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Relative socio-economic position and meaning and purpose in life in adolescents: An intangible cost of social inequalities

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ABSTRACT

Having a sense of meaning in life supports adolescent health but is affected by experiences of wealth or poverty. We examined its associations with relative advantage (RA) and relative deprivation (RD) in a sample of Canadian adolescents (n = 17,634) using survey data from the Health Behaviour in School-aged Children study. We calculated RA and RD using all other schoolmates as reference groups in 238 schools. Descriptively, RA was associated with greater meaning and purpose and RD was associated with less. Regression-based estimates of prevalence ratios (PR) revealed more nuanced patterns. RD was associated with less of a sense of meaning and purpose in females and gender-diverse youth only. RA was associated with a reduced risk of low meaning and purpose in females (PR 0.77; 95 % CI: 0.61 to 0.98), with similar trends in males and gender diverse students that did not achieve significance. Although the association was not pronounced at the ecological (school) level, the negative associations with RD were stronger in more unequal schools. To illustrate, in schools of high wealth inequality, RD was most strongly associated with having low meaning and purpose in females (PR 1.59; 95 % CI: 1.20 to 2.11) and gender diverse adolescents (PR 1.97, 95 % CI: 0.90 to 4.33), with no statistically significant effect in males. These patterns reveal the salience of proximal socioeconomic reference cues for adolescents and offer new insights into why inequalities in health and wellbeing are so challenging to address in youth populations. They also underscore the importance of both socioeconomic position and wealth distribution within school settings, providing impetus for thought and change.

1. Introduction

Recent declines in adolescent mental health and wellbeing (Freeman et al., 2011; McGorry et al., 2024) have been partially attributed to socio-economic circumstances and to growing economic inequality (Marmot, 2004; Cabieses et al., 2016; Elgar et al., 2024). When compared to their more affluent peers, young people who have less material wealth tend to experience lower life satisfaction (Elgar et al., 2024, worse school performance (Morrissey et al., 2014), more externalizing risk behaviours (Simpson et al., 2006), more violence (Contreras et al., 2015), increased emotional problems (Elgar et al., 2013) and poorer general mental health status (Elgar et al., 2024; Torsheim et al., 2006). These patterns follow a graded pattern, where each rung down the metaphorical social ladder (Wilkinson & Pickett, 2017) of affluence leads to poorer health and wellbeing. Hence, socio-economic position is widely recognised as a core structural determinant of adolescent health (Elgar et al., 2013, 2024; Morrissey et al., 2014; Simpson et al., 2006; Contreras et al., 2015; Torsheim et al., 2006; Wilkinson & Pickett, 2017).

Health status depends not only on an individual's socioeconomic standing in society, but also on how evenly that wealth is distributed (Torsheim et al., 2006; Wilkinson and Pickett, 2009, 2017). High economic inequality is the result of large relative differences in wealth, and in affluent countries both are recognised as structural determinants of health. Throughout the lifespan, outcomes are not exclusively driven by how much an individual possesses, but also by differences that arise when they compare what they have to others (Wilkinson & Pickett, 2017; Wilkinson & Pickett, 2009; Elgar et al., 2013, 2024). In terms of

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potential mechanisms that underlie related etiological pathways, feeling poor in relation to a social community elicits feelings of frustration, resentment and stress – what some have called "status anxiety"– that are independently associated with diverse indicators of mental, social and physical health after controlling for absolute measures of affluence (Elgar et al., 2013; Wilkinson & Pickett, 2017; Wilkinson & Pickett, 2009). In adolescents, measures of perceived relative economic advantage/privilege (RA) and perceived relative economic deprivation (RD) have been shown to correlate with wellbeing (Elgar et al., 2024), health, happiness and life satisfaction (Kuo et al., 2024a), teenage pregnancy (Pickett et al., 2005), school bullying (Napoletano et al., 2016), subjective health complaints (Quon & McGrath, 2015), and obesity (Elgar et al., 2016). Observations surrounding RD have been described as the effects of "poverty amid plenty" (Elgar et al., 2016), and beyond individual socio-economic position, speak to the importance of a young person's position in society in relation to others around them in the origins of health and disease.

Both tangible and intangible factors are known to determine the health of adolescents. Evidence in support of the idea that economic inequality is a determinant of health (Elgar et al. 2013; Torsheim et al., 2006; Wilkinson & Pickett, 2017; Kuo et al., 2024a; Pickett et al., 2005; Napoletano et al., 2016; Quon & McGrath, 2015) is typically described in terms of access to resources such as a secure food supply (Hawkins & Panzera, 2021), material wealth (Marmot, 2004), and adequate housing (Rolfe et al., 2020). Consideration of "intangible resources" such as having a sense of "meaning and purpose in life" too has drawn recent attention (Michaelson et al., 2024; Michaelson, Smigelskas, King, Inchley, & Malinowska-Cieslik, 2023; Michaelson, King, Patte, Gardner, & Pickett, 2023; Crisp, 2021; Marmot, 2022a), and consideration of such resources broadens the ways that social determinants of health are understood. In Canada (Michaelson, King, Patte, Gardner, & Pickett, 2023) and globally (Michaelson et al., 2024), having a sense of meaning and purpose has been identified as one intangible resource that is highly protective to young people as they grow and develop. Economic advantage achieved through access to wealth appears to be highly correlated with this indicator of meaning and purpose in life, pointing to one mechanism whereby health inequities arise. Young people who are less well-off may be deprived in terms of their health status and such intermediary factors that lead to it. This thinking aligns with a 2023 study of Taiwanese adults, which showed that relative deprivation was associated with six social outcomes, including perceived "meaning in life" (Kuo & Kawachi, 2023). Hence, having a sense of meaning and purpose in life is an important consideration in terms of health equity across the lifespan. Given that income inequality in Canada continues to rise (Marchand et al., 2020), research that contributes to understanding the impact of relative advantage and relative deprivation on adolescent mental health is also important. A deeper understanding of the social structures that facilitate having a sense of meaning in life for some people and not for others could contribute to the promotion of health equity and to health advocacy efforts that target specific populations.

