Influence of area deprivation and perceived neighbourhood safety on active transport to school among urban Quebec preadolescents

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ABSTRACT

OBJECTIVE: This study examines associations between area deprivation and perceived neighbourhood safety with active transport to school among preadolescents living in urban Quebec.

METHODS: A sample of 809 preadolescents aged 9 to 13 years and one each of their parents living in urban Quebec were recruited by a polling firm for a telephone interview about the *Opération WIXX* multimedia communication campaign. *Opération WIXX* was launched in 2012 by *Québec en forme* to promote physical activity among preadolescents. Logistic regression models predicted active transportation to school (as reported by both the child and his or her parent) from area-level material and social deprivation and from parental and children's perceptions of neighbourhood safety while controlling for socio-demographic variables.

RESULTS: Child and parental reports of active commuting to school were highly concordant (Kendall's tau=0.70, $p<0.001$). Children whose parents felt at ease to let their children actively commute to school (OR=1.75, 95% CI 1.25-2.45; $p=0.001$) and who lived in areas characterized by the highest material (OR=2.02, 95% CI 1.09-3.76; $p=0.026$) and social (OR=3.69, 95% CI 2.12-6.42; $p<0.001$) deprivation were more likely to report actively commuting to school. Parents who felt at ease to let their children actively commute to school (OR=1.60, 95% CI 1.15-2.21; $p=0.005$) and who lived in neighbourhoods characterized by a higher social deprivation (OR=1.70, 95% CI 1.04-2.79; $p=0.036$, OR=2.01, 95% CI 1.23-3.29; $p=0.006$, OR=2.72, 95% CI 1.59-4.63; $p<0.001$) were more likely to report that their child actively commuted to school.

CONCLUSION: Active commuting to school is associated with parental perceptions of safety and area deprivation.

KEY WORDS: Active transport; deprivation; perceived safety; children

La traduction du résumé se trouve à la fin de l'article.

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Childhood physical inactivity is a major public health concern because of its associated societal costs for industrialized societies.¹ Obese children are more likely to become obese adults and experience adverse psychosocial and health issues.² Active transportation (AT) may contribute to reversing rising childhood physical inactivity. It may be particularly important to increase AT among preadolescents aged 9 through 13 years (tweens), during a developmental stage in children's lives when their rates of physical activity decline dramatically. One initiative to promote active lifestyles (including, but not exclusively focusing on AT) among preadolescents in Quebec is *Opération Wixx*, a multimedia physical activity promotion campaign launched by *Québec en forme* in 2012. It was designed to improve preadolescents' attitudes, knowledge and awareness about active lifestyles and opportunities for being active. Using baseline data from a series of repeated cross-sectional surveys aimed at ascertaining the outcomes of the *Opération Wixx* intervention, we examined the association of urban tweens' likelihood of AT with area deprivation and perceived neighbourhood safety by children and their parents.

We focused on perceived neighbourhood safety and area deprivation because these variables are associated with children's active commuting. Parents may not allow young children to travel unaccompanied to school if they have concerns about safety with respect to crime ("danger from strangers") and traffic (e.g., availability of sidewalks and signalized crosswalks).³⁻⁸ Also, low

parental socio-economic status (SES) is associated with AT to school among children, presumably because parents with lower incomes cannot afford a motor vehicle. Living in a lower SES area is associated with more active commuting to school⁹ and with a higher adherence to AT over time, from childhood to adolescence, possibly because these areas are more likely to be characterized by mixed land use as opposed to suburban form.^{10,11} Living in higher SES areas is associated with lower levels of AT, possibly because these areas reflect a car-oriented development urban pattern^{4,12} and because parents consider driving their children to school as one convenient segment of their daily multipurpose trips to workplaces with rigid schedules and to various other destinations required by their other commitments, all within the confines of a limited time budget.¹³ Although encouraging AT as a transport mode among children appears as desirable, selected authors^{11,14,15} have argued

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that the greater likelihood of AT among low-income children might reflect environmental injustice, with children living in low-income areas traveling actively by necessity, but in environments that are more dangerous.

