing tenure patterns, and the socioeconomic, parental, child, dwelling, and neighbourhood characteristics associated with these patterns. The majority of youth (75.34%) continuously live in an owned dwelling between the ages of 10–11 to 14–15. Whereas 12.0% of youth always live in a rented dwelling, 12.67% live in a rented dwelling intermittently.

Between the ages of 10–11 and 14–15, on the characteristics assessed, youth who always live in an owned dwelling are consistently in a more advantageous position compared to youth who always live in a rented dwelling. In general, families in the intermittent category are less advantaged than those who always own their dwelling but more advantaged than those who always rent their dwelling.

Latent Growth Model—Aggression Problems

The final unadjusted and adjusted model specifications for aggression problems are presented in Table 2. Our unadjusted models demonstrate that youth who always (0.363, $p \leq .001$) or intermittently live in a rented dwelling (0.164, $p \leq .05$) report more problems with aggression at age 10–11 compared to youth who always live in an owned dwelling. Although there are no significant differences in their rates of change over time, these initial disparities persist over time, as reflected in the elevated levels of aggression problems at age 14–15 among youth who always (0.432, $p \leq .001$) or intermittently live in a rented dwelling (0.228, $p \leq .01$) compared to youth who always live in an owned dwelling. Controlling for time-invariant and time-varying covariates, the influence of intermittently living in a rented dwelling at age 10–11 and 14–15 is reduced to non-significance. However, youth who always live in a rented dwelling continue to demonstrate elevated levels of aggression problems at age 10–11 (0.232, $p \leq .05$) and 14–15 (0.260, $p \leq .05$) compared to their counterparts who always live in an owned dwelling. Figure 1 illustrates these differential trajectories, highlighting in particular the significant difference in aggression problems at age 10–11 and 14–15 between the always own vs. rent categories along with their corresponding confidence intervals. The residual variances

...continued on page 50

Table 1
Descriptive Characteristics of Youth from Age 10–11 to 14–15 by Housing Tenure Pattern (N = 13,535)

Mental Health Outcomes				Time-Varying Covariates				Time-Invariant Covariates			
Aggression Problems	Emotional Problems	PMK Depression	Family Income	Years at Residence	Household Size	Rural Dwelling, %	Immigrant Family, %	PMK age at birth of child	Neighbourhood Disadvantage		
Always Own (N = 7,967)											
Age 10–11	1.14 (1.71)	3.41 (2.54)	3.64 (4.72)	8.86 (5.85)	4.49 (1.10)	15.4	22.0	29.04 (4.77)	-0.23 (0.52)		
Age 12–13	1.03 (1.66)	3.15 (2.63)	3.55 (4.66)	10.2 (6.21)	4.46 (1.12)	14.6					
Age 14–15	0.99 (1.68)	3.37 (2.80)	3.56 (4.81)	11.47 (6.77)	4.37 (1.11)	15.6					
Always Rent (N = 1,268)											
Age 10–11	1.50 (1.93)	3.84 (2.77)	7.21 (7.09)	4.75 (4.99)	3.85 (1.30)	7.5	24.3	27.23 (5.32)	0.28 (0.65)		
Age 12–13	1.50 (2.13)	3.54 (2.72)	6.71 (7.06)	5.23 (4.86)	3.80 (1.28)	7.7					
Age 14–15	1.40 (2.13)	3.48 (2.91)	6.86 (7.27)	5.82 (5.44)	3.71 (1.23)	6.8					
Intermittently Rent (N = 1,340)											
Age 10–11	1.31 (1.73)	3.45 (2.62)	5.12 (5.84)	5.24 (5.26)	4.19 (1.28)	14.1	21.2	27.12 (5.76)	-0.03 (0.41)		
Age 12–13	1.26 (1.81)	3.61 (2.93)	5.33 (6.0)	5.08 (5.83)	4.08 (1.23)	13.8					
Age 14–15	1.20 (1.86)	3.65 (2.91)	4.93 (5.90)	4.28 (5.58)	3.91 (1.24)	15.4					

Notes. (1) Estimates are means and standard deviations in parentheses unless otherwise noted; (2) PMK=Person Most Knowledgeable; (3) There were 10,575 valid responses on the housing tenure variables which represent exposure from age 10–11 to 14–15.