In the current analysis, we explored these new ideas within a nationally representative, Canadian school-based study of adolescents (Freeman et al, 2011; Craig et al., 2020). Our objectives were to: (1) describe the occurrence of relative advantage and relative deprivation using scaled, objective measures of family affluence; (2) explore relationships between these relative indicators and having a sense of meaning and purpose in their lives, and whether they differ in schools with and without high levels of socio-economic inequality. We hypothesized that relative deprivation would impair the abilities of students to develop a sense of meaning and purpose, especially in schools that were the most unequal in terms of the distribution of perceived wealth. We had no *a priori* hypotheses about the effects of relative advantage on meaning and purpose in life other than social determinants of health models (WHO Commission on Social Determinants of Health & World Health Organization, 2008), which suggest that relative wealth would likely advantage more affluent adolescents. In the end, study findings have the potential to provide novel evidence to inform social theory about the intangible factors that govern health equality, and to provide direction for educational, clinical and other health promotion efforts aimed at optimizing health and wellbeing in adolescent populations.

2. Methods

2.1. Data source and sample

We used survey data from the 2017-18 Canadian Health Behaviour in School-aged Children (HBSC) study (Craig et al., 2020). HBSC is a cross-national (Inchley et al., 2020) general health survey administered every four years in some 50+ countries. In Canada, adolescents in grades 6 to 10 (typically aged 11–15 years) were recruited through a multi-stage sampling approach, with participants (n = 21,745) nested within 287 schools selected to be geographically representative. Sampling was stratified by type of school and geographic regions of Canada on a replacement basis. Exclusions to the present analysis were: (1) missing the core family affluence scale (n = 3973) which was not asked in some jurisdictions (two Canadian Territories); (2) due to instability in estimation, students from 20 small schools with <10 students (n = 138), leaving a final sample for analysis of 17,634 (weighted n = 18,956) students from 238 schools. Of these, 15,583 (weighted n = 16,878) had complete information on all measures (exposures, outcomes, covariates) for the regression modelling, considered in a complete case analysis. Participants excluded due to missing data (n = 2051) were more likely to be in the relative deprivation group (28.2 % vs 24.7 %, p = .001), and to identify as gender diverse (2.5 % vs 1.4 %, p < .001). Missing data was not related to age, sense of meaning and purpose, or relative advantage.

2.2. Data collection

Participants completed an anonymous questionnaire in a paper or online format during a 60-minute classroom session. Questionnaires were returned to Queen's University for data entry, cleaning, and analysis.

2.3. Key variables

2.3.1. Material wealth

Students answered six items in HBSC's *Family Affluence Scale (FAS III)* (Hartley et al., 2016). This composite scale includes items describing material conditions in households, including items symbolic of material assets in the family residence (bedroom ownership, bathrooms, dishwashers) and related possessions and experiences (computer ownership, family vacations, vehicles). Summary scores range from 0 to 13 (continuous).

2.3.2. Relative advantage and deprivation

We estimated an FAS III continuous score for each participant. We then calculated Yitzhaki index scores (Yitzhaki, 1983) to summarize differences between individual FAS III levels (i) and the FAS III levels of their schoolmates (j).

$$\mathrm{RD}_i = \frac{1}{N}\sum_j \left(y_j - y_i\right), \forall \left(y_j > y_i\right)$$

Relative deprivation (RD) was estimated using this index, which represented the average difference between a respondent's FAS III score and all respondents at the same school with a higher FAS III score, weighted by the proportion of schoolmates with a higher FAS III score. Relative advantage (RA) was estimated similarly, and represented the difference between a respondent's FAS III score and all respondents at the same school with a lower FAS III score, weighted by the proportion of schoolmates with a lower FAS III score. Three relative affluence

groups were then created using the continuous Yitzhaki index scores. Students who were "advantaged" (the top quartile or ≥4.2 in the RA score) and "deprived" (the top quartile or ≥2.17 in the RD score) were identified, and all other students were classified as "neutral."

2.3.3. Meaning and purpose

Participants rated how important it was for them to feel that their life had "meaning or purpose", with five response options ranging from 1- "not at all important" to 5- "very important". Scores were re-classified into categories described as "low" (1-2), vs. "neutral" (3) or "high" (4–5) importance, which was transformed into the primary study outcome (low meaning and purpose vs. everyone else).