Although recent reviews^{4,9,16} highlight a negative association of active commuting with income and with safety concerns, some studies found a positive¹⁷ or no⁷ association between income and active commuting, as well as a positive¹⁸ or no^{5,7} association between safety and active commuting. Thus, the contributions of parental perceptions of neighbourhood safety and of the socio-economic context to child commuting merit further attention. In particular, it is important to establish whether lower area SES simply coincides with poorer safety and, consequently, with lower perceived neighbourhood safety or whether area deprivation and perceived neighbourhood safety have additive effects.^{19,20} The purpose of this investigation was therefore to examine the associations between area deprivation and perceived neighbourhood safety with AT to school among preadolescents living in urban Quebec.

METHODS

Sample

Baseline data from a larger study using a repeated cross-sectional design over 5 years (2012-2016) to evaluate the effects of the *Opération Wixx*²¹ multimedia campaign were employed. A representative sample of 1,000 dyads composed of preadolescents aged 9 to 13 years (twens) and one each of their parents was recruited by a polling firm in May/June of 2012 using a random digit dialing telephone procedure to participate in a telephone interview about physical activity. To be eligible, adult respondents had to reside in the Province of Quebec, to be the parent or guardian of a child aged 9 to 13 years, to be able to answer survey questions in French or English, and to have a landline telephone. The selection of the sample was stratified according to the administrative regions of the Province of Quebec. Data from a subsample of 809 dyads residing in urban Quebec were analyzed in the present investigation. This subsample was determined based on the household's 6-digit postal code information provided by the respondent parent/guardian, using the Statistics Canada Postal Codes Conversion File (PCCF) Reference Guide to establish whether a postal code was rural or urban.²² In Canada, a second character of zero in a 6-digit postal code identifies a rural postal code, whereas a non-zero second character identifies an urban postal code.²² To assign socio-demographic information corresponding to the dissemination areas in which respondents' households were located, we used 6-digit postal codes provided by the responding parent.

Measures

Active Transportation (AT) to School

Child and parental reports of transportation mode to school were similar to those used in other large-scale population surveys. The child's report of AT to school was assessed by asking the child to describe his/her habitual commuting mode to school in the previous 7 days (i.e., "How did you get to school during the last 7 days"). The following response categories were available as choices: passive commuting (e.g., automobile), active commuting (e.g., walking,

cycling, skateboarding), mixed active and passive commuting (e.g., public transportation, school bus). Responses were dichotomized into "passive commuting" (including passive commuting as well as mixed active and passive commuting) or "active commuting" (including walking, cycling, skateboarding). The parent's report of the child's AT to school was assessed based on the question "How many days per week does your child walk or bike to get to school?" Responses ranged from 0 days to 7 days and were dichotomized into "passive commuting" (0-2 days/week) or "active commuting" (3-7 days/week), to capture the habitual travel mode during the 5 school days.

Socio-demographics

Child variables include child's sex, presence of any impairment that may prevent the child from participating in physical activity (dichotomized as "no impairment" versus "presence of an impairment"), and the child's school level (dichotomized as "secondary and other" versus "primary"). Parental variables include parent's sex, age (in years), education (dichotomized as "more than high school" versus "high school or less"), and family income (dichotomized as "CAN\$40,000 and higher" versus "less than CAN\$40,000" per year).

Area deprivation

Area deprivation was assessed based on the composite indicators of material deprivation (i.e., education, employment and income) and social deprivation (i.e., marital status and the structure of the household/family) that were developed by Pampalon, Gamache and Hamel²³ for all dissemination areas throughout Quebec, using the Canadian Census data from 2006. Quintiles of material and social deprivation were assigned to each dissemination area in Quebec (ranging from Quintile 1 "lowest deprivation" to Quintile 5 "highest deprivation").²³ For this study, quintile values of dissemination areas were linked to the dyads by matching dissemination areas with the 6-digit postal code reported by the parent.

Perceptions of neighbourhood safety

Children's perceived neighbourhood safety was assessed based on children's level of agreement with the following statement: "I feel safe to engage in physical activity in my neighbourhood." Children's responses were dichotomized as "disagree" (including "completely disagree" and "somewhat disagree") versus "agree" (including "somewhat agree" and "completely agree"). Parental perceived neighbourhood safety was assessed based on parents' degree of agreement with the following statement: "I feel at ease to let my child travel on foot or on bicycle from home to school." Parents' responses were dichotomized as "disagree" (including "completely disagree" and "somewhat disagree") and "agree" ("somewhat agree" and "completely agree").