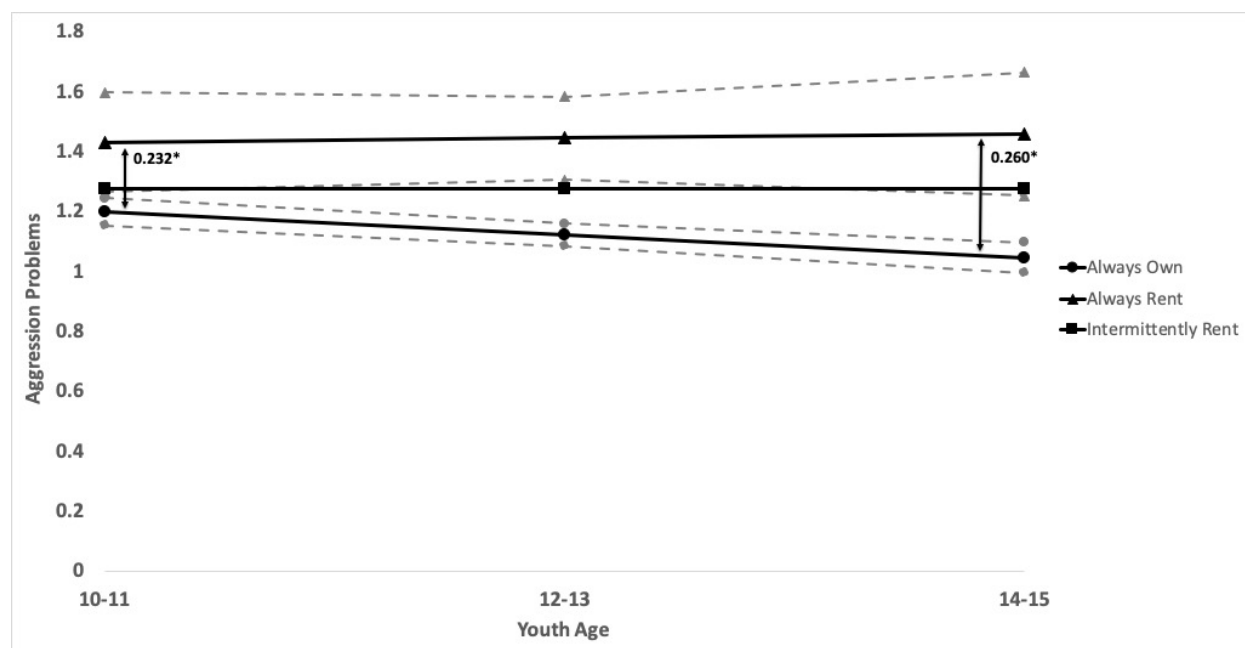
Table 2
Latent Growth Model Estimating Trajectories of Aggression Problems

