



# The great recession, youth unemployment and inequalities in psychological health complaints in adolescents: a multilevel study in 31 countries

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## Abstract

**Objectives** Little is known about the impact of recessions on young people's socioeconomic inequalities in health. This study investigates the impact of the economic recession in terms of youth unemployment on socioeconomic inequalities in psychological health complaints among adolescents across Europe and North America.

**Methods** Data from the WHO collaborative 'Health Behaviour in School-aged Children' (HBSC) study were collected in 2005/06 ( $N = 160,830$ ) and 2009/10 ( $N = 166,590$ ) in 31 European and North American countries. Logistic multilevel models were used to assess the contribution of youth unemployment in 2009/10 (enduring recession) and the change in youth unemployment (2005–2010) to adolescent psychological health complaints and socioeconomic inequalities in complaints in 2009/10.

**Results** Youth unemployment during the recession is positively related to psychological health complaints, but not to inequalities in complaints. Changes in youth unemployment (2005–2010) were not associated with adolescents' psychological health complaints, whereas greater inequalities in complaints were found in countries with greater increases in youth unemployment.

**Conclusions** This study highlights the need to tackle the impact of increasing unemployment on adolescent health and health inequalities during economic recessions.

**Keywords** Subjective health · Health inequalities · Recession · Youth unemployment · Adolescence · Multilevel analysis

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## Introduction

The economic recession started in 2007 and continues to influence social determinants of health (Marmot et al. 2012) through changes in living and working conditions, increased unemployment, particularly youth unemployment (International Labour Office 2013; UNICEF 2014), and decreased national wealth and public social spending (Karanikolos et al. 2013). With regard to young people, studies have recently begun to examine the impact of the economic recession on their wellbeing and health. Exposures to stressful events, such as negative shocks to the household may have lasting effects on adolescent's mental health (McLoyd et al. 2009) and physical health (Evans and Kim 2007).

Young people depend strongly on socioeconomic living conditions within their families (Currie et al. 2008b; Starfield et al. 2002). Recessions are times of insecurity, particularly in terms of families' occupational and economic situation and regarding future prospects. Only recently, one study revealed that the absolute youth unemployment rate in 2010 was related to higher likelihoods of health complaints, whereas adult unemployment and relative change in youth and adult unemployment from 2007 to 2010 were not (Pfoertner et al. 2014).

Few studies have examined socioeconomic inequalities in the impact of the economic recession on health outcomes. The recession might have put young people's life opportunities and living conditions at risk. Disadvantaged adolescents have higher exposition to individual risk factors in contrast to their better-off peers (Bell and Blanchflower 2011; Gavrilovic and Marcus 2010; Harper et al. 2011; Lundberg and Wuermli 2012; Rajmil et al. 2014a, b). For instance, a study from Spain highlighted that health-related behaviours (e.g. eating habits, fast food consumption) and quality of life improved during the recent recession among adolescents younger than 15 years, whereas socioeconomic inequalities in their health and health behaviour increased (Rajmil et al. 2013).

Previous research has not focused on whether the recession may impact socioeconomic inequalities in psychological health among young people. We therefore extend the study by Pfoertner et al. (2014), focusing on the link between country-level youth unemployment rates and socioeconomic inequalities in young people's subjective health across 31 European and North American countries, using the Health Behaviour in School-aged Children (HBSC)-Surveys 2005/2006 and 2009/2010. In particular, we investigate (1) the role of the unemployment rates in 2010 for health inequalities, and (2) the impact of change in unemployment rates during the recession (2005–2010) on health inequalities.

According to the literature, there are different pathways through which economic recessions can have an impact on

young people's overall development, wellbeing and health (Hempel et al. 2012; Lundberg and Wuermli 2012; UNICEF 2014). First, recessions may be experienced directly by young people, for instance, by a change in personal expectations and aspirations. Expectations, vocational identity and personal goals are likely to change due to worsening labour market conditions, higher (youth) unemployment rates and perceived lower likelihoods of achieving those goals. Increasing demands and expectations to be well prepared for the labour market after secondary school are also likely to contribute to young people's psychological distress (Hempel et al. 2012; Lundberg and Wuermli 2012; UNICEF 2014). Second, recessions can indirectly affect young people's lives, for example, through the family in terms of increased parental stress, job loss or reduced family income (Hempel et al. 2012; Holmqvist and Natali 2014). Effects of (youth) unemployment on adolescents' psychological wellbeing and psychological health complaints may be mediated through pessimism, feelings of anxiety, stress and psychological worries about the current situation as well as the fear of future personal or parental unemployment (Lundberg and Wuermli 2012; Novo et al. 2001; UNICEF 2014; Urbanos-Garrido and Lopez-Valcarcel 2015).