Analyses

Following descriptive analyses, the degree of concordance between parent- and child-reported active commuting as well as child- and parent-reported safety were estimated with Kendall's tau. Logistic regression analyses were used to predict associations between area deprivation, parental and child perceptions of neighbourhood safety, and children's AT. A first set of analyses predicted children's reports of AT, whereas a second set was performed to predict parental reports of the child's AT.

Table 1. Descriptive statistics

Variable	Item description	n (%)
Active transportation variables		
Child's report of active transportation to school:	How did you get to school during the last 7 days?	
Passive commuting		506 (63.1)
Active commuting		297 (36.9)
Parent's report of child's active transportation to school:	How many days has your child commuted actively to school in the previous week?	
Passive commuting		508 (63.3)
Active commuting		295 (36.7)
Socio-demographics		
Child's sex		
Male		411 (50.9)
Female		398 (49.1)
Presence of an impairment		
No		782 (96.7)
Yes		27 (3.3)
Child's school level		
Secondary school (grades 7 and over)		202 (25.0)
Primary school (grades 3-6)		607 (75.0)
Parent's sex		
Male		397 (49.1)
Female		412 (50.9)
Parent's age (in years)		807 (M=41.9, SD = 5.8)
Parent's education		
More than high school		679 (84.0)
High school or less		130 (16.0)
Family income		
≥CAD\$40,000		700 (86.5)
<CAD\$40,000		109 (13.5)
Area deprivation		
Area material deprivation index		
Quintile 1 (Lowest)		224 (29.3)
Quintile 2		206 (26.9)
Quintile 3		127 (16.6)
Quintile 4		123 (16.0)
Quintile 5 (Highest)		86 (11.2)
Area social deprivation index		
Quintile 1 (Lowest)		186 (24.3)
Quintile 2		160 (20.9)
Quintile 3		133 (17.3)
Quintile 4		166 (21.7)
Quintile 5 (Highest)		121 (15.8)
Perception of neighbourhood safety		
Child's perceived safety	I feel safe to engage in physical activity in my neighbourhood	
Disagree		46 (5.8)
Agree		757 (94.2)
Parent's perceived safety	I feel at ease to let my child travel on foot or on bicycle from home to school	
Disagree		329 (45.1)
Agree		401 (54.9)

In the first set of analyses, to predict children's reports of their AT, we examined the role of children's perceived neighbourhood safety in Model 1, followed by the role of parental perceived safety in Model 2. We then included child demographic variables in Model 3, followed by parental demographic variables in Model 4. Afterwards, we included material and social deprivation indices in Models 5 and 6 respectively.

In the second set of analyses, to predict parental reports of children's AT, we examined the role of parental perceived neighbourhood safety using the same models as in the first set of analyses.

For both sets of logistic regression analyses, the effects of the interactions between the parental perceived safety and the material and social deprivation indices were estimated. All analyses were weighted by children's age and sex. Analyses were conducted using IBM SPSS Statistics Software version 22.0.0.1 (IBM Corporation, Chicago, IL).²⁴

RESULTS

The characteristics of our sample are shown in Table 1. Children and parents reported similar accounts of passive (63.1% and 63.3% respectively) versus active (36.9% and 36.7% respectively)

commuting to school. There was also good correspondence between parental and child reports (Kendal's tau=0.72, $p<0.001$). The sample included equal proportions of girls and boys, as well as of female and male parent respondents. The majority of children (96.7%) did not have an impairment to prevent them from being physically active and most (75.0%) were in primary school. Similarly, the majority of children had parents with secondary or higher education (84.0%) and with family incomes higher than CAN\$40,000 per year (86.5%). About 29.3% and 24.3% of children lived in areas with the lowest levels of material and social deprivation respectively, whereas about 11.2% and 15.8% of the children lived in areas with the highest levels of material and social deprivation respectively. The majority of children (94.2%) reported they feel safe to engage in physical activity in their neighbourhood, while only about a half (54.9%) of the parents reported they feel safe to let their child actively commute to school. There was no correspondence between the parental and child reports of perceived neighbourhood safety (Kendal's tau= 0.03, $p=0.47$).