	Unadjusted Model		Adjusted Model	
	Estimate (S.E.)	95% C.I.	Estimate (S.E.)	95% C.I.
Always Rent				
Intercept at Age 10–11	0.363*** (0.101)	[0.196, 0.529]	0.232* (0.101)	[0.065, 0.398]
Linear Slope	0.017 (0.036)	[-0.041, 0.076]	0.007 (0.038)	[-0.056, 0.070]
Intercept at Age 14–15	0.432*** (0.122)	[0.232, 0.633]	0.260* (0.125)	[0.054, 0.467]
Intermittently Rent				
Intercept at Age 10–11	0.164* (0.081)	[0.031, 0.297]	0.076 (0.079)	[-0.054, 0.206]
Linear Slope	0.016 (0.029)	[-0.031, 0.063]	-0.001 (0.029)	[-0.047, 0.047]
Intercept at Age 14–15	0.228** (0.087)	[0.084, 0.372]	0.077 (0.087)	[-0.066, 0.219]
Time Invariant Covariates				
Child Sex (female)				
Intercept at Age 10–11			-0.768*** (0.046)	[-0.845, -0.692]
Linear Slope			0.062*** (0.016)	[0.035, 0.089]
Intercept at Age 14–15			-0.519*** (0.050)	[-0.601, -0.436]
Immigrant Family				
Intercept at Age 10–11			-0.165 (0.070)	[-0.280, -0.051]
Linear Slope			0.025 (0.024)	[-0.015, 0.066]
Intercept at Age 14–15			-0.064 (0.089)	[-0.210, 0.081]
Neighbourhood Disadvantage				
Intercept at Age 10–11			0.086 (0.047)	[0.009, 0.163]
Linear Slope			-0.004 (0.016)	[-0.031, 0.022]
Intercept at Age 14–15			0.068 (0.052)	[-0.017, 0.153]
PMK age at birth of Child				
Intercept at Age 10–11			-0.010 (0.006)	[-0.019, 0.000]
Linear Slope			-0.003 (0.002)	[-0.006, 0.001]
Intercept at Age 14–15			-0.020*** (0.006)	[-0.030, -0.010]
Time Varying Covariates				
Family Income			-0.001*** (0.000)	[-0.002, -0.001]
Years at Residence			-0.010*** (0.003)	[-0.015, -0.005]
PMK Depression			0.018*** (0.003)	[0.013, 0.023]
Household Size			0.068*** (0.016)	[0.042, 0.094]
Rural Dwelling			0.071 (0.040)	[0.004, 0.137]
Residual Variances				
Intercept at Age 10–11	1.533*** (0.132)	[1.316, 1.750]	1.307*** (0.130)	[1.094, 1.521]
Linear Slope	0.107*** (0.015)	[0.082, 0.132]	0.105*** (0.015)	[0.080, 0.130]
Intercept at Age 14–15	1.865*** (0.148)	[1.622, 2.108]	1.721*** (0.142)	[1.487, 1.955]

* $p \leq .05$; ** $p \leq .01$; *** $p \leq .001$

Notes. (1) PMK = Person Most Knowledgeable; (2) children in the always or intermittently rent categories are compared to those in the always own category; (3) models additionally controlled for province of residence; (4) coefficients are unstandardized.

Figure 1
Trajectories of Aggression Problems by Housing Tenure Pattern



Notes. (1) children in the always or intermittently rent categories are compared to those in the always own category; (2) the difference in aggression problems at age 10–11 and 14–15 between children in the always own vs. rent categories is statistically significant at $*p \leq .05$; (3) the broken lines represent the upper and lower bounds of the 95% confidence intervals around the trajectories of mental health for youth in the always own vs. rent categories; (4) the full aggression problems scale ranges from 0–12, with values above 1.8 omitted to conserve space.

...continued from page 47

at the bottom of Table 2 indicate that there is significant variation in initial levels, rates of change, and end levels of aggression problems in both the unadjusted and adjusted models.

Latent Growth Model—Emotional Problems

Turning to Table 3, our unadjusted models indicate that emotional problems are higher among youth who always live in a rented dwelling at age 10–11 (0.338, $p \leq .01$) and youth who intermittently live in a rented dwelling at age 14–15 (0.371, $p \leq .01$) compared to their counterparts who always live in an owned dwelling. In our adjusted models, these associations are reduced to non-significance. Trajectories of emotional problems are plotted in Figure 2. Despite a pattern indicating that the rate of change (0.065, $p \leq .10$) in emotional problems and levels at age 14–15 (0.267, $p \leq .10$) are somewhat greater among youth who