In line with recent findings, it is therefore likely that adolescents living in countries with higher overall levels of youth unemployment will show a higher risk of psychological health complaints (hypothesis 1a). Further, because low family affluence poses added vulnerability (Currie et al. 2012), we expect to find that a high level of youth unemployment is associated with even greater risks of psychological health complaints among less affluent youth (hypothesis 1b). While youth unemployment increased in the majority of countries during the economic recession (UNICEF 2014), it is likely that this development intensified feelings of insecurity, anxiety and psychological distress, resulting in more psychological health complaints (hypothesis 2a). Further, the impact of increasing youth unemployment on psychological health complaints may be even worse—as a kind of shock—for young people who are less well-off (hypothesis 2b).

## Methods

### Data

Data were obtained from the Health Behaviour in School-aged Children (HBSC) studies in 2005/2006 and 2009/2010, a cross-national survey conducted in collaboration with the World Health Organization. The objective of the HBSC study was to investigate health, health behaviours and their social determinants among 11-, 13-

and 15-year-old adolescents (Currie et al. 2008b). Research groups in 41 countries in Europe, North America and Israel took part in the 2005/2006 and 2009/2010 surveys using a standardised questionnaire and protocol (Currie et al. 2009). Surveys were administered in school classrooms with a response rate at the class-level above 80 % in most countries. Detailed information on response rates and variations in response rates are reported elsewhere (Schnohr et al. 2015). Ethical approval was obtained for each national survey according to the national guidance and regulation at the time of data collection. The present analysis was based on 31 out of 41 countries as the study of Pfoertner et al. (HBSC 2005/2006:  $n = 160,830$  and HBSC 2009/2010:  $n = 166,590$ ). England, Wales and Scotland were combined to present the United Kingdom. French and Flemish regions of Belgium were also combined. Greenland, Iceland, Romania and Turkey were excluded from the analysis because information on the Gross Domestic Product and unemployment rates were not available. Missing values for the individual-level variables described were excluded from the analyses. Table 1 shows the sample size for each country and indicators used in the analyses.

## Indicators

### *Psychological health complaints*

The health outcome used in the analysis was weekly subjective health complaints (Ravens-Sieberer et al. 2008). Psychological health complaints were measured as part of the HBSC symptom check list (Currie et al. 2008b). Students were asked to indicate how often in the last 6 months they had experienced the following psychological symptoms: irritable or bad tempered, feeling nervous, difficulties in getting to sleep and feeling low as psychological health complaints. The response options were “almost daily”, “several times per week”, “almost every week”, “about once per month”, “rarely or never”. A summation of the four psychological health complaints indicated the number of at least weekly psychological health complaints (range 0–4 psychological health complaints several times per week). Lastly, this index was dichotomised (1 = two or more psychological health complaints at least weekly vs. 0 = less than two weekly psychological health complaints).

### *Socioeconomic position*

Socioeconomic position (SEP) was measured by the Family Affluence Scale (FAS) which contained four items (Currie et al. 2008a): “Does your family own a car, van, or truck?” (0 = no, 1 = yes, one, 2 = yes, two or more), “Do you have your own bedroom for yourself?” (0 = no, 1 = yes), “During the past 12 months, how many times

did you travel away on holiday with your family?” (0 = not at all, 1 = once, 2 = twice, 3 = more than twice), and “How many computers does your family own?” (0 = none, 1 = one, 2 = two, 3 = more than two). The scores of the answers were summed, ranging from low to high family affluence (range 0–9), and standardized to z-scores across countries to make SEP scores comparable. For a better interpretation we used three categories of SEP (high, medium and low) in the multilevel models (Currie et al. 2008a, b, 2009). The FAS has been validated and can be used as “an indicator of child material affluence” (Currie et al. 2008a).

### *Youth unemployment*

We focused on youth unemployment rates because previous studies found that they are more vulnerable to economic recessions than adult employment (Choudhry et al. 2010; Verick 2009). EUROSTAT provides data on unemployment among young people between 15 and 24 years. The youth unemployment rate refers to the number of persons who are unemployed as a percentage of the total number of employed and unemployed persons (International Labour Office 2013). In this study, we tested both, the absolute level of youth unemployment in 2009/2010 as well as the relative changes in youth unemployment (in percentages) before the advent of the economic recession (2005/2006) until 2009/2010.