Table 2 provides results of logistic regression analyses examining associations between perceived safety and area deprivation with children's reports of AT to school. In Model 1, children's perceived neighbourhood safety was not associated with AT, but in Model 2 a

Table 2. Results of logistic regression models examining association between perceptions of safety and children's reports of active transportation to school controlling for socio-demographic characteristics among 809 parent-child dyads from urban Quebec in 2012

	Model 1 OR (95% CI)	Model 2 OR (95% CI)	Model 3 OR (95% CI)	Model 4 OR (95% CI)	Model 5 OR (95% CI)	Model 6 OR (95% CI)
Child's perceived safety						
Disagree (ref)	1.00	1.00	1.00	1.00	1.00	1.00
Agree	1.06 (0.55, 2.03)	1.09 (0.56, 2.09)	1.11 (0.57, 2.17)	1.23 (0.63, 2.42)	1.38 (0.69, 2.78)	1.56 (0.77, 3.16)
Parent's perceived safety						
Disagree (ref)		1.00	1.00	1.00	1.00	1.00
Agree		1.69** (1.24, 2.30)	1.70** (1.24, 2.34)	1.69** (1.22, 2.33)	1.76** (1.26, 2.44)	1.75** (1.25, 2.45)
Child's socio-demographic characteristics						
Child's sex						
Male (ref)			1.00	1.00	1.00	1.00
Female			0.64** (0.46, 0.87)	0.64** (0.46, 0.88)	0.63** (0.46, 0.87)	0.61** (0.44, 0.85)
Child's impairment						
No impairment (ref)			1.00	1.00	1.00	1.00
With impairment			1.03 (0.44, 2.43)	0.88 (0.37, 2.09)	0.90 (0.38, 2.16)	0.91 (0.38, 2.19)
Child's school level						
Secondary school (ref)			1.00	1.00	1.00	1.00
Primary school			2.45*** (1.65, 3.63)	2.63*** (1.74, 3.98)	2.75*** (1.80, 4.20)	2.76*** (1.79, 4.25)
Parent's socio-demographic characteristics						
Parent's sex						
Male (ref)				1.00	1.00	1.00
Female				1.06 (0.76, 1.47)	1.04 (0.75, 1.46)	1.05 (0.74, 1.47)
Parent's age				1.02 (0.99, 1.04)	1.02 (0.99, 1.05)	1.01 (0.98, 1.04)
Parent's education						
≥High school (ref)				1.00	1.00	1.00
High school or less				1.01 (0.65, 1.56)	0.85 (0.54, 1.34)	0.92 (0.58, 1.47)
Family income						
≥\$40,000 (ref)				1.00	1.00	1.00
<\$40,000				2.48*** (1.53, 4.03)	2.23** (1.36, 3.66)	1.63 (0.97, 2.75)
Material deprivation index						
Quintile 1 (Low) (ref)					1.00	1.00
Quintile 2					1.20 (0.77, 1.87)	1.16 (0.74, 1.83)
Quintile 3					1.10 (0.66, 1.82)	1.09 (0.65, 1.83)
Quintile 4					1.73* (1.03, 2.91)	1.62 (0.95, 2.75)
Quintile 5 (High)					2.39** (1.31, 4.36)	2.02* (1.09, 3.76)
Social deprivation index						
Quintile 1 (Low) (ref)						1.00
Quintile 2						1.89* (1.14, 3.15)
Quintile 3						1.68 (0.99, 2.86)
Quintile 4						2.25** (1.36, 3.73)
Quintile 5 (High)						3.69*** (2.12, 6.42)

Note: (ref) = reference category; * significant at $p < 0.05$, ** significant at $p < 0.01$, *** significant at $p < 0.001$.