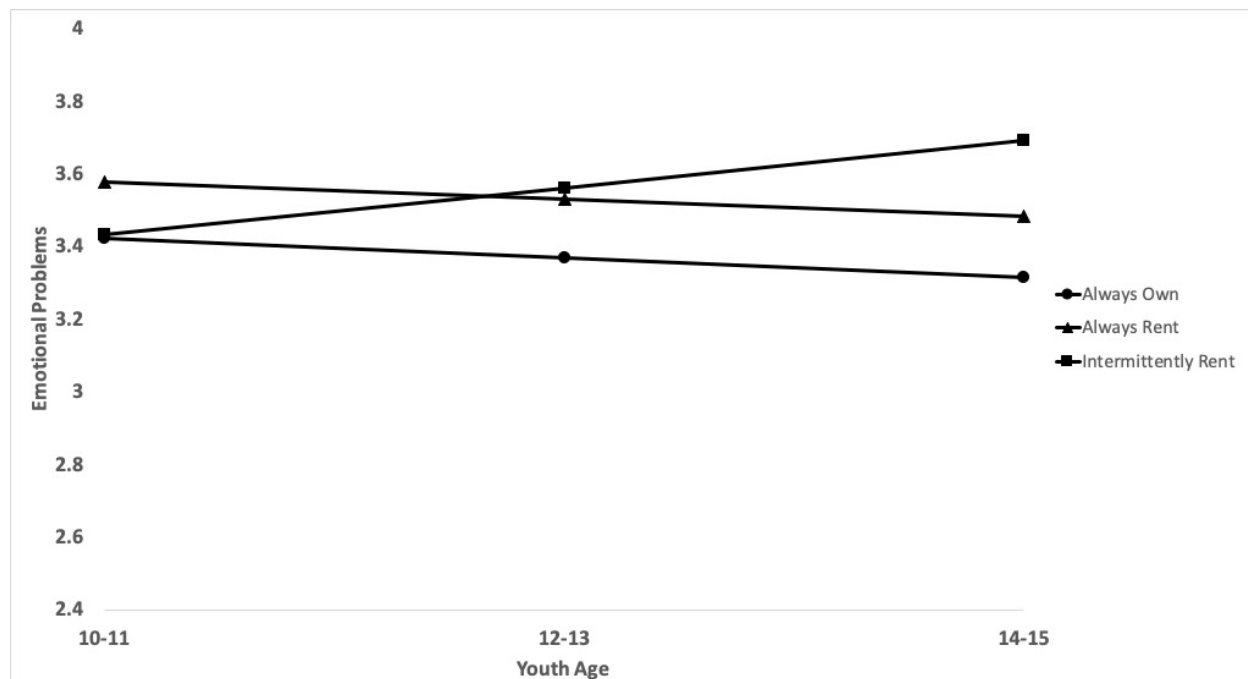
Table 3
Latent Growth Model Estimating Trajectories of Emotional Problems