2.3.4 Covariates that could confound or modify the relationship between the two versions of the Yitzhaki index (RA and RD) and the outcome of "low meaning and purpose in life" included: age (in years), gender identity (male, female, "neither term describes me"), immigration status (born in Canada, lived in Canada 5 years or less, lived in Canada >5 years), and family structure (lived with: mother and father, mother and partner, mother only, father and partner, father only, other). At an area level, school postal codes were classified by Statistics Canada population sizes, providing an ecological measure of urban-rural status applied to each attending study participant (rural area (<1000 people), small centre (1000 to 24,999), medium centre (30,000 to 99,999), large centre (100,000 or more) (Statistics Canada, 2013).

To estimate equality in material advantage at the school level, Gini coefficient values (Davies et al., 2006) were estimated by dividing the mean level of RD observed in each school, by the overall, mean level of absolute material affluence across the school in terms of FAS III, with values that could theoretically range from 0 (perfect equality) to 1 (perfect inequality). Based on the median value of the observed distribution, Gini estimates ≤0.19 were classified as "low inequality", while estimates >0.19 were classified as "high inequality".

2.4. Human subjects

HBSC Canada received ethics approval from the federal government (HC/PHAC REB 2013-022P) and two of our respective institutions (Queen's University: GMISC-062-13; Brock University: HSREB 21–314). Parental consent was active or passive, dependent upon local school board requirements, and child assent was also obtained. The response rate at the individual participant level was 74 %.

2.5. Statistical analysis

Analyses were conducted in SAS Version 9.4 (SAS Institute, Cary, NC). We restricted the sample to students with complete data on key variables of interest. A weighting variable was applied to ensure national representativeness by grade and geographic region. We excluded students who had not completed questionnaire items using a complete case analysis approach.

2.5.1. Descriptive analysis

At the individual student level, median (interquartile range; IRQ) scores for RA and RD were summarized for the overall sample, then by groups defined by meaning and purpose in life (low, medium and high), as well as available covariates (age, gender, urban-rural status, immigration status, family structure). We then profiled the percentage of students who were classified as having low, medium and high meaning and purpose, overall and within groups defined by RA, neutral and RD, and all other covariates. Differences in proportions reporting low meaning and purpose were tested using Rao-Scott Chi-Square tests, adjusting for the clustered data structure, with students nested within schools.

2.5.2. Initial models

In a related series of Poisson regression analyses, we examined associations between RA and then RD and the core outcome of "low meaning and purpose in life." We first tested whether gender identity moderated these associations by including interaction terms in the crude models. A statistically significant interaction between RD and gender (males vs. females $p = .03$, and male vs. gender diverse $p = .02$) lead us to stratify the analyses by gender. Modelling was then performed in three stages. First, a crude model was estimated within each gender strata. *Second*, adjusted estimates were generated from models that controlled for other salient covariates (age, immigration status, urban-rural geographic status and family structure). *Third,* these adjusted models were repeated, but with inclusion of a summary level of affluence (mean FAS III) at the school level. A prevalence ratio generated from these models of >1 (with confidence intervals that excluded this null value) was interpreted as having less meaning and purpose in life. A prevalence ratio of <1 was interpreted as having enhanced meaning and purpose. Generalized estimating equations were used to adjust all models for clustering at the school level.

2.5.3. Additional models

We next classified the participating schools by the level of inequality observed in material affluence (FAS III, above), as indicated by the Gini coefficient (Davies et al., 2006). At the school level, Pearson's statistics were estimated to describe the strength and statistical significance of associations between these Gini estimates and mean scores of meaning and purpose within the schools. At the individual student level, crude, partially adjusted, then fully adjustment models (as above) were applied in groups of schools with low and high inequality, again stratified by gender.

3. Results

Table 1 describes the median (IQR) RA and RD scores in terms of material wealth. This is done for the overall sample, then within groups defined by the key study outcome, then salient covariates. Scores for RA varied from 0.0 to 7.88, and scores for RD ranged from 0.0 to 9.08. RA and RD were highly correlated (Pearson's $r = -0.82$). Both index scores varied by the indicator of meaning and purpose in life, with higher RA associated with a higher sense of meaning and purpose (Yitzahki index RA score 2.33 vs 1.60; $p < .001$ for high vs low meaning and purpose), and higher RD associated with lower meaning and purpose (RD score 1.08 vs. 1.41, $p < .001$, for high vs. low meaning and purpose). RA and RD did not vary substantially by age; however, gender diverse students reported less RA (RA score 1.45 vs. 2.12 for females and 2.33 for males; $p < .001$) and more RD (RD score 1.69 vs. 1.15 for females and 1.10 for males, $p < .001$). Recent immigrants ($p < .001$) and youth from single parent households ($p < .0001$) also reported more deprivation.

