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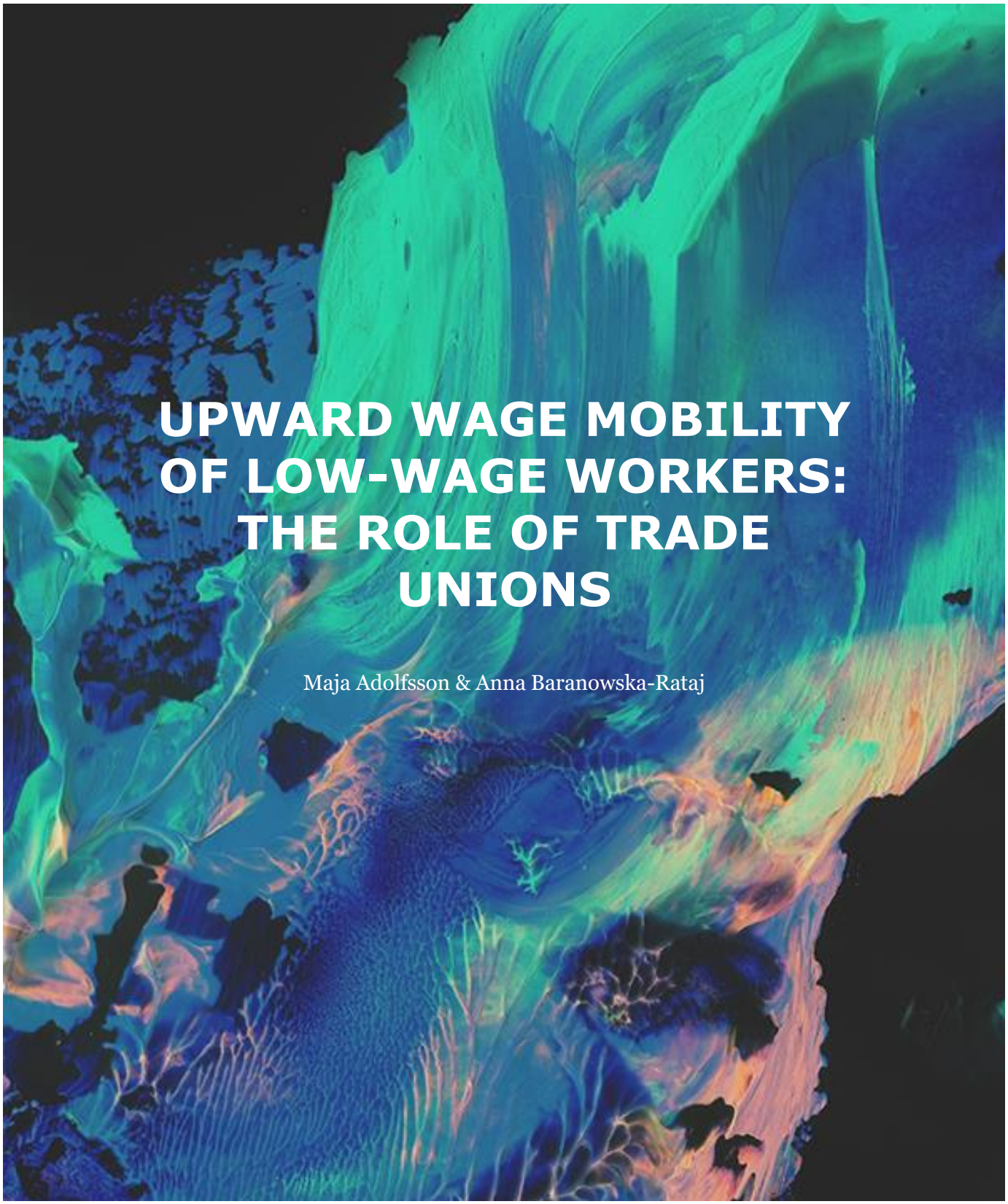

UPWARD WAGE MOBILITY OF LOW-WAGE WORKERS: THE ROLE OF TRADE UNIONS

Maja Adolfsson & Anna Baranowska-Rataj

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UMEÅ UNIVERSITET

Centrum för regionalvetenskap (CERUM) 901 87 Umeå www.umu.se

1. Introduction

Low-wage jobs constitute a substantial proportion of all jobs. According to the most recent OECD estimates, 15.1% of employees earn less than two-thirds of the national median wage (OECD 2020). The incidence of low-wage employment raises many concerns, both within academia and among policymakers. In most countries, more than half of low-wage workers remain in low-wage jobs between two consecutive years (Clark and Kanellopoulos, 2013). This suggests that from a life course perspective, starting a working career in a low-wage job may be a dead-end. However, low-wage persistence varies substantially across countries (Clark and Kanellopoulos, 2013; Mason and Salverda, 2010), which calls for identifying the institutional factors that facilitate transitions to better-paid jobs.