	Unadjusted Model		Adjusted Model	
	Estimate (S.E.)	95% C.I.	Estimate (S.E.)	95% C.I.
Always rent				
Intercept at age 10–11	0.338** (0.141)	[0.107, 0.570]	0.152 (0.143)	[-0.082, 0.387]
Linear slope	-0.035 (0.045)	[-0.110, 0.039]	-0.023 (0.047)	[-0.101, 0.055]
Intercept at age 14–15	0.197 (0.146)	[-0.044, 0.438]	0.062 (0.149)	[-0.183, 0.306]
Intermittently rent				
Intercept at age 10–11	0.132 (0.118)	[-0.061, 0.326]	0.007 (0.114)	[-0.181, 0.195]
Linear slope	0.060 (0.044)	[-0.012, 0.132]	0.065 (0.043)	[-0.007, 0.137]
Intercept at age 14–15	0.371** (0.153)	[0.120, 0.623]	0.267 (0.149)	[0.022, 0.512]
Time invariant covariates				
Child sex (female)				
Intercept at age 10–11			0.202** (0.070)	[0.087, 0.317]
Linear slope			0.309*** (0.025)	[0.268, 0.351]
Intercept at age 14–15			1.440*** (0.080)	[1.309, 1.571]
Immigrant family				
Intercept at age 10–11			-0.120 (0.102)	[-0.288, 0.047]
Linear slope			0.013 (0.037)	[-0.048, 0.075]
Intercept at age 14–15			-0.067 (0.120)	[-0.265, 0.130]
Neighbourhood disadvantage				
Intercept at age 10–11			0.035 (0.070)	[-0.080, 0.150]
Linear slope			-0.017 (0.026)	[-0.060, 0.026]
Intercept at age 14–15			-0.032 (0.081)	[-0.166, 0.102]
PMK age at birth of child				
Intercept at age 10–11			-0.001 (0.008)	[-0.013, 0.013]
Linear slope			0.002 (0.003)	[-0.003, 0.006]
Intercept at age 14–15			0.006 (0.009)	[-0.010, 0.021]
Time varying covariates				
Family income			-0.002*** (0.000)	[-0.003, -0.001]
Years at residence			-0.010* (0.004)	[-0.017, -0.003]
PMK depression			0.032*** (0.005)	[0.025, 0.040]
Household size			0.061* (0.025)	[0.021, 0.102]
Rural dwelling			-0.035 (0.064)	[-0.140, 0.069]
Residual variances				
Intercept at age 10–11	3.165*** (0.224)	[2.796, 3.534]	3.027*** (0.218)	[2.668, 3.386]
Linear slope	0.264*** (0.030)	[0.215, 0.313]	0.245*** (0.028)	[0.199, 0.292]
Intercept at age 14–15	4.644*** (0.238)	[4.252, 5.036]	4.113*** (0.235)	[3.727, 4.498]

*p ≤ .05; ** p ≤ .01; *** p ≤ .001

Notes. (1) PMK = Person Most Knowledgeable; (2) children in the always or intermittently rent categories are compared to those in the always own category; (3) models additionally controlled for province of residence; (4) coefficients are unstandardized.

Figure 2
Trajectories of Emotional Problems by Housing Tenure Pattern



Notes. (1) children in the always or intermittently rent categories are compared to those in the always own category; (2) the differences between children in the always or intermittently rent and always own categories are not statistically significant at $*p \leq .05$; (3) the full emotional problems scale ranges from 0–14, with values below 2.4 and above 4 omitted to conserve space.

are intermittently exposed to a rented dwelling compared to youth who always live in an owned dwelling, these associations do not reach significance at $p \leq .05$. There continues to be significant variation in initial levels, rates of change, and end levels of emotional problems in both our unadjusted and adjusted models.

DISCUSSION

Stable Patterns of Housing Tenure

Our first objective was to document the different patterns of housing tenure that youth experience between the ages of 10–11 and 14–15. The majority of youth live continuously in an owned dwelling and, compared with their peers in the other housing tenure categories, experience favorable circumstances indicated by their relatively lower levels of neighbourhood disadvantage and parental depression, but higher levels of family income. Whereas 87.34% of youth experienced stable housing tenure (rent or own) from age 10–11 to 14–15, the small residual category (12.67%) of youth who experience change in housing tenure lends credence to the evidence that socioeconomic circumstances as reflected in housing tenure are stable (Glass & Bilal, 2016).

With respect to our second objective, our results demonstrate that youth who always live in a rented dwelling experience significantly higher levels of aggression problems at age 10–11 compared to their counterparts who always live in an owned dwelling and these initial differences persist over time, resulting in comparable disparities at age 14–15. Although disparities in aggression problems from age 10 to 15 between children in the always own vs. rent categories are rather modest, they represent population-level effects and, if these between-group differences were reduced through meaningful housing policies, it could constitute a socially important change.

Our conceptualization of housing tenure as stable or changing and use of growth modeling to examine the association between these patterns of exposure and youth mental health provide several advantages over previous cross-sectional studies. By identifying youth who always live in a rented vs. owned dwelling, we are able to distinguish between those who are most disadvantaged from those who are least disadvantaged with regard to housing tenure. Indeed, a crucial aspect of the experience of disadvantage for many youth is the extent to which it is enduring (Evans et al., 2013), yet no previous studies on housing tenure and youth mental health have taken this into consideration. Our concern is that previous research has underestimated the association of housing tenure and youth mental health, leading to the erroneous conclusion that living in a rented dwelling does not undermine youth mental health, which has important policy implications.