Table 2 describes ratings of meaning and purpose in life by positions of RA and RD, and according to the other core study variables. Students in positions of advantage were the least likely to report low meaning and purpose (5.6 % vs. 8.0 %, χ^2 $p < .001$), while those in positions of deprivation were the most likely (8.9 % vs 6.8 %, χ^2 $p < .001$). Male students were slightly more likely to report low meaning and purpose than females (7.6 % vs. 6.5 %, χ^2 $p = .045$). Additionally, gender diverse students (31.3 % vs. 7.0 %, χ^2 $p< .001$), students from rural or small centres (8.3 % vs. 6.6 %, χ^2 $p = .01$), those not living with both parents (10.8 % vs. 6.2 %, χ^2 $p < .001$), and students aged 13 and older (7.6 % vs. 12.4 %, χ^2 $p = .004$) were more likely to report low meaning and purpose.

Findings from an initial series of Poisson regression models describing associations between RA then RD and having a sense of low meaning and purpose in life are shown in Table 3. Overall, students in positions of RA compared with their school peers were less likely to report low meaning and purpose, although statistical significance was not always achieved in partially and fully adjusted models, especially among the small group of gender diverse students (PR 0.71; 95 % CI: 0.28 to 1.81). Females (PR 1.35; 95 % CI: 1.06 to 1.72) and gender

Table 1
Median (interquartile range) of relative advantage and relative deprivation, as estimated by the Yitzhaki Index, in terms of the importance of meaning and purpose in life and demographic covariates.

			Yitzhaki Index			
			Relative Advantage		Relative Deprivation	
	No.	(col%)	Med	(IQR)	Med	(IQR)
Overall sample	18956	(100)	2.23	(0.73–4.54)	1.13	(0.38–2.20)
Importance of meaning and purpose in life						
Low (Not Important)	1373	(7.4)	1.60	(0.42–3.85)	1.41	(0.54–2.57)
Neutral	2183	(11.7)	1.89	(0.60–3.88)	1.32	(0.52–2.36)
High (Important)	15119	(81.0)	2.33	(0.79–4.69)	1.08	(0.34–2.17)
Relative Affluence Group						
Advantaged	5135	(27.1)	5.79	(5.13–6.68)	0.12	(0.00–0.26)
Neutral	8872	(46.8)	2.18	(1.50–3.16)	1.14	(0.81–1.61)
Deprived	4950	(26.1)	0.27	(0.07–0.54)	3.04	(2.50–3.80)
Age						
≤11	1989	(10.6)	2.42	(0.83–4.63)	1.10	(0.32–2.17)
12	3653	(19.5)	2.31	(0.73–4.57)	1.14	(0.35–2.23)
13	3972	(21.2)	2.10	(0.73–4.46)	1.20	(0.40–2.23)
14	4193	(22.4)	2.15	(0.71–4.59)	1.19	(0.40–2.23)
≥15	4907	(26.2)	2.25	(0.75–4.51)	1.05	(0.40–2.15)
Gender						
Male	8629	(46.9)	2.33	(0.87–4.61)	1.10	(0.36–2.11)
Female	9934	(52.8)	2.12	(0.68–4.48)	1.15	(0.40–2.26)
Gender Diverse	257	(1.4)	1.45	(0.41–3.53)	1.69	(0.65–2.64)
Urban-rural Status						
Rural area (<1000)	185	(1.0)	2.35	(0.41–3.86)	1.18	(0.49–1.85)
Small Centre (1000 to 29,999)	8430	(44.5)	2.12	(0.72–4.50)	1.13	(0.44–2.17)
Medium Centre (30,000 to 99,999)	3459	(18.3)	2.17	(0.78–4.57)	1.17	(0.35–2.27)
Large Centre (≥100,000)	6882	(26.3)	2.34	(0.74–4.63)	1.13	(0.34–2.31)
Immigration Status						
Born in Canada	13320	(76.6)	2.23	(0.74–4.51)	1.13	(0.39–2.18)
Lived in Canada >5 years	3486	(16.7)	2.44	(0.79–4.68)	1.00	(0.32–2.08)
Lived in Canada ≤5 years	935	(6.7)	1.68	(0.41–4.22)	1.47	(0.47–2.95)
Family Structure						
Mother and Father	13887	(74.8)	2.63	(1.00–4.79)	1.00	(0.32–1.97)
Mother and Partner	1041	(5.6)	1.56	(0.41–3.71)	1.49	(0.63–2.51)
Mother Only	2510	(15.5)	1.20	(0.26–3.40)	1.78	(0.70–3.04)
Father and Partner	251	(1.4)	1.89	(0.44–4.00)	1.58	(0.49–2.54)
Father only	473	(2.6)	0.91	(0.21–3.10)	1.87	(0.88–3.21)
Other	393	(2.1)	1.63	(0.39–4.01)	1.51	(0.49–2.55)

Notes: (1) All values are weighted, (2) Med = Median, IQR= Interquartile Range.

diverse students (PR 1.75; 95 % CI: 1.09 to 2.82) who were in positions of RD were more likely to report low meaning and purpose. Findings for males showed no association between RD and low meaning and purpose.

At the school level, the correlation between Gini scores and mean levels of meaning and purpose within participating schools was −0.08 (p = .25). While not statistically significant, this was in the direction whereby greater school level inequality was associated with lower mean levels of meaning and purpose.