While there are different labour market institutions that influence the situation of low-wage workers, trade unions are central because they engage in dialogue with the government and political parties to influence labour market policies and regulations (Rueda, 2007). Specifically, trade unions contribute to strengthen the bargaining power of labour, improve working conditions, increase real wages and reduce income inequality (Kollmeyer, 2017, 2018). In addition to organizing labour and negotiating wages, trade unions can affect different aspects of job quality, such as opportunities for training (Booth et al., 2003), job autonomy and job security (Esser and Olsen, 2012), and opportunities to work full-time (Schneider and Reich, 2014). Having access to training and better opportunities to acquire work experience are crucial determinants of upward wage mobility, particularly so

for low-wage workers who need such support more than other labour market groups. Thus, the pressure to improve these working conditions may have a positive impact on low-wage workers' chances of moving up the wage ladder.

This study provides new evidence on the role of trade unions in the upward mobility of low-wage workers in Europe. We make several contributions to the literature. First, previous research on low-wage employment examined whether low-wage jobs are stepping stones to better paid employment or dead-ends and how these processes may be confounded by the unobserved differences between workers. We extend this literature by examining *when* – i.e., under what institutional conditions – low-wage workers have better opportunities for upward wage mobility. In this respect, drawing on the power resource approach (Korpi, 1983, 2006; Stephens, 1979), which highlights the role of the distribution of power resources among key labour market actors, i.e., workers and employers, we focus on the role of trade unions.

Second, we carry out a systematic analysis across a large number of countries, taking advantage of comparative micro-data from European Union Statistics on Income and Living Conditions (EU-SILC). Hence, unlike in country-specific studies, our results are generalizable to a broad number of societal contexts. We use multilevel modelling techniques to assess the role of country-level union density, while controlling for differences in the individual characteristics of low-wage workers across countries.

Third, since EU-SILC data provide repeated observations for workers, instead of looking at the contemporaneous risk of receiving a low pay, we have the possibility to examine whether low-wage workers in countries with stronger unions have better chances of climbing up the wage ladder. This is a step forward compared to studies based on cross-sectional data, which cannot disentangle whether high risks of low-wage employment result from a growing demand for low-paid jobs or from limited opportunities of low-wage workers for upward wage mobility. Understanding the determinants of the latter mechanism is important both from research- and policy-related perspective. Examining how workers can overcome an initial disadvantage and go ahead in their careers contributes to one of the core debates in the literature on labour market inequalities. From policymakers' point of view, curbing the demand for low-paid jobs may be challenging as this demand is largely driven by macroeconomic and structural forces (Brülle et al., 2019). Compared to such goal, establishing institutions that support upward wage mobility among the most vulnerable groups of workers may be a more feasible part of the policy agenda.

Finally, we examine the effects of trade unions for different labour market groups that have relatively limited bargaining power, such as women, as well as younger and less educated workers. Hence, this study provides evidence whether the effects of trade unions are universal, or if they support some labour market groups more than others. Sociological research has long recognized the need to go beyond assessments of whether the effects of institutions and policies are positive "for an average worker", and to examine how these effects vary across population subgroups (Morgan and Winship,

2012). In general, improving working conditions for all the workers is one of the central goals of trade unions. However, as trade unions became increasingly dependent on financial contributions from membership fees (Lyhne Ibsen and Tapia, 2017; Pedersini, 2010), this pressure may have led to prioritising certain groups of workers. Indeed, some studies pointed to the need of trade unions to offer better support for the most vulnerable labour market groups (Hyman, 1999; Simms, 2017). Hence, this study addresses an important question, i.e., whether there is room for improvement of trade unions' influence for the most disadvantaged workers.

2. Theory and hypotheses

2.1 The power resource approach

The power resource approach (Korpi, 1983, 2006; Stephens, 1979) suggests that the distribution of power resources among different labour market actors shapes the allocation of economic resources (Brady et al., 2013). Due to their control of economic assets, employers have the power to determine the wages and the working conditions of workers (Kollmeyer, 2017). In response to this power, workers can "bond together, form organizations, and politically mobilize in elections and workplaces"; i.e., they can form trade unions (Brady et al., 2013: 875). Accordingly, trade unions are important labour market institutions that can help to redress the power imbalances between workers and employers.

Trade unions influence upward wage mobility at the national level, as they are involved in industrial relations and can influence political parties.