We believe that previous studies that have not considered different domains of youth mental health may have also underestimated its association with housing tenure. Our finding that always living in a rented dwelling is associated with aggression problems but not emotional problems highlights the importance of considering both outcomes separately, which has only been done in one study to date (Gagné & Ferrer, 2006). Given that emotional problems typically emerge later in adolescence (Bongers, Koot, Van der Ende, & Verhulst, 2003) and that we only follow youth to age 15, it is possible that differences in emotional

problems between youth who live in a rented vs. owned dwelling will be observed later in the life course. More research is needed to examine the association between housing tenure and mental health at various child and youth ages.

Changing Patterns of Housing Tenure

Our second objective also involved estimating the association between change in housing tenure and youth trajectories of mental health, which did not reach statistical significance in our adjusted models. Youth exposed to transitions in housing tenure may be subject to more dramatic changes in family characteristics compared with their peers in the other categories. Identifying the reasons for changes in housing tenure may provide a more nuanced examination of the association between housing tenure and youth mental health. For example, if a change in housing tenure is related to financial instability, it is likely to undermine youth mental health. However, if a change improves the circumstances of families, it may enhance youth mental health. Disaggregating these influences poses challenges, especially in the limited time period covered by this study.

Policy Implications

While our results suggest that there may be certain features of rented dwellings or the experience of living in one that undermines youth mental health, successful social policies and interventions will require understanding the specific mechanisms through which living in a rented dwelling undermines youth mental health. For example, rented dwellings are almost twice as likely as owner-occupied dwellings to have structural deficiencies, mold, and vermin, and families living in a rented dwelling are also at risk of unpredictable rent increases and eviction that result in greater residential mobility. These negative characteristics associated with rented dwellings may contribute to negative health outcomes in adults and children (Bachelder, Stewart, Felix, & Sealy, 2016). The inherent power imbalance between tenants and landlords, which may be exacerbated by high rental costs, low-vacancy rates, and weak tenant protection laws, leaves many families without recourse to improve their living conditions and vulnerable to housing insecurity (Krieger & Higgins, 2002).

Most housing policies in Canada are aimed at supporting homeownership, often at the expense of policies that improve the rights and living conditions of low-income families living in rented dwellings that may never have the opportunity to purchase a home. Given that policies focused on support for homeownership typically favour higher income households (del Pero et al., 2016) and actually might exacerbate mental health disparities between youth in families that own vs. rent their dwelling, we believe strategies that aim to make the living conditions and rights of tenants similar to those of homeowners may be more effective

...continued on page 56

Table 4
Number of Valid Cases for Each Variable by Youth Age for the Full Sample and Every Housing Tenure Category

Mental Health Outcomes			Time-Varying Covariates			Time-Invariant Covariates			
Aggression Problems	Emotional Problems	PMK Depression	Family Income	Years at Residence	Household Size	Rural Dwelling, %	Immigrant Family, %	PMK age at birth of child	Neighbourhood Disadvantage
Full Sample (N = 13,535)									
Age 10–11	11,745	11,747	12,720	13,098	12,850	13,098	13,061		
Age 12–13	10,977	10,979	12,004	12,399	12,201	12,399	12,360		
Age 14–15	10,133	10,133	11,308	11,697	11,500	11,697	11,663		
Always Own (N = 7,967)									
Age 10–11	7,226	7,229	7,788	7,967	7,858	7,967	7,950	7,946	7,911
Age 12–13	7,201	7,202	7,761	7,967	7,882	7,967	7,944		
Age 14–15	6,979	6,978	7,771	7,967	7,874	7,967	7,946		
Always Rent (N = 1,268)									
Age 10–11	1,105	1,104	1,244	1,268	1,260	1,268	1,263	1,266	1,258
Age 12–13	1,143	1,431	1,241	1,268	1,255	1,268	1,265		
Age 14–15	1,088	1,088	1,229	1,268	1,262	1,268	1,262		
Intermittently Rent (N = 1,340)									
Age 10–11	1,174	1,175	1,305	1,340	1,318	1,340	1,333	1,336	1,322
Age 12–13	1,180	1,180	1,298	1,340	1,332	1,340	1,330		
Age 14–15	1,150	1,150	1,298	1,340	1,326	1,340	1,335		