### *Individual and country-level control variables*

We controlled differences in national wealth using national Gross Domestic Product (GDP) per capita in 2009/2010 (purchasing power parity (PPP), in US-Dollars) (<http://data.worldbank.org>). We controlled for individual differences in age (age groups: 11, 13 and 15 years; 11 years was the reference category) and gender (boys were the reference category) in all statistical models.

### *Statistical analysis*

Multilevel analysis was used as the data had a hierarchical or nested data structure. The level 1-units in the sample were individual students; the level 2-units were the 31 countries. Multilevel analysis is based on the assumption that both the regression constant (intercept) and the regression coefficients of the individual predictors (slope) may vary for individuals between contexts and be explained by country-level characteristics. By conducting random intercept models (Rabe-Hesketh and Skrondal 2012) we examined the extent to which the intercept of the outcome (psychological health complaints) differed among the 31 countries. We simultaneously considered country-

**Table 1** Description of data and sample (HBSC 2005/2006 and 2009/2010, 31 European and North American countries, OECD SOCX, World Bank data)

Country ( <i>N</i> = 31)	Sample		Macro-level indicators			Outcome		
			Youth unemployment (%)		National wealth	Two or more (at least weekly) psychological health complaints (%)		
	<i>N</i> 2005/2006	<i>N</i> 2009/2010	2009/2010	Relative change rate 2005/2006– 2009/2010	GDP per capita in constant prices and constant PPP (US\$) 2009/2010	2005/2006	2009/2010	Relative change rate 2005/2006– 2009/2010
Austria	4359	4638	8.9	−4.6	35,056	10.1	12.5	23.3
Belgium	7603	7085	20.8	2.5	32,648	19.6	18.2	−7.5
Canada	5470	13,787	15.4	33.4	35,897	22.2	21.7	−2.3
Croatia	4727	6095	26.5	−6.6	13,686	23.6	21.4	−9.2
Czech Republic	4568	4072	15.0	−4.6	23,369	26.1	29.6	13.3
Denmark	5225	3748	11.3	42.0	32,176	14.9	14.9	−0.6
Estonia	4260	4063	24.2	90.3	16,403	22.6	21.4	−5.3
Finland	4851	6267	19.8	7.4	30,881	18.8	17.7	−6.1
France	6761	5661	22.3	5.4	29,457	25.4	23.7	−7.0
Germany	6850	4718	10.6	−23.2	32,850	13.2	11.8	−10.4
Greece	3572	4637	26.9	9.0	24,923	35.0	31.9	−8.8
Hungary	3345	4638	24.3	29.0	16,821	24.3	21.2	−13.1
Ireland	4343	3922	21.6	145.8	35,762	17.2	20.5	18.9
Israel	4556	3776	14.9	−17.2	27,352	42.3	34.7	−17.9
Italy	3764	4572	24.8	13.1	26,894	34.9	33.0	−5.5
Latvia	3979	3934	29.3	117.6	17,261	26.9	23.3	−13.3
Lithuania	5377	5074	25.5	152.5	18,845	26.8	25.6	−4.3
Netherlands	4011	4198	7.6	−5.0	36,713	13.3	14.5	8.4
Norway	4301	4050	8.6	−6.2	46,964	17.4	19.3	10.9
Poland	5360	4029	20.5	−30.4	16,954	27.5	27.6	0.1
Portugal	3645	3781	24.2	20.6	21,578	15.0	16.5	10.0
Russia	7624	4579	20.4	31.6	13,834	25.7	24.6	−4.5
Slovakia	3359	4614	26.9	3.6	19,762	31.4	27.2	−13.5
Slovenia	4887	5232	12.9	−3.0	24,897	14.3	11.1	−22.4
Spain	8428	4778	34.7	86.4	26,976	22.2	22.9	3.3
Sweden	3918	6016	23.3	10.6	33,211	21.3	20.7	−2.8
Switzerland	4357	6291	6.4	−19.1	38,637	19.9	19.3	−3.3
Ukraine	4594	5353	18.0	25.3	2760	28.8	26.4	−8.1
Macedonia	5080	3524	56.3	−6.2	4438	24.6	22.2	−9.8
United Kingdom	13,935	13,677	17.9	30.7	32,625	20.0	20.1	0.1
USA	3721	5781	16.3	51.1	43,529	27.9	22.0	−21.2
Total	160.830	166.590	20.0	25.1	26,963	22.6	21.6	−4.4

Missing values for the individual-level variables described were excluded from the analyses

USA United States of America, *OECD* Organization for Economic Cooperation and Development, *SOCX* Social Expenditure Database, *GDP* Gross Domestic Product

level indicators of youth unemployment as well as change rate in youth unemployment in the model to explain the cross-country variation in psychological health complaints and in the socioeconomic inequalities in psychological complaints.

