



## Absolute and relative family affluence and psychosomatic symptoms in adolescents



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### ABSTRACT

Previous research on the links between income inequality and health and socioeconomic differences in health suggests that relative differences in affluence impact health and well-being more than absolute affluence. This study explored whether self-reported psychosomatic symptoms in adolescents relate more closely to relative affluence (i.e., relative deprivation or rank affluence within regions or schools) than to absolute affluence. Data on family material assets and psychosomatic symptoms were collected from 48,523 adolescents in eight countries (Austria, Belgium, Canada, Norway, Scotland, Poland, Turkey, and Ukraine) as part of the 2009/10 Health Behaviour in School-aged Children study. Multilevel regression analyses of the data showed that relative deprivation (Yitzhaki Index, calculated in regions and in schools) and rank affluence (in regions) (1) related more closely to symptoms than absolute affluence, and (2) related to symptoms after differences in absolute affluence were held constant. However, differences in family material assets, whether they are measured in absolute or relative terms, account for a significant variation in adolescent psychosomatic symptoms. Conceptual and empirical issues relating to the use of material affluence indices to estimate socioeconomic position are discussed.

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### Introduction

The likelihood that young people are happy, healthy and doing well in school is significantly greater as social class rises. Research has found that adolescents at a lower socioeconomic status (SES) display more health compromising behaviours (e.g., physical inactivity, poor nutrition, smoking), report poorer physical health and lower life satisfaction, and exhibit more emotional problems (e.g., depression, anxiety), behavioural problems (e.g., inattentiveness, hyperactivity, aggression) and social skills deficits (Brooks-Gunn, Duncan, & Maritato, 1997; Chen & Paterson, 2006; Elgar, Trites, & Boyce, 2010). Other research has found that income inequality negatively relates to

adolescent health, as evidenced in international differences in child wellbeing, teenage pregnancy and school bullying (Elgar, Craig, Boyce, Morgan, & Vella-Zarb, 2009; Pickett & Wilkinson, 2007). However, the health consequences of relative deprivation (RD) and rank differences in affluence have not been thoroughly studied in this age group. The focus of this study was to examine absolute and relative differences in family material affluence with regard to their links to psychosomatic symptoms in adolescents.

Adolescence is a formative stage of development for coping resources, mental health and health habits, and SES differences in adolescent health are well documented (Chen, Matthews, & Boyce, 2002). Some research has found that the health consequences of family affluence wanes during the adolescent years as peer relationships supplant the family as a dominant reference group (West & Sweeting, 2004) and personal assets (e.g., spending money) become more important than family assets or income (Åberg Yngwe & Östberg, 2013). Still, SES appears to relate to

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mental and physical health in adolescents regardless of how their status is established, and salient peer influences on status suggests that their health relates not only to absolute affluence but to relative affluence as well.

Research on the mechanisms that underlie SES differences in adult health focuses on the direct consequences of material deprivation and the indirect psychosocial consequences of socioeconomic position (Adler & Snibbe, 2003; Diener, Sandvik, Seidlitz, & Diener, 1993; Mackenbach, 2012). According to the materialist hypothesis, SES differences in health arise from unequal distributions of material goods and services and financial resources that can be used to support health or fight and prevent illness. The psychosocial hypothesis posits that *feeling poor* in comparison to others elicits psychological stress, erodes social resources that help people to cope with stress, and thus contributes to stress-related illness (Marmot & Wilkinson, 2001; Wilkinson & Pickett, 2009). These hypotheses are not mutually exclusive, but only the psychosocial interpretation explains why two people with the same income may differ in health when one is surrounded by more affluent people and the other by less affluent people. What differentiates these individuals is not deprivation in absolute terms, such as inadequate nutrition or shelter, but rather feelings of deprivation from a desirable standard of living that is established by society.

These mechanisms have not been thoroughly investigated in adolescents. Although RD is conceptually and computationally related to the Gini coefficient of income inequality, and both RD and social rank are used to interpret contextual effects of income inequality on adolescent health (Wilkinson & Pickett, 2009), we are unaware of any previous studies that have directly compared absolute affluence, RD and rank affluence in terms of their associations with adolescent health. A recent review of studies of RD and health by Adjaye-Gbewonyo and Kawachi (2012) identified just one study that included data on child health, and it linked maternal RD to birth outcomes (Reagan, Salsberry, & Randall, 2007). By contrast, nine studies in the review found a significant association between RD and adult health, some after controlling individual differences in absolute income (e.g., Subramanyam, Kawachi, Berkman, & Subramanian, 2009). Another line of research on income rank and adult well-being has found that mental distress (i.e., depressive and anxiety symptoms, social difficulties) and happiness relate more closely to income rank within a reference group than to absolute income (Boyce, Brown, & Moore, 2010; Wood, Boyce, Moore, & Brown, 2012).