Notes. (1) PMK = Person Most Knowledgeable about the child; (2) There were 10,575 valid responses on the housing tenure variables which represent exposure from age 10–11 to 14–15.

in reducing these disparities. This may include developing and enforcing strict building codes for rented dwellings, stronger controls to prevent rent increases and eviction, greater supports to negotiate maintenance issues with landlords to ensure safe and adequate housing conditions, as well as mechanisms in place to deal with discrimination on the part of landlords.

CONCLUSIONS AND LIMITATIONS

We contribute to the literature on housing tenure and youth mental health by (1) using nationally representative longitudinal data from Canada that includes repeated measures of housing tenure and youth mental health problems; (2) assessing stable and changing patterns of housing tenure; (3) using growth modeling to examine the association between these patterns of housing tenure and initial levels, rates of change, and end levels of youth mental health problems; and (4) using mental health measures self-reported by youth, and differentiating between aggression and emotional problems.

There are also important limitations that need to be considered when interpreting our results. Our analyses are limited by the relatively short period of observation used to measure youth mental health (five years), which may be insufficient to detect differences in the mental health trajectories of youth exposed to different patterns of housing tenure. The omission of control variables (e.g., child maltreatment and parental substance abuse) not available in the NLSCY and inability to treat neighbourhood disadvantage as a time-varying variable preclude causal inferences regarding the association between housing tenure and youth mental health. As with all longitudinal studies, sample attrition and differences between families included vs. excluded in our analyses may have biased our results. We use sample weights to adjust for non-response over time and believe differential attrition of youth in the NLSCY may have attenuated, not strengthened, the association between housing tenure and youth mental health because those who left the study were more disadvantaged. The NLSCY's last cycle was in 2008/09, thus limiting the inferences we can make about the association between housing tenure and youth mental health contemporarily and highlighting the need for additional research using more recent data.

REFERENCES

- Achenbach, T. M., McConaughy, S. H., & Howell, C. T. (1987). Child/adolescent behavioral and emotional problems: Implications of cross-informant correlations for situational specificity. *Psychological Bulletin*, 101(2), 213.
- Bachelder, A. E., Stewart, K. M., Felix, H. C., & Sealy, N. (2016). Health complaints associated with poor rental housing conditions in Arkansas: The only state without a landlord's implied warranty of habitability. *Frontiers in Public Health*, 4(263).
- Barker, D., & Miller, E. (2009). Homeownership and child welfare. *Real Estate Economics*, 36(2), 279–303.
- Bongers, I. L., Koot, H. M., Van der Ende, J., & Verhulst, F. C. (2003). The normative development of child and adolescent problem behavior. *Journal of Abnormal Psychology*, 112(2), 179.
- Bollen, K. A., & Curran, P. J. (2006). *Latent curve models: A structural equation perspective*. New Jersey: John Wiley & Sons, Inc.
- Boyle, M. H. (2002). Homeownership and the emotional and behavioral problems of children and youth. *Child Development*, 73(3), 883–892.
- Boyle, M. H., Offord, D. R., Racine, Y., Fleming, J. E., Szatmari, P., & Sanford, M. (1993). Evaluation of the revised Ontario Child Health Study scales. *Journal of Child Psychology and Psychiatry*, 34(2), 189–213.
- Brooks-Gunn, J., & Duncan, G. J. (1997). The effects of poverty on children. *The Future of Children*, 7(2), 55–71.