The individual- and country-level determinants were included in the models using a stepwise approach. First, an empty model (Model 1) tested the Intraclass Correlation Coefficient (ICC). The ICC represents the proportion of variance on latent country effects, indicating the variance in

**Table 2** Pairwise correlations between country-level indicators (31 European and North American countries)

	Youth unemployment 2009/2010	Change rate in youth unemployment (2005/2006–2009/2010)	National wealth (GDP per capita, 2009/2010)
Youth unemployment 2009/2010	1		
Change rate in youth unemployment	0.26	1	
National wealth (GDP per capita, 2009/2010)	<b>−0.63*</b>	−0.09	1

\* Significant at  $p < 0.001$ 

the outcome attributed to country differences. In Model 2, only individual-level variables were entered. Model 3 included the absolute and change rate of youth unemployment, whereas in Model 4 we considered cross-level interaction terms between family affluence and both youth unemployment indicators, respectively. Model 5 then separately controls for national wealth (GDP per capita) as national wealth and absolute youth unemployment in 2009/2010 were moderately and positively correlated (Table 2). The statistical analyses were conducted using the software Stata 12.1 (StataCorp LP, College Station, TX).

## Results

Table 2 shows the pairwise correlations among country-level indicators of youth unemployment rates, change rates in youth unemployment and national wealth. National wealth negatively correlated with the absolute youth unemployment rate in 2009/2010 ( $r = -0.63$ ,  $p < 0.001$ ), highlighting that wealthier countries had less youth unemployment. However, the change rate in youth unemployment did not correlate with national wealth.

As shown in Table 1, 22.6 % of adolescents reported more than two psychological health complaints at least weekly in 2009/2010. The prevalence rates of psychological health complaints in 2009/2010 were lowest in Austria (12.5 %) and the Netherlands (13.3 %) (Table 1), whereas highest in Israel (34.7 %) and Italy (33.0 %). Between 2005/2006 and 2009/2010, a slight decrease in psychological health complaints was found in all European countries (mean of  $-4.4$  %). Adolescents in Slovenia showed the highest decrease in psychological health complaints ( $-22.4$  %), whereas Austria ( $+23.3$  %) had the highest increase.