It is unclear, based on the adult literature, whether relative affluence impacts adolescent health more than absolute affluence. Both are likely to contribute to health inequalities, however the research carried out in modern welfare states appears to favour the psychosocial hypothesis. First, SES differences in mental and physical health are moderated by feelings of autonomy, isolation, stress and social support (Elgar et al., 2010; Marmot, 2004). Having many social connections and low stress helps protect the health of low-SES individuals. Second, the socioeconomic gradient in health exists across the full range of SES, even among relatively affluent groups (Chen & Paterson, 2006; Marmot, 2004). That the gradient does not disappear above a certain threshold suggests that status matters more to health than the availability of material goods and services. Third, among modern welfare states that have attained the basic material standards to support health of all citizens, the relation between affluence and health is stronger within these countries than between them (Easterlin, 1995; Wilkinson & Pickett, 2009). Fourth, socioeconomic gradients in health persist after differences in accessing health services and prevalence of health compromising behaviours are held constant (Marmot, 2004). It is difficult to explain these aspects of socioeconomic gradients in health in terms of the direct effects of material conditions alone.

These findings pose unanswered questions about how relative differences in affluence relate to adolescent health. Are adolescents, like adults, similarly affected by absolute and relative affluence? Does RD or affluence rank relate to health after differences in absolute affluence are held constant? The present study addressed these questions using international data on family material assets and psychosomatic symptoms in 11- to 15-year-olds. The data were collected in eight rich and middle-income countries. We used data on psychosomatic symptom frequency, rather than global assessments of health, to achieve the most objective measure of health possible (Loughnan et al., 2011). Our first objective was to compare three methods of operationalizing socioeconomic conditions with regard to their relation to symptoms: (1) *absolute affluence* was a summation of family material assets in the home; (2) *RD* was estimated using the Yitzhaki Index, which is the average difference between an individual's affluence and those with greater affluence in the same reference group (Yitzhaki, 1979); (3) *rank affluence* was the ordinal position of absolute affluence within a reference group (Boyce et al., 2010; Wood et al., 2012). We hypothesised that RD and rank affluence relate more closely to psychosomatic symptoms than absolute affluence. We also hypothesised, based on similar research on adults, that relative affluence relates to symptoms after differences in absolute affluence are taken into account.

## Method

### Participants

Data on family affluence and psychosomatic symptoms were collected in the 2009/10 Health Behaviours in School-aged Children (HBSC) study. The HBSC study is a school-based survey of nationally representative samples of 11-, 13-, and 15-year-olds in 39 countries in Europe and North America (Currie et al., 2012). Schools that represented the socioeconomic conditions of each participating country were recruited into the study. The HBSC study protocol specifies that samples submitted for international comparisons are sufficient to provide confidence intervals of  $\pm 3\%$  for representative estimates with sample design effects no more than 1.4 times greater than would be obtained from a simple random sample (Currie et al., 2012). Teachers or trained interviewers administered the survey in classroom settings. Student participation was voluntary. Each participating country obtained approval to conduct the survey from the ethics review board or equivalent regulatory body associated with the institution conducting each respective national survey.

We analysed data from eight countries (Table 1): Austria, Belgium (Flanders region), Canada, Norway, Poland, Scotland, Turkey, and Ukraine. Table 1 summarises the number of students, schools and regions per country. These countries were selected to represent high- and middle-income groups of countries with differing levels of absolute affluence. In 2011, their gross national income per capita ranged from \$3120 (Ukraine) to \$88,890 (Norway) US dollars (World Bank, 2012). We excluded individual cases with missing data on geocodes (region or school) or key variables (i.e., gender, age, family affluence and psychosomatic symptoms) and excluded schools with fewer than 10 student observations given our focus on relative differences within schools. These exclusion criteria reduced the sample by 7.7% to 48,523 students in 2166 schools, in 141 regions. The number of regions per country ranged from 2 (Norway) to 36 (Austria), number of schools ranged from 105 (Poland) to 434 (Canada) and number of students ranged from 3740 (Belgium-Flanders) to 14,394 (Canada). The sample was 48.97% male, 51.03% female and ranged in age from 10.50 to 16.50 years ( $M = 13.61$ ,  $SD = 1.63$ ).

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