Table 4 then presents findings from the additional regression models conducted at the individual level, stratified by level of school level inequality, as grouped by Gini score. Among boys, the protective effects of RA were most apparent in schools with low inequality (PR 0.54; 95 % CI: 0.41 to 0.72). No other statistically significant effects were observed for males experiencing RA or RD. Among girls, the protective effects associated with RA (PR 0.54; 95 % CI: 0.35 to 0.83) and the negative effects of RD (PR 1.59; 95 % CI: 1.20 to 2.11) were most apparent in schools with high inequality. Sample sizes for the gender diverse group were small, although in crude models there appeared to be a strong and statistically significant association between RD and low meaning and purpose in schools with high inequality (PR 2.72; 95 % CI: 1.49 to 4.96).

4. Discussion

In this novel national study of young Canadians, we examined relationships between indicators of relative affluence in relation to schoolmates and their perceived sense of meaning and purpose in life. Our analysis used student-reported data on material assets to estimate relative positions of socioeconomic advantage and deprivation, both overall and within demographic subgroups. Our first important finding was that – consistent with *a priori* hypotheses – for many who sit in lower positions of the social gradient, in each way that we measured it, RD was associated with a lower sense of meaning and purpose in life, especially among females and gender-diverse students. Findings for males were less conclusive. Second, most students who experienced RA compared with their school peers also reported a higher sense of meaning and purpose in their lives. And third, among females and gender-diverse youth, but not males, these associations were especially pronounced in schools that were highly unequal in terms of material wealth. That is, the associations of RA and RD with youth well-being were intensified by school-level economic inequality. In areas with higher Gini-coefficients, the negative association between economic disadvantage and health was also intensified (Kuo & Chen, 2018). Consistent with others (Evans-et al., 2024) we identified a joint effect between relative individual disadvantage and school level economic inequality, creating a "double disadvantage" (Evans-et al., 2024; Kuo & Chen, 2018) for individuals who share both experiences. In other words, it is potentially the combination of attending school in a highly unequal setting and individual disadvantage that makes the negative relationship with meaning in life more pronounced for female or gender diverse youth compared with boys. These findings are also consistent with the notion that unequal distribution of wealth, not just low socioeconomic standing, is harmful for youth well-being. But provocatively, this pattern was not observed universally in all groups of young people. Boys who reported RD did not report differences in experiences of meaning and

Table 2
Percentage of young people rating meaning and purpose in life as important, overall, then in terms of relative advantage and deprivation and demographic covariates.

	Meaning and Purpose in Life					
	Low (Not Important)		Neutral		High (Important)	
	n (row %)					
Overall sample	1373	(7.4)	2183	(11.7)	15119	(81.0)
Relative Affluence Group						
Advantaged	284	(5.6)	464	(9.2)	4310	(85.2)
Neutral	653	(7.5)	1069	(12.2)	7017	(80.3)
Deprived	436	(8.9)	649	(13.3)	3793	(77.8)
Age						
≤11	105	(5.4)	190	(9.7)	1653	(84.9)
12	244	(6.9)	420	(11.8)	2899	(81.4)
13	339	(8.6)	485	(12.4)	3102	(79.0)
14	324	(7.8)	519	(12.5)	3300	(79.7)
≥15	343	(7.1)	551	(11.3)	3967	(81.6)
Gender Identity						
Male	641	(7.6)	1045	(12.3)	6809	(80.2)
Female	640	(6.5)	1078	(11.0)	8087	(82.5)
Gender Diverse	77	(31.3)	44	(17.9)	126	(50.9)
Urban-rural Status						
Rural area (<1000)	21	(11.4)	31	(16.8)	132	(71.8)
Small Centre (1000–29,999)	683	(8.2)	1041	(12.5)	6597	(79.3)
Medium Centre (30,000–99,999)	221	(6.5)	364	(10.7)	2810	(82.8)
Large Centre (≥100,000)	447	(6.6)	747	(11.0)	5580	(82.4)
Immigration Status						
Born in Canada	998	(7.6)	1593	(12.1)	10534	(80.3)
Lived in Canada >5 years	234	(6.8)	367	(10.7)	2841	(82.5)
Lived in Canada ≤5 years	75	(8.1)	99	(10.7)	745	(81.1)
Family Structure						
Mother and Father	849	(6.2)	1420	(10.4)	11414	(83.4)
Mother and Partner	104	(10.1)	163	(15.8)	767	(74.2)
Mother Only	239	(9.7)	369	(15.0)	1860	(75.4)
Father and Partner	28	(11.3)	36	(14.2)	187	(74.5)
Father only	64	(13.7)	78	(16.8)	324	(69.5)
Other	61	(15.7)	64	(16.4)	264	(67.9)

Note: All values are weighted.

Table 3
Results of Poisson regression analyses examining associations between level of relative affluence within a school community and a sense of low meaning and purpose in life (a PR > 1 reflects low levels of meaning and purpose); stratified by gender.