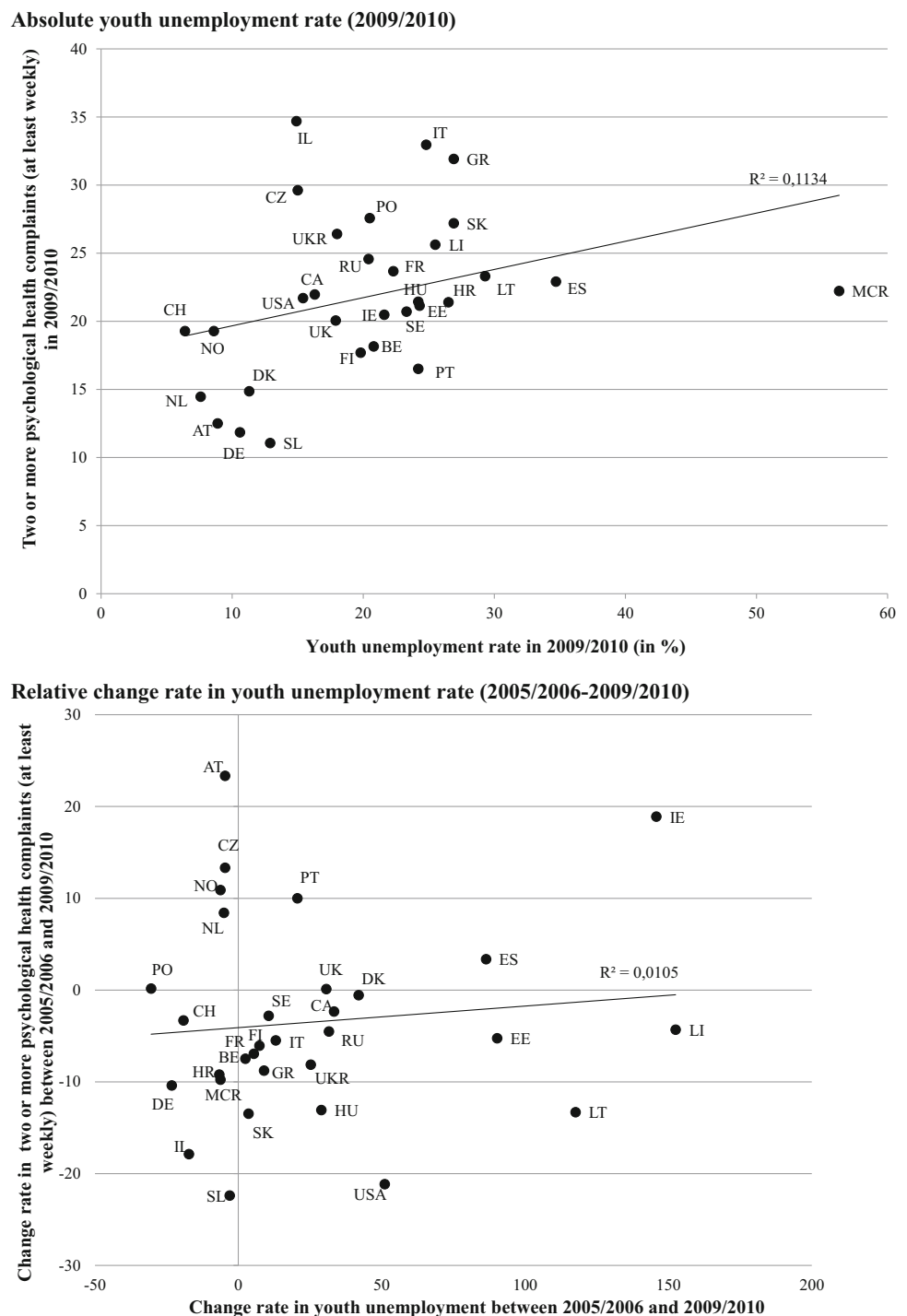
With regard to youth unemployment rates in 2009/2010 (Table 1), the lowest rates were found in Switzerland, the Netherlands, Norway and Austria (6.4–8.9 %). In contrast, Macedonia, Spain and Latvia revealed the highest youth unemployment rates in 2009/2010 (29.3–56.3 %). Many European and North American countries faced tremendous increases in youth unemployment since the start of the

economic recession (OECD 2012). This trend was observed in the positive relative change rates in youth unemployment between 2005/2006 and 2009/2010, indicating that youth unemployment increased in the majority of countries ( $+25.1$  %). The highest relative increase was found in Lithuania ( $+152.5$  %) and Ireland ( $+145.8$  %), whereas the highest decrease in the relative change rate in youth unemployment (2005/2006–2009/2010) was found in Poland ( $-30.4$  %) and Germany ( $-23.2$  %). Figure 1 shows weak correlations between the absolute youth unemployment rate in 2005/2006 and the prevalence of two or more psychological health complaints in 2005/2006 per country as well as between the relative change rate in youth unemployment (2005/2006–2009/2010) and the change rate in psychological health complaints (2005/2006–2009/2010) per country.

Table 3 presents the findings from the logistic multilevel models on the associations between the absolute unemployment rate in 2009/2010 as well as change rate in youth unemployment (2005/2006–2009/2010), psychological health complaints and inequalities in psychological health complaints among boys and girls, respectively. The null model (Model 1) shows the variance in psychological health complaints between countries (ICC = 3.6 %). Model 2 controls for individual variables and shows that the likelihood of two or more weekly psychological health complaints increased with age, for females and lower SEP. These associations were not attenuated when country-level indicators were included in Models 2–5. Model 3 considered the absolute youth unemployment rate as well as the relative change rate in youth unemployment (2005/2006–2009/2010). The absolute rate of youth unemployment in 2009/2010 significantly related to psychological health complaints (OR 1.014, 95 % CI 1.00–1.03), confirming the descriptive results. However, the relative change rate (increase) in youth unemployment (2005/2006–2009/2010) did not relate to the outcome.