Because of this, trade unions negotiate with the government about labour market policies and regulations (Kollmeyer, 2017; Rueda, 2007). This is done through different mechanisms. First, trade unions can trigger wage-setting processes that improve workers' chances of getting higher pay. For instance, unions can negotiate wage increases for unionised workers through collective agreements (Simms, 2017). The positive impact of unions on wages can have a spill-over effect that influences non-unionised firms, as these employers may raise wages to avoid unionisation in their workforce. Union wage agreements can also be extended to non-unionised workers through public policy (Western and Rosenfeld, 2011). Trade unions can influence social policy, for instance, by promoting higher minimum wages or "pacts for employment and competitiveness" (Glassner and Keune, 2012: 352). Additionally, unions can shape social and cultural norms of fairness and equal pay (Gautié, 2012), and act as an equaliser by reducing earnings inequality at the national level (Western and Rosenfeld, 2011), which may result in better opportunities for upward wage mobility.

Second, unions can have an indirect effect on wages by improving various aspects of working conditions. Unions can, for instance, improve job security by opposing insecure working arrangements (Kalleberg, 2003), and enforcing various barriers to layoffs (Morgan et al., 2001). Also, unions can influence organisational changes by customising labour demand to the skills of the current employees, thereby forcing employers to recruit internally (Streeck, 2005). Furthermore, unions can increase employees' access to training (Booth et al., 2003) and job autonomy (Esser and Olsen, 2012).

Greater job stability, opportunities for upgrading the skills and internal career path opportunities tend to promote upward wage mobility.

In line with the arguments outlined above, we expect to find that upward wage mobility among low-wage workers will be greater in countries with higher trade union density *(Hypothesis 1)*.

2.2 Heterogeneous effects

Some influential theories have questioned the idea that trade unions improve upward mobility universally for all groups of workers, and highlighted the growing divide between labour market insiders and outsiders (Emmenegger et al., 2012; Palier and Thelen, 2010). This line of argumentation was inspired by the labour market segmentation theory (Doeringer and Piore, 1971). According to this literature, the labour market consists of the primary and the secondary segment. As compared to the primary segment, jobs in the secondary segment offer lower wages, limited job autonomy and training opportunities, higher levels of insecurity, and limited career opportunities. As the work experience in the secondary segment does not augment knowledge and skills across a working career, the opportunities to move from the secondary to the primary segment are limited.

Trade unions have, in this strand of literature, been viewed as organisations that seek to improve wages and working conditions of their members who are overrepresented in the primary segment (Palier and Thelen, 2010; Rueda, 2007). Historically, trade unions have followed the logic of supporting those groups of workers, who have the highest probability of

continuous employment (Gumbrell-McCormick, 2011). This tendency was further strengthened when trade unions became increasingly dependent on financial contributions from membership fees (Lyhne Ibsen and Tapia, 2017; Pedersini, 2010). Because of this, trade unions face conflicting choices, either (1) to prioritize their core groups of members in the insider segment, or (2) striving for an inclusive approach by representing the interests of the whole workforce (Freeman and Medoff, 1984; Rueda, 2007). Recent literature on trade union revitalization shows support for the latter, that trade unions increasingly work to represent the whole workforce (Benassi and Dorigatti, 2015; Simms et al., 2018; Tapia and Turner, 2018). Despite this, their actions may not benefit all workers to the same extent. For instance, trade unions have faced more obstacles to establish collective bargaining procedures or representation rights in typical low-skill occupations, workplaces and industries, for example, in catering, hospitality, sales, or the care sector (Tapia and Turner, 2018), that tend to employ more women, younger and less experienced and ethnically diverse workforce.

Varying effects of trade union power across population subgroups can also be understood from the perspective of the social custom theory, which argues that there needs to be a critical mass of 'the intensity and quality of interaction among workers, and on their beliefs or opinions about the union and union membership' (Visser, 2003: 408). For workers with weaker labour market attachment, such as youth, less educated workers, women or immigrants, opportunities for such interactions are more restricted. This may be one factor explaining why vulnerable labour market groups that are relatively more in need of trade unions' support, tend to have less knowledge

of trade unions and as a result their needs and interests are not always communicated to trade unions. While these workers might be active in different organizations and movements, they are not directly involved in trade unions per se (Tapia and Turner, 2018), and hence might receive less attention in policy-related dialogue (Biegert, 2019; Palier and Thelen, 2010).