	Prevalence Ratio (PR) and 95 % confidence interval			
	RA vs. Neutral and RD		RD vs. Neutral and RA	
Males (n = 7732)				
Crude Model	0.76	(0.55–1.01)	0.98	(0.77–1.26)
Adjusted Model 1	0.77	(0.58–1.02)	0.91	(0.71–1.17)
Adjusted Model 2	0.80	(0.60–1.06)	0.94	(0.73–1.20)
Females (n = 8931)				
Crude Model	0.69	(0.55–0.88)	1.50	(1.17–1.92)
Adjusted Model 1	0.75	(0.59–0.96)	1.33	(1.04–1.70)
Adjusted Model 2	0.77	(0.61–0.98)	1.35	(1.06–1.72)
Gender Diverse (n = 215)				
Crude Model	0.37	(0.14–1.00)	2.06	(1.21–3.49)
Adjusted Model 1	0.64	(0.25–1.59)	1.77	(1.10–2.84)
Adjusted Model 2	0.71	(0.28–1.81)	1.75	(1.09–2.82)

Adjusted Model 1: Age, Immigration Status, Geography, Family Structure.
Adjusted Model 2: Age, Immigration Status, Geography, Family Structure, School-level Affluence.
Models are weighted and adjusted for school-level clustering.
RA = Advantaged (top 25% of the relative advantage score (≥4.2)), RD = Deprived (top 25% of the relative deprivation score (≥2.17)), Neutral (not in the top 25% on the relative deprivation or advantage measures).

purpose. Moreover, young people who reported FAS III levels that positioned them as economically advantaged compared to their schoolmates also were privileged in terms of meaning and purpose in life compared with those around them.

Our observed associations among girls and gender diverse youth were consistent with relative deprivation theory. For both groups, feeling poor in relation to those around them impacted their health in deleterious ways that were not observed in boys. This gendered observation aligns with recent population health studies demonstrating that girls not only experience meaning and purpose in life differently than boys (Michaelson et al., 2024; Michaelson, King, Patte, Gardner, & Pickett, 2023), they experience mental health and health risk behaviours and sense their socioeconomic position more acutely as well (Li et al., 2021; Terhaag et al., 2021).

It may be that boys, girls, and gender diverse youth also experience the social pressures that come with being deprived of material assets differently, including the stress evoked by "status anxiety" (Elgar, 2010, 2013; Wilkinson & Pickett, 2017; Wilkinson & Pickett, 2009; Kuo et al., 2024a; Pickett et al., 2005; Napoletano et al., 2016; Quon & McGrath, 2015; Hawkins & Panzera, 2021; Rolfe et al., 2020; Michaelson et al., 2024; Michaelson, Smigelskas, King, Inchley, & Malinowska-Cieslik, 2023; Michaelson, King, Patte, Gardner, & Pickett, 2023). Other research suggests that RD relates strongly to internalized feelings of well-being and life satisfaction but does not relate to externalizing dimensions of mental health (Elgar et al., 2013). This too provides insights into this curious finding because internalizing experiences of mental health are more commonly experienced by girls whereas externalizing dimensions of mental health are more commonly experienced by boys (Inchley et al., 2020). Meaning and purpose could be considered more of an "internalizing experience". Social pressures experienced by boys may have less relevance to internalized behaviours and perceptions, including our measures of meaning and purpose, but instead be more likely to affect externalized behaviours and feelings that were not studied here. Less is known about the experiences of gender diverse individuals in these dimensions of life. Beyond subjective feelings, this finding may also be interpreted as what others (Kuo et al., 2024b; Nussbaum, 2017; Sen, 1997) have described as a "capability failure". Regardless of how young people feel about their relative socioeconomic position compared with their peers, objectively they may not have access to the resources and relationships that would enable them to pursue experiences that are meaningful to them due to economic disadvantage (Kuo et al., 2024b; Nussbaum, 2017; Sen, 1997).

A second unexpected finding surrounded the observed effects of RA on a young person's sense of meaning and purpose. Most students who reported having higher material wealth relative to their school peers also reported a higher sense of meaning and purpose in their lives. This augments the seminal ecological findings of Wilkinson and Pickett, who demonstrated that "inequality hurts everyone", including those at the top of the metaphorical social ladder (Wilkinson & Pickett, 2009). Wilkinson and Pickett suggest that in the most unequal societies the health of everyone is worse, including those who experience RA (Wilkinson & Pickett, 2009). Our analysis provides additional nuance to their observations for adolescent populations. While our findings do support the contention that inequality is harmful to girls and gender diverse people who are — and importantly, who may feel — materially disadvantaged, inequality does not appear to be associated with a lower sense of meaning and purpose in life among most young people who are socioeconomically advantaged. In fact, the opposite is true in that relative inequality seems to advantage those with more material wealth. This notion too is consistent with recent longitudinal work in adults demonstrating that high income earners have less status anxiety and appear to benefit from inequality (Bartram, 2022). This idea has troubling implications. It may provide insight into why inequalities are such a persistent challenge to address: because not only are young people who experience RA not harmed in terms of having a sense of meaning in life, they are actually better off compared with their more deprived

Table 4
Results of Poisson regression analyses examining associations between relative affluence within a school community and a low sense of meaning and purpose in life among individual study participants (a PR > 1 reflects low levels of meaning and purpose); stratified by school level inequality (Gini Index) and gender.