With regard to inequalities in psychological health complaints, cross-level interaction terms between family affluence and unemployment were tested in Models 4 and 5. As shown in Model 4, the impact of absolute rate of unemployment in 2009/2010 did not differ among family

**Fig. 1** Youth unemployment and psychological health complaints (in %) across 31 European and North American countries (HBSC 2005–2006 and 2009/2010, 31 European and North American countries). *HBSC* Health Behaviour in School-aged Children-Study. Labels for countries: Austria (AT), Belgium (BE), Canada (CA), Croatia (HR), Czech Republic (CZ), Denmark (DK), Estonia (EE), Finland (FI), France (FR), Germany (DE), Greece (GR), Hungary (HU), Ireland (IE), Israel (IL), Italy (IT), Latvia (LV), Lithuania (LT), Netherlands (NL), Norway (NO), Poland (PO), Portugal (PT), Russia (RU), Slovakia (SK), Slovenia (SI), Spain (ES), Sweden (SE), Switzerland (CH), Ukraine (UKR), Macedonia (MCR), the United Kingdom (UK) and the United States (USA)



affluence groups. In contrast, results in Models 4 and 5 show that adolescents living in countries with higher increases in youth unemployment rates (2005/2006–2009/2010) revealed higher likelihoods of reporting two or more (at least weekly) psychological health complaints for medium SEP (OR 1.112, 95 % CI 1.08–1.14) and low SEP groups (OR 1.350, 95 % CI 1.31–1.39) compared to their high SEP peers. These findings indicate greater inequalities

in psychological health complaints for adolescents in countries where youth unemployment increased. This association did not change when national wealth was considered (Model 5). National wealth did not significantly relate to psychological health complaints. Figure 2 shows that increases in youth unemployment were associated with worsening health in low SEP adolescents and improving health in high SEP adolescents.

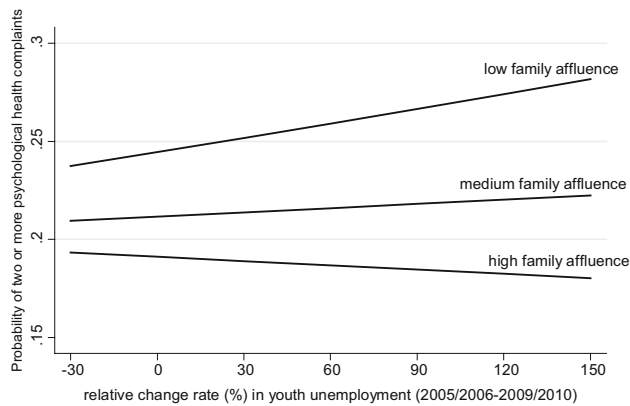
**Table 3** Logistic multilevel results for the association between country-level youth unemployment, change rate in youth unemployment and psychological health complaints, HBSC 2009/2010 (31 European and North American countries, 2009/2010)

	Empty model (M1)	Individual variables (M2)	Macro-level variables (M3)	Model with cross- level interactions (M4)	Model with cross-level interactions (M5) + GDP
	OR (95 % CI)	OR (95 % CI)	OR (95 % CI)	OR (95 % CI)	OR (95 % CI)
<b>Individual variables</b>					
Sex (Ref.: boys)		1	1	1	1
Girls		1.732*** (1.69–1.77)	1.732*** (1.69–1.77)	1.733*** (1.69–1.78)	1.733*** (1.69–1.78)
Age (Ref.: 11 years)		1.000	1.000	1.000	1.000
13 years		1.249*** (1.21–1.29)	1.249*** (1.21–1.29)	1.249*** (1.21–1.29)	1.249*** (1.21–1.29)
15 years		1.428*** (1.39–1.47)	1.428*** (1.39–1.47)	1.429*** (1.39–1.47)	1.429*** (1.39–1.47)
Family affluence (Ref.: high)		1.000	1.000	1.000	1.000
Medium		1.112*** (1.08–1.14)	1.112*** (1.08–1.14)	1.120*** (1.09–1.15)	1.120*** (1.09–1.15)
Low		1.350*** (1.31–1.39)	1.350*** (1.31–1.39)	1.350*** (1.31–1.39)	1.350*** (1.31–1.39)
<b>Macro-level variables</b>					
Youth unemployment rate (2009/2010)			<b>1.014* (1.00–1.03)</b>	<b>1.016* (1.00–1.03)</b>	1.010 (0.99–1.04)
Relative change in youth unemployment (2005/ 2006–2009/2010)			1.001 (0.99–1.00)	0.999 (0.99–1.00)	0.999 (0.99–1.00)
<b>Cross-level interactions</b>					
Youth unemployment rate (2009/2010) × high FAS (Ref.)				1.000	1.000
×Medium FAS				0.996 (0.99–1.00)	0.996 (0.99–1.01)
×Low FAS				0.998 (0.99–1.00)	0.998 (0.99–1.01)
Relative change in youth unemployment (2005/ 2006–2009/2010)					
×High FAS (Ref.)				1.000	1.000
×Medium FAS				<b>1.001*** (1.00–1.01)</b>	<b>1.001*** (1.00–1.01)</b>
×Low FAS				<b>1.002*** (1.00–1.01)</b>	<b>1.002*** (1.00–1.01)</b>
National wealth in 2009/2010 (GDP per capita <sup>#</sup> )					0.999 (0.99–1.00)
Constant	0.270*** (0.24–0.31)	0.145*** (0.13–0.17)	0.141*** (0.12–0.16)	0.140*** (0.12–0.16)	0.140*** (0.12–0.16)
ICC (country-level)	0.036 = 3.6 %	0.0375 = 3.75 %	0.0328 = 3.28 %	0.0327 = 3.27 %	0.0317 = 3.17 %
N (individuals)	166,590	166,590	166,590	166,590	166,590
N (countries)	31	31	31	31	31