Summing up, despite the general interest in improving working conditions for all workers and the documented positive impact of trade unions on non-unionized but otherwise similar workers (VanHeuvelen, 2018), the benefits from union density may be heterogeneous. In line with these arguments, we formulate a hypothesis that the benefits from trade unions for upward wage mobility vary among different groups of low-wage workers. We expect to find that for vulnerable labour market groups such as women, younger or less educated workers, strong trade unions foster upward wage mobility to a lesser degree *(Hypothesis 2)*.

3. Previous research

While a large body of research has examined workers' chances of escaping low-wage work depending on their individual characteristics in country-specific contexts, to the best of our knowledge, there is only one study that has taken a cross-country perspective. Clark and Kanellopoulos (2013) studied low-pay persistence across 12 European countries, and found evidence for the dead-end effect of low-wage work across all countries. According to their results, the relationship between union density and low-pay persistence was not statistically significant. However, the small number

of countries analysed may have limited the statistical power to detect the relationships of interest.

Other comparative studies on low-wage employment took a cross-sectional approach (Giesselmann, 2014; Lohmann, 2009). These studies provided insights into how the probability of low-wage employment differs across countries with varying institutional settings, albeit reaching contradictory conclusions. Since these studies did not examine the chances of upward wage mobility, we still need to know whether the positive impact of trade unions stems from improving chances to escape low-wage employment or if it results from the reduced numbers of low-wage jobs that are offered on the European labour markets. In a related study, Brady et al. (2013) carried out analyses drawing on variation in the levels of unionization across different states in the US. The findings showed that state-level unionization reduces the probability of working poverty. Since Brady et al. (2013) focused on the US, the question remains how the findings relate to other societal contexts, especially in the light of mixed results from previous research carried out for Europe.

4. Data and methods

We employ multilevel models using panel data from the EU-SILC database, which covers 29 European countries and provides information about individual labour market transitions and earnings. Examining upward wage mobility requires longitudinal data with at least two time points of observation. The EU-SILC has a rotational panel component in which each

individual is observed for up to four years[1]. Because the EU-SILC has repeated observations for workers, the data can be used to assess whether low-wage workers experienced upward wage mobility in the next year, or if they remained in low-wage employment. Maitre et al. (2012) highlighted that data from the EU-SILC can play a central role in developing comparative analyses of low-wage employment. While the use of EU-SILC in studies on labour market transitions and income dynamics has increased recently (see for instance, Bachmann et al., 2016; Baranowska-Rataj and Strandh, 2021; Bünning and Pollmann-Schult, 2016; Dotti Sani, 2015; Klesment and Van Bavel, 2017; Polin and Raitano, 2014), to the best of our knowledge, this dataset has not been used for examining upward wage mobility among low-wage workers in an international perspective.

While the EU-SILC includes identification numbers that track individuals across subsequent survey waves, it uses a rotational method which implies that a new sample of people is introduced each year to replace roughly 25 per cent of the existing panel (Verma and Betti, 2010). The personal identification numbers are reused when a rotational panel finishes, and a new panel subsample is introduced. To avoid duplicates, we constructed our sample by selecting three non-overlapping panels following individuals in 2004-2007, 2008-2011, and 2012-2015[2]. These panels correspond to the

[1] Exceptions are France, Norway, and Luxembourg that have longer panels. Some individuals have participated in all four survey years, but due to the data collection procedures and attrition, many respondents provide observations in only two or three waves.

[2] A similar approach has been adopted in previous research, see for instance (Baranowska-Rataj and Strandh, 2021; Klesment and Van Bavel, 2017). It is also possible to solve the problem of re-used personal identification numbers using the method developed by Borst (2018), which maximises the length of the panel but drops some of the countries. Given that multilevel modelling requires large number of countries, we prefer the approach of building a cumulative sample which does not require dropping countries from our dataset.

observational time window for the macro-level indicators listed below[3]. We restricted the sample to individuals aged 18-60, and our sample size is 50,727 individuals.[4]

Our key dependent variable is constructed in two steps. First, we identify low-wage workers within the total workforce. Second, we code whether the wages of these low-wage workers moved above the low-wage threshold in a given year (coded 1) or if workers remained in low-wage employment (which is coded 0). Low-wage employment is defined as having earnings below two-thirds of the national median wage, which corresponds to the definition of low-wage employment used in international comparisons (OECD, 2020). Earnings are measured based on the information on gross annual income from paid work in euros available in the EU-SILC. Many workers with low annual earnings may have experienced career breaks or worked part-time. Therefore, we have derived a measure of the number of months spent out of paid work, as well as of the number of months spent in part-time work, based on calendar data in EU-SILC. Then, we divide the annual income by the number of months in paid work and adjust this measure so that it reflects an hourly wage based on information on the number of hours usually worked per week. We identified the individuals who were earning two-thirds of the country- and the year-specific median hourly wage or less, and classified

[3] While more recent EU-SILC waves offer the possibility to add another panel, some of the key indicators are not available for the most recent years, which restricts the opportunities to further increase our sample.