greater parental perceived neighbourhood safety was associated with a greater likelihood of the child reporting AT (OR=1.69, 95% CI 1.24-2.30; $p=0.001$). In Model 3, being a girl (OR=0.64, 95% CI 0.46-0.87; $p=0.005$) was associated with a lower likelihood and being in primary school (OR=2.45, 95% CI 1.65-3.63; $p<0.001$) was linked to a higher likelihood of actively commuting to school. In Model 4, a family income lower than CAN\$40,000 (OR=2.48, 95% CI 1.53-4.03; $p<0.001$) was associated with a higher likelihood of a child reporting actively commuting to school. In Model 5, living in a neighbourhood with a material deprivation index in the two highest quintiles (OR=1.73, 95% CI 1.03-2.91; $p=0.038$ for Quintile 4 and OR=2.39, 95% CI 1.31-4.36; $p=0.004$ for Quintile 5 respectively) was associated with a higher likelihood of a child reporting actively commuting to school. Finally, in Model 6, living in a neighbourhood with a higher social deprivation index was linked to a greater likelihood of the child reporting actively commuting to school (OR=1.89, 95% CI 1.14-3.15; $p=0.014$, OR=2.25, 95% CI 1.36-3.73; $p=0.002$, and OR=3.69, 95% CI 2.12-6.42; $p<0.001$). None of the interactions achieved statistical significance.

Table 3 provides the results of the logistic regression analyses examining associations between perceived safety and area deprivation with parents' reports of AT to school. Greater parental

perceived safety (in Model 2, OR=1.56, 95% CI 1.14-2.12; $p=0.005$), unlike children's perceived safety (in Model 1), was associated with a greater likelihood of reporting the child's AT. In Model 3, being in primary school (OR=1.90, 95% CI 1.30-2.80; $p=0.001$) was associated with a greater likelihood of the parent reporting that the child actively commuted to school. In Model 4, having a family income lower than CAN\$40,000 (OR=1.98, 95% CI 1.24-3.16; $p=0.004$) was associated with a greater likelihood of the parent reporting that the child actively commuted to school. In Model 5, living in a neighbourhood in the highest quintile of the material deprivation index (OR=1.89, 95% CI 1.05-3.41; $p=0.033$) was linked to a greater likelihood of reporting that the child actively commuted to school. In Model 6, living in a neighbourhood in Quintiles 2 (OR=1.70, 95% CI 1.04-2.79; $p=0.036$), 4 (OR=2.01, 95% CI 1.23-3.29; $p=0.006$) and 5 (OR=2.72, 95% CI 1.59-4.63; $p<0.001$) of the social deprivation index was linked to a greater likelihood of reporting that the child actively commuted to school. None of the interactions achieved statistical significance.

DISCUSSION

We investigated the role of neighbourhood safety and area deprivation in influencing AT to school among a sample of tweens

Table 3. Results of logistic regression models examining association between perceptions of safety and parents' reports of active transportation to school controlling for socio-demographic characteristics among 809 parent-child dyads from urban Quebec in 2012

	Model 1 OR (95% CI)	Model 2 OR (95% CI)	Model 3 OR (95% CI)	Model 4 OR (95% CI)	Model 5 OR (95% CI)	Model 6 OR (95% CI)
Child's perceived safety						
Disagree (ref)	1.00	1.00	1.00	1.00	1.00	1.00
Agree	0.84 (0.44, 1.61)	0.85 (0.44, 1.64)	0.91 (0.46, 1.76)	1.02 (0.52, 2.00)	1.08 (0.55, 2.14)	1.18 (0.59, 2.35)
Parent's perceived safety						
Disagree (ref)		1.00	1.00	1.00	1.00	1.00
Agree		1.56** (1.14, 2.12)	1.57** (1.15, 2.15)	1.56** (1.14, 2.15)	1.60** (1.16, 2.21)	1.60** (1.15, 2.21)
Child's socio-demographic characteristics						
Child's sex						
Male (ref)			1.00	1.00	1.00	1.00
Female			0.95 (0.69, 1.29)	0.96 (0.70, 1.31)	0.96 (0.70, 1.32)	0.95 (0.69, 1.31)
Child's impairment						
No impairment (ref)			1.00	1.00	1.00	1.00
With impairment			1.40 (0.62, 3.20)	1.21 (0.52, 2.79)	1.21 (0.52, 2.81)	1.21 (0.52, 2.83)
Child's school level						
Secondary school (ref)			1.00	1.00	1.00	1.00
Primary school			1.90** (1.30, 2.80)	2.02** (1.35, 3.02)	2.07*** (1.38, 3.12)	2.10*** (1.39, 3.18)
Parent's socio-demographic characteristics						
Parent's sex						
Male (ref)				1.00	1.00	1.00
Female				1.33 (0.96, 1.84)	1.34 (0.97, 1.87)	1.37 (0.98, 1.91)
Parent's age				1.01 (0.98, 1.04)	1.01 (0.98, 1.04)	1.01 (0.98, 1.04)
Parent's education						
≥High school (ref)				1.00	1.00	1.00
High school or less				1.02 (0.67, 1.56)	0.94 (0.60, 1.46)	1.01 (0.64, 1.59)
Family income						
≥\$40,000 (ref)				1.00	1.00	1.00
<\$40,000				1.98** (1.24, 3.16)	1.81* (1.12, 2.91)	1.40 (0.85, 2.32)
Material deprivation index						
Quintile 1 (Low) (ref)					1.00	1.00
Quintile 2					1.22 (0.79, 1.89)	1.20 (0.77, 1.87)
Quintile 3					1.02 (0.62, 1.68)	1.03 (0.62, 1.71)
Quintile 4					1.29 (0.77, 2.14)	1.21 (0.72, 2.03)
Quintile 5 (High)					1.89* (1.05, 3.41)	1.65 (0.91, 3.02)
Social deprivation index						
Quintile 1 (Low) (ref)						1.00
Quintile 2						1.70* (1.04, 2.79)
Quintile 3						1.44 (0.86, 2.43)
Quintile 4						2.01** (1.23, 3.29)
Quintile 5 (High)						2.72*** (1.59, 4.63)