Country-level indicators are centered on the Grand-Mean

Ref reference category

\*  $p < 0.05$ , \*\*  $p < 0.01$ , \*\*\*  $p < 0.001$ <sup>#</sup> GDP per capita was measured per capita in constant prices and constant purchasing power parity, in US\$ (Source: OECD SOCX and World Bank Data Bank)



**Fig. 2** Predicted probabilities for psychological health complaints and change in youth unemployment stratified by family affluence (HBSC 2009/2010, 31 European and North American countries,  $N = 166,590$ ). HBSC Health Behaviour in School-aged Children-Study

## Discussion

### Summary of findings

This study extended a prior study (Pfoertner et al. 2014) by examining whether youth unemployment also relates to socioeconomic inequalities in psychological health complaints among adolescents across 31 countries. Despite sharp increases in youth unemployment during the recent recession, the prevalence of psychological complaints declined in most countries. Our findings further revealed that the absolute rate of youth unemployment in 2009/2010 related to more psychological health complaints (hypothesis 1a confirmed), whereas the relative increase in unemployment rate between 2005/2006 and 2009/2010 (enduring recession) did not (hypothesis 1b not confirmed).

With regard to the link between unemployment and socioeconomic inequalities in health, the impact of the absolute level of youth unemployment in 2009/2010 did not differ among family affluence groups (hypothesis 2a not confirmed), when national wealth was included in the models. In contrast, the association between increases in youth unemployment (2005/2006–2009/2010) and psychological health complaints varied among young people according to SEP (hypothesis 2b confirmed). This indicates that an increase in youth unemployment during the recession corresponded to larger inequalities in psychological health complaints between socioeconomic groups, with worse health outcomes in low SEP adolescents.

### Interpretation

Since the start of the economic recession in 2007, research on the impact of the economic recession on young people's health and socioeconomic inequalities in health from a

cross-national perspective is still scarce. Thus, comparing and interpreting our findings with prior results is a challenge as previous studies focused on adult health, single-countries or individual-level associations rather than country-level outcomes of the recession as determinants of adolescent health and health inequalities.

Previous evidence suggests that socioeconomic inequalities widened during economic recessions in many countries and that detrimental health effects were greater among disadvantaged groups during times of economic changes and recessions (Kondo et al. 2008; Marmot et al. 2012). Regarding young people, the Catalan Health Survey provided the first evidence that children's health-related behaviours (e.g. eating habits, fast food consumption) and health-related quality of life improved between 2006 (before the recession) and 2010–2012 (enduring recession), whereas socioeconomic inequalities in young people's obesity, mental health and health-related quality of life increased according to the level of parental education (Rajmil et al. 2013). A study of young people from the US revealed that self-rated health and mental health declined, particularly among adolescents in low-income families between 2001 and 2010 (Cui and Zack 2013). Our results indicate that increases in youth unemployment (2005/2006–2009/2010) are more crucial for socioeconomic inequalities in young people's psychological health complaints, whereas the absolute youth unemployment rate in 2009/2010 was not related to inequalities in psychological complaints after controlling for national wealth. This finding may be explained by economic insecurity among young people and their families from lower socioeconomic groups when youth unemployment increased since the beginning of the economic recession. In this context, increasing youth unemployment rates may create anxiety, particularly for those young people from lower socioeconomic backgrounds, resulting in higher levels of stress and concerns about the future, which is likely to result in higher levels of psychological health complaints among those adolescents. Those people are highly vulnerable to precarious (parental) employment and economic situations as well as are more likely to suffer from macro-economic changes (Rajmil et al. 2014b; UNICEF 2014).