	Low School Inequality (Gini = 0.092 to 0.19)				High School Inequality (Gini = 0.191 to 0.313)			
	RA vs. Neutral and RD		RD vs. Neutral and RA		RA vs. Neutral and RD		RD vs. Neutral and RA	
Males (n = 4715/3017)								
Crude Model	0.54	(0.40–0.74)	1.11	(0.81–1.53)	1.20	(0.75–1.91)	0.82	(0.55–1.21)
Adjusted Model 1	0.53	(0.39–0.71)	1.05	(0.77–1.44)	1.24	(0.80–1.92)	0.74	(0.50–1.08)
Adjusted Model 2	0.54	(0.41–0.72)	1.09	(0.81–1.47)	1.29	(0.83–2.00)	0.76	(0.52–1.11)
Females (n = 5308/3623)								
Crude Model	0.87	(0.66–1.15)	1.31	(0.90–1.90)	0.47	(0.31–0.72)	1.75	(1.31–2.34)
Adjusted Model 1	0.92	(0.70–1.22)	1.18	(0.82–1.70)	0.53	(0.34–0.81)	1.56	(1.18–2.07)
Adjusted Model 2	0.95	(0.72–1.25)	1.20	(0.84–1.71)	0.54	(0.35–0.83)	1.59	(1.20–2.11)
Gender Diverse (n = 103/113)								
Crude Model *	*		1.54	(0.65–3.65)	0.37	(0.12–1.14)	2.72	(1.49–4.96)
Adjusted Model 1	*		*		0.46	(0.18–1.18)	2.11	(1.01–4.40)
Adjusted Model 2	*		*		0.59	(0.22–1.60)	1.97	(0.90–4.33)

*Notes: (1) Adjusted Model 1: Age, Immigration Status, Geography, Family Structure, (2) Adjusted Model 2: Age, Immigration Status, Geography, Family Structure, School-level Affluence, (3) * Model did not converge, (4) Models are weighted and adjusted for school-level clustering, (5)* RA = Advantaged (top 25% of the relative advantage score (≥4.2)), RD = Deprived (top 25% of the relative deprivation score (≥2.17)), Neutral (not in the top 25% on the relative deprivation or advantage measures).

peers. This increased sense of meaning would be clearly protective of their mental health. The notion that more affluent youth benefit from this disparity and the social power that comes with it makes it particularly difficult to address via policy, social programming, and other health promotion efforts.

Income inequality in Canada continues to rise (Marchand et al., 2020), and these study findings provide foundational evidence to support the targeting of interventions aimed at supporting adolescent mental health through supporting having a sense of meaning in life. To illustrate, when young people have the experience of "feeling poor among plenty" (Elgar et al, 2014), it may fuel anxiety about their place in society and their internal feelings about the value and purpose of their own lives. Targeting these youth by providing, or even "socially prescribing" (Hayes et al., 2024; Muhl et al., 2023) experiences that foster meaning and purpose in educational, clinical or other contexts may be of value. Social prescribing enables healthcare professionals to refer people to non-medical community services through a "social prescription" (Muhl et al., 2023). This may include a wide range of activities. For example, a social prescription could include arts programs, nature-based activities, and volunteering, dependent upon context (Hayes et al., 2024). It may also include providing access to activities or to meaningful community service tasks that enrich their life experiences and enhance appreciation of what they have, thereby improving self-esteem and confidence, resiliency, and positive mental health (Yates & Youniss, 1996). Based on our study findings, girls and gender diverse young people might especially benefit from these targeted interventions, recognizing that while such referrals may fill important gaps in mental health support (Muhl et al., 2025), they are not appropriate for addressing complex mental health needs (Hayes et al., 2024). In addition, we and others (Poole & Huxley, 2024) remain cautious about such approaches long-term, because while they may contribute to improving an individual's health, they are limited in that they do not address concretely the root causes of the disparity, which is unequal distribution of wealth between rich and poor people. These gaps continue to widen and need urgent policy action.

Our study findings also provide direction for future research. While we have demonstrated that RA and RD are each associated with differences in meaning and purpose in adolescents, explanations as to why such differences exist remain elusive. Studies that test possible mechanisms, thereby advancing theory, are especially required. One promising route of enquiry involves central capabilities theory (Marmot, 2022b; Nussbaum, 1997; Sen, 2007; Venkatapuram, 2018, pp. 553–558). This would suggest that what is important in evaluating adolescent health and well-being is not what people have absolutely, but what each person is able to accomplish in their daily lives with available resources. It may be that when young people experience material deprivation, they are not able to access the conditions, relationships, or experiences that would foster what is meaningful for them. Population health studies rarely contain valid measures to directly assess such qualities, nor the conceptual frameworks to organize the modelling of associated pathways. Further research, both quantitative and qualitative, is required to develop and apply such measures and frameworks to the study of these possible mechanisms that underlie the social patterns that are observed. This would provide the potential for deeper insight into how relative advantage and deprivation shape and constrain meaning and purpose in adolescent lives.