Note: (ref) = reference category; * significant at $p < 0.05$, ** significant at $p < 0.01$, *** significant at $p < 0.001$.

living in urban Quebec. Consistent with previous studies,¹⁶ we observed higher odds of AT to school in boys and in primary school children.

However, we also observed a greater likelihood of reporting actively commuting to school if parents perceived that it was safe for their children to commute to school. This association was not attenuated by the inclusion of the deprivation indices in the analysis, although material deprivation was no longer statistically significant once social deprivation was included in the model, indicating that social deprivation may be a stronger predictor of AT. The fact that parental perceived safety remained significant in the final model suggests that above and beyond policies and strategies that ameliorate neighbourhood safety, positively influencing parent perceptions may contribute to increasing AT among preadolescents. Given that a high proportion of the Canadian parents reported increased traffic safety (69%) and cycling infrastructure safety (60%) as potential incentives for more cycling,²⁵ we believe that tangible improvements in neighbourhood safety, resulting in more favourable perceptions on the part of the parents, could encourage active commuting to school.^{18,26} For instance, physical environmental measures designed to ameliorate traffic safety and traffic calming measures – such as introducing

speed bumps and enlarging the sidewalks, in addition to school policies – such as introducing walking school bus programs, may be helpful in encouraging active commuting to school.

Results replicate previous findings indicating that children from areas with higher material and social deprivation are more likely to actively commute to school, emphasizing the environmental injustice dimension of encouraging AT in environments that are characterized by higher deprivation and possibly greater risks of injuries.¹¹ It has been acknowledged that a spatial displacement of risk may occur.¹⁵ That is, there may be increased exposure of children in the more deprived areas (with lower vehicle ownership rates) to higher risks of injury by motorized traffic displaced from the more affluent areas (with higher vehicle ownership rates) because such deprived areas accommodate more external vehicle traffic. Efforts to reverse this situation are particularly needed in large urban areas, as a recent study showed that the geometry of the street network in the more deprived areas was more conducive to higher traffic volumes and to more cyclist and pedestrian injuries.²⁷ Therefore, children who live in deprived areas are at the same time more exposed to environmental hazards, while they have limited transportation alternatives to AT and limited opportunity to decide upon their AT choices. This is a symptom of

environmental inequality because it endangers children's right to *walk safely in the streets on their own, meet friends and play and live in an unpolluted environment*, which are ultimately forms of children's well-being in cities, as described in the United Nation's Child Friendly Cities Initiative.²⁸

To date, numerous studies have been conducted with a focus on children's *right to play*;²⁹ we argue that it is now time to recognize that children also have the *right to walk or cycle to school*, and to emphasize the need to move AT to school higher on the agenda of developing child-friendly city strategies.²⁸ However, parental perceived safety is an essential *sine-qua-non condition for walking or cycling to school* because otherwise AT becomes a constrained choice of children whose right to their city is restricted. Urban planning approaches that enhance connectivity to schools while reducing traffic volumes by diminishing traffic exposure in the school areas³⁰ are needed, in order to alleviate the spatial displacement of risk from traffic¹⁵ and to improve children's traffic safety.