Further, prior cross-national studies that explored the role of the macro-economic outcomes of the economic recession (e.g. cuts in social benefits or rising unemployment rates) for health inequalities among young people are still warranted. Overall, there is scarce evidence on the effects of active labour market policy programs on youths or participation in those youth programs on mental and psychological health (Strandh et al. 2015). Drawing on evidence from previous studies, it seems that countries with active labour market programmes that retain and reintegrate young workers may protect population health during



economic recessions (Stuckler et al. 2009; Catalano et al. 2011). Examples from Sweden showed, for instance, that active labour market policies tailored for young people can reduce the short- and long-term health costs of youth unemployment (Strandh et al. 2015; Reine et al. 2008). Different reports and studies further concluded that active labour market programs in OECD countries can prevent some adverse effects of economic downturns and that providing services in terms of care and cash benefits for those in need, particularly for young people and their families, is necessary to mitigate the negative effects of the economic recession on youth development and health (Chzhen 2014; Coutts et al. 2014; Gavrilovic and Marcus 2010; Lundberg and Wuermli 2012; Richardson 2010; UNICEF 2014). However, with so few studies on active labour market programs for youths and its impacts on young people's health and wellbeing, there is an urgent need for further research, especially longitudinal studies, in the context of economic recessions.

The HBSC study presents a unique opportunity to analyse cross-national patterns of health and health inequalities among young people. The strengths of this study include the use of a large cross-national dataset and standardized data collection. However, there were methodological issues that should be considered. One limitation was the application of self-report measures of health, which work differently according to country, culture and SEP. However, Ravens-Sieberer et al. (2008) found that the HBSC symptom checklist did not differ among countries in terms of interpretation or SEP. It should also be acknowledged that the FAS measured only one dimension of SEP. Previous studies have shown that the FAS can be applied as a proxy for individual SEP (Holstein et al. 2009; Currie et al. 2008a). Further, students' assessment of FAS items corresponded with parents' responses and was correlated with parents' occupational status (Andersen et al. 2008). Additionally, FAS was closely related to national income at the aggregated level (Boyce et al. 2006). Further, the cut-off-point of our dependent variable could have biased our results. Therefore, we tested whether our results differed using different criteria in the dependent variable (i.e. "one or more" and "three or more" psychological health complaints at least weekly). However, the associations between those outcomes and both youth unemployment rates, respectively, displayed a similar pattern as in our models using "two or more psychological health complaints at least weekly." As Macedonia is an outlier in terms of the level of youth unemployment rates (see Fig. 1), we conducted further sensitivity analyses, by excluding Macedonia from our analyses. However, the associations did not differ, indicating that our findings are quite robust. Another limitation was the short duration of the study by analysing the impact

of youth unemployment rates in 2009/2010 and the relative increase, decrease or stagnation in youth unemployment between 2005/2006 and 2009/2010 on adolescent health and health inequalities. Thus, future cross-national studies are required that unravel the impact of the economic recession and the range of policy responses that have been implemented to assess their role for young people's health and health inequalities during times of economic recessions.

## Conclusion

This is the first study to examine the link between countries' youth unemployment rates and socioeconomic inequalities in young people's health within a cross-national framework. Our findings showed that the absolute level of youth unemployment in 2009/2010 was not associated with adolescent psychological health complaints and inequalities in psychological health complaints. In contrast, the relative increase in youth unemployment during the economic recession was associated with greater inequalities in psychological health complaints between SEP groups. These results highlight the need for action to address the health consequences of the economic recession in the short to medium term, particularly for young people with low social background. In the long run, it remains to be seen whether long-term effects of the economic recession will continue to impact young people's health and socioeconomic inequalities in health across European and North American countries (Institute of Health Equity for the London Health Inequalities Network 2012).

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