Strengths of our study include its novelty theoretically, both in terms of considering having a sense of meaning and purpose in life as an "intangible resource" that acts as an intermediary determinant of adolescent health, as well as our consideration of the potential effects of relative socioeconomic advantage and disadvantage on this sense of meaning and purpose, while controlling for absolute indicators of material wealth. The analysis benefited from its size and national scope, which enhanced its representativeness and permitted separate study of important subgroups of students. Our use of standard validated measures also reduced the potential for misclassification and associated information bias. A particular strength of the FAS-III is that it provides an objective measure of material assets in language understandable to children (Hartley et al., 2016). Based on the FAS-III values, our study provided direct measures of RA and RD, as compared to previous studies that necessarily relied on subjective appraisals of status and RD (Adler et al., 1994; Goodman et al., 2001). Study limitations include the fact that HBSC is a cross-sectional study, which inhibits our ability to make causal inferences (although current analyses using analogous longitudinal Canadian data (data not shown) confirm the implied temporal sequence). While the inclusion of gender diverse students was a strength, limited cell sizes prevented some adjusted models from being maximized. There was a potential for some loss of representativeness due to study exclusions (i.e., incomplete data, students from small schools). We were unable to statistically control for individual absolute affluence due to its collinearity with RA and RD, and consequently could not fully disentangle the effects of absolute and relative material wealth. Due to the fact that participants with missing data systematically differed from those included in the analysis, the estimated relationship between relative deprivation and a person's sense of meaning and purpose in life may have been subject to selection bias. The HBSC item surrounding having a sense of meaning and purpose in life was indirect in nature and asked about the importance of this construct in the lives of survey respondents, rather than about direct individual experiences. Finally, participants with low meaning and purpose in their lives were designated as having the primary study outcome, with all others were classified as not having this outcome. The latter group combined

adolescents with neutral to high levels of meaning and purpose together. This decision – conservatively – masked the presence of even stronger associations that could be demonstrated should the latter group of participants be considered in more heterogenous categories.

Our findings have implications for the study of socioeconomic determinants of youth wellbeing and for clinical or policy applications. *First,* they extend the literature on the negative consequences of inequality on young people's wellbeing. Most previous studies of this kind have focused on adult morbidity. By understanding social patterns in this foundational aspect of youth wellbeing, we show how economic inequality and status together share such robust associations with stress-related health problems in later years. *Second,* it points to one potent mechanism that may underlie structural inequalities in the health of children, and a deeper reason why gradients in health status are consistently observed at the population level. *Third,* it provides a practical point of intervention that can be addressed in clinical, educational and other health promotion settings to optimize the health of adolescents. Given that a sense of meaning and purpose in life varies by wealth and is also highly associated with health status (Michaelson et al., 2024; Michaelson, Smigelskas, King, Inchley, & Malinowska-Cieslik, 2023; Michaelson, King, Patte, Gardner, & Pickett, 2023), the fostering of experiences that lead to such connections may represent a viable means of promoting health in each of these settings, to be tested in evaluative studies. Our findings suggest a need for such interventions to be targeted by gender, and to recognize the unique needs and double disadvantage experienced by girls and gender diverse youth in highly unequal school contexts. In addition, they provide yet another example of considering *relative measures* of advantage and deprivation in the study of adolescent health inequalities, building on work with *absolute measures* of socioeconomic position. Our study also reminds us that inequalities happen within context, and that the effects of wealth on society operate within individuals and as a response to the structural environment that surrounds them.

Finally, these findings give us pause to reconsider the idea that inequality is bad for all adolescents. In fact, our findings suggest that some young people appear to benefit from inequalities at the expense of others. This is a disturbing notion and provides insight into why persistent inequities are so challenging to change. It also points to our moral imperative as a society to urgently address the growing gap between wealthy and poor populations. In our study, we demonstrate that having a sense of meaning and purpose varies by relative levels of economic advantage and disadvantage in at least some groups of adolescents. This disparity may be an intangible cost of social inequalities and is a matter of health justice. Our findings portray yet another unfair advantage that socioeconomic position and the related distribution of experiences and resources provide for more wealthy adolescents relative to their relatively deprived peers, providing impetus for thought and change.

CRediT authorship contribution statement

William Pickett: Writing – review & editing, Writing – original draft, Supervision, Project administration, Methodology, Investigation, Funding acquisition, Data curation, Conceptualization. **Nathan King:** Writing – review & editing, Writing – original draft, Methodology, Investigation, Formal analysis, Conceptualization. **Frank J Elgar:** Writing – review & editing, Methodology, Investigation, Conceptualization. **Valerie E. Michaelson:** Writing – review & editing, Writing – original draft, Project administration, Methodology, Investigation, Funding acquisition, Conceptualization.

Ethics statement

The work described has not been published previously.
The article is not under consideration for publication elsewhere.
The article's publication is approved by all authors and tacitly or explicitly by the responsible authorities where the work was carried out.

If accepted, the article will not be published elsewhere in the same form, in English or in any other language, including electronically, without the written consent of the copyright-holder.

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Declaration of interest

The authors have nothing to declare in terms of competing interests.

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Data availability

Data will be made available on request, provided that planned analyses meet the ethics requirements of the lead institutions (Queen's University, Brock University).

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