Limitations and strengths

One limitation of this study is its cross-sectional nature, which does not allow inferences about causality. Another limitation of this study is the fact that, given the time of the year for data collection (May/June), seasonality-related changes in AT and in parental perceptions of traffic safety during various seasons were not ascertained. In addition, our measure of children's perceptions of safety was not specific to AT and the question capturing parental reports of active commuting to school may have assessed trips to school rather than trips to and from school. Another limitation of the study is that we did not account for actual levels of safety and we did not consider distance to school. Future studies should include these variables. Strengths of this study include a large sample of children–parent dyads, accounting for both children's and parents' perceptions, and analyzing both individual- and area-level SES information to provide a more accurate consideration of the SES circumstances of the children.

CONCLUSION

In conclusion, this study shows that active commuting to school is associated with area deprivation and parental perceived safety, intimating that physical environmental and policy measures designed to ameliorate neighbourhood safety may be beneficial in encouraging AT to school among preadolescents. Although higher deprivation was associated with a greater likelihood of AT (a favourable outcome), other researchers have noted that higher deprivation also coincides with a greater risk of collisions between pedestrians and motor vehicles. Multisectoral partnerships and policies designed to both reduce deprivation and risk of collisions while maintaining healthful practices like AT represent an emerging challenge. We suggest that active commuting to school could be the focus and priority of a broader discussion aimed at reframing AT as not only a public health issue, but also as a fundamental *right to the city* issue wherein opportunities, desires and externalities are addressed.

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RÉSUMÉ

OBJECTIF : L'objectif de cette étude est d'examiner l'influence de la défavorisation et de la sécurité perçue du quartier sur la pratique du transport actif vers l'école chez les préadolescents vivant en milieu urbain au Québec.

MÉTHODE : Un échantillon de 809 dyades de préadolescents âgés de 9-13 ans et un de leurs parents vivant en milieu urbain au Québec a été recruté par une firme de sondage pour répondre à une entrevue téléphonique en lien avec la campagne multimédia *Opération WIXX*. La campagne multimédia *Opération WIXX* a été lancée par *Québec en Forme* en 2012 pour promouvoir l'activité physique chez les préadolescents. Des modèles de régression logistique ont été utilisés pour prédire la pratique du transport actif vers l'école (auto-rapporté par les préadolescents et un de leurs parents) en fonction de la sécurité perçue du quartier par le parent et du préadolescent et des indices de défavorisation matérielle et sociale du quartier. Les analyses ont été ajustées pour les variables sociodémographiques.

RÉSULTATS : La concordance entre les réponses des enfants et des parents concernant la pratique du transport actif vers l'école était élevée (Kendall's tau=0,70, $p<0,001$). Les enfants dont les parents percevaient leur quartier comme étant sécuritaire (OR=1,75, IC95% 1,25-2,45; $p=0,001$) et qui vivaient dans des quartiers caractérisés par une défavorisation matérielle (OR=2,02, IC95% 1,09-3,76; $p=0,026$) et sociale (OR=3,69, IC95% 2,12-6,42; $p<0,001$) supérieure avaient une probabilité plus élevée de se rendre à l'école en utilisant des modes de transport actif. Les parents percevant leur quartier comme étant sécuritaire (OR=1,60, IC95% 1,15-2,21; $p=0,005$) et qui vivaient dans des quartiers caractérisés par une défavorisation sociale supérieure (OR=1,70 IC95% 1,04-2,79; $p=0,036$, OR=2,01 IC95% 1,23-3,29; $p=0,006$, OR=2,72 IC95% 1,59-4,63; $p<0,001$) avaient une probabilité plus élevée de rapporter que leurs enfants se rendent à l'école en utilisant des modes de transport actif.

CONCLUSION : Le transport actif vers l'école est associé à la sécurité perçue du quartier rapportée par les parents et à la défavorisation du quartier.

MOTS CLÉS : transport actif; défavorisation du quartier; sécurité perçue du quartier; les enfants