- Cairney, J. (2005). Housing tenure and psychological well-being during adolescence. *Environment and Behavior*, 37(4), 552–564.
- Chetty, R., Hendren, N., Kline, P., Saez, E., & Turner, N. (2014). Is the United States still a land of opportunity? Recent trends in intergenerational mobility. *The American Economic Review*, 104(5), 141–147.
- del Pero, A. S., Adema, W., Ferraro, V., & Frey, V. (2016). *Policies to promote access to good-quality affordable housing in OECD countries*. OECD Social, Employment and Migration Working Papers, No. 176, OECD Publishing, Paris.
- Evans, G. W., Li, D., & Whipple, S. S. (2013). Cumulative risk and child development. *Psychological Bulletin*, 139(6), 1342.
- Gagné, L. G., & Ferrer, A. (2006). Housing, neighbourhoods, and development outcomes of children in Canada. *Canadian Public Policy*, 32(3), 275–300.
- Glass, T. A., & Bilal, U. (2016). Are neighborhoods causal? Complications arising from the ‘stickiness’ of ZNA. *Social Science and Medicine*, 166, 244–253.
- Gore, F. M., Bloem, P. J., Patton, G. C., Ferguson, J., Joseph, V., Coffey, C., Sawyer, S. M., & Mathers, C. D. (2011). Global burden of disease in young people aged 10–24 years: A systematic analysis. *The Lancet*, 377(9783), 2093–2102.
- Graham, J. W., Olchowski, A. E., & Gilreath, T. D. (2007). How many imputations are really needed? Some practical clarifications of multiple imputation theory. *Prevention Science*, 8, 206–213.
- Haurin, D. R., Parcel, T. L., & Haurin, R. J. (2002). Does homeownership affect child outcomes? *Real Estate Economics*, 30(4), 635–666.
- Holupka, S., & Newman, S. J. (2012). The effects of homeownership on children’s outcomes: Real effects of self-selection? *Real Estate Economics*, 40(3), 566–602.
- Houle, N. H. (2014). Mental health in the foreclosure crisis. *Social Science and Medicine*, 118, 1–8.
- Krieger, J., & Higgins, D. L. (2002). Housing and health: Time again for public health action. *Public Health Matters*, 92(5), 758–768.
- Leventhal, T., & Newman, S. (2010). Housing and child development. *Children and Youth Services Review*, 32(9), 1165–1174.
- Manturuk, K. R. (2012). Urban homeownership and mental health: Mediating effect of perceived sense of control. *City and Community*, 11(4), 409–430.
- McEwen, B. S. (2000). The neurobiology of stress: From serendipity to clinical relevance. *Brain Research*, 886, 172–189.
- Mollborn, S., Lawrence, E., James-Hawkins, L., & Fomby, P. (2014). How resource dynamics explain accumulating developmental and health disparities for teen parents’ children. *Demography*, 51(4), 1199–1224.
- Muthén, L. K., & Muthén, B. O. 1998–2019. *Mplus User’s Guide*. Eighth Edition. Los Angeles, CA: Muthén & Muthén.
- Newman, S. J., & Holupka, C. S. (2013). Looking back to move forward in homeownership research. *Cityscapes*, 15(2), 235–246.
- Radloff, L. S. (1977). The CES-D scale: A self-reported depression scale for research in the general population. *Applied Psychological Measurement*, 1, 385–401.
- Statistics Canada. (2007). Microdata user guide: National Longitudinal Survey of Children and Youth, Cycle 8. Special Surveys Division. Ottawa, ON.
- Statistics Canada. (2011). Homeownership and shelter costs in Canada. National Household Survey. Catalogue no. 99-014-X2011002.
- Waddell, C., Shepherd, C., Schwartz, C., & Barican, J. (2014). *Child and youth mental disorders: Prevalence and evidence-based interventions*. Vancouver, BC: Children’s Health Policy Centre, Simon Fraser University.
- Yuan, K. H., Yang-Wallentin, F., & Bentler, P. M. (2012). ML versus MI for missing data with violation of distribution conditions. *Sociological Methods and Research*, 41(4), 598–629.