[4] The countries in our sample include Austria, Belgium, Bulgaria, Cyprus, the Czech Republic, Denmark, Estonia, Finland, France, Greece, Hungary, Ireland, Iceland, Italy, Latvia, Luxembourg, Lithuania, Malta, the Netherlands, Norway, Poland, Portugal, Romania, Sweden, Slovenia, Slovakia, Spain, Switzerland, and the UK. Germany is included in the cross-sectional data from the EU-SILC, but is excluded from the longitudinal dataset.

them as low-wage workers. We then followed these workers over the subsequent years to find out whether they moved above this threshold.

Our independent variables include the following: age categories (distinguishing between the following groups: 18-34, 35-49, and 50-60), sex, educational attainment (distinguishing between workers with elementary, secondary, and post-secondary or tertiary education), and experience (based on responses to the question about the total number of years spent in work). We also control for occupational categories, measured with dummies for one-digit ISCO groups. To control for the wage penalty typically found among workers with non-standard employment contracts, we also add dummies for part-time and temporary employment.

Our key explanatory variable at the country level measures union density, which corresponds to the ratio of wage and salary earners who are union members, divided by the total number of wage and salary earners. Union density measures how well-represented workers' interests are in a given country, and the bargaining strength of trade unions in that country (Visser, 2006). This indicator is commonly used as a proxy for union strength (Clark and Kanellopoulos, 2013; Lucifora et al., 2005; Pavlopoulos et al., 2010). The data on union density for European countries are derived from the OECD Labour Force Statistics. Missing data – i.e., the breaks in time series for specific countries – were imputed using interpolation by calculating the means between adjacent periods. As macro-economic conditions can, in principle, affect both the incidence of and mobility out of low-wage employment, we view the unemployment rate and GDP growth as potential

country-level confounders. We compiled data on these two measures from Eurostat and the World Bank Databank, respectively. We also control for overall proportion of low-wage jobs, calculated for each country-year based on EU-SILC data. This considers the fact that on the one hand, in countries, where it is common to start a career with a low-wage job, the scarring effects of such jobs can be weaker, on the other hand, a higher country-level proportion of low-wage jobs can indicate stronger labour market segmentation in a given country, and hence result in higher low-wage persistence. In addition, we control for the product market regulation index (PMR) constructed by Fraser Institute and available for the analysed period, which captures the restrictions on the supply of goods and services within economies. These restrictions include state regulations and corporatist barriers to business entry, as well as bureaucratic controls and fees (Parker and Kirkpatrick, 2012). While some degree of product market regulation is necessary to ensure high levels of product quality and consumer safety, excessive regulation has been seen as limiting competition and encouraging the formation of monopolies that may consequently increase labour market segmentation and reduce upward wage mobility (Kalleberg and Berg, 1988). All the country-level covariates have been standardised so that the regression coefficients reflect the way that a unit change of one standard deviation affects the probability of moving from low-wage to better paid employment.

Our data have a hierarchical structure, with individual time-specific observations nested within higher level units, i.e., we observe individuals, who are, in turn, nested in countries. We therefore used multilevel modelling techniques, as they are suitable for examining the impact of country-level

characteristics such as the level of union density, while controlling for the individual-level characteristics of low-wage workers. Following insights from Mood (2010), we use linear probability models, because the results from logistic regression cannot be compared across groups within one logistic regression model with interaction effects. At the same time, the results from linear probability models lead to the same conclusions as results from the logistic regression but can be compared both across specifications and within one specification which includes interactions.

In order to examine the differential impacts of trade unions across population subgroups, we test for interaction effects between union density and individual characteristics. Specifically, we look at interactions with gender, age groups and levels of education attainment. Multilevel modelling allows to estimate cross-level interaction effects, i.e., the combined effects of individual-level and contextual-level factors. Following recommendations from Heisig and Schaeffer (2019), we estimate multilevel models with cross-level interactions that include random slopes for individual-level variables that are interacted with union density.

We also carried out sensitivity analyses. The coefficients from the linear probability models are consistent with the results from logistic regression if the predicted probabilities are not in the tails (Mood, 2010). We compared the results from these two approaches. In the same sensitivity analyses, we addressed the concern raised in the literature on trade unions that the benefits related to higher wages and better working conditions might come at the cost of removing less-skilled workers from the workforce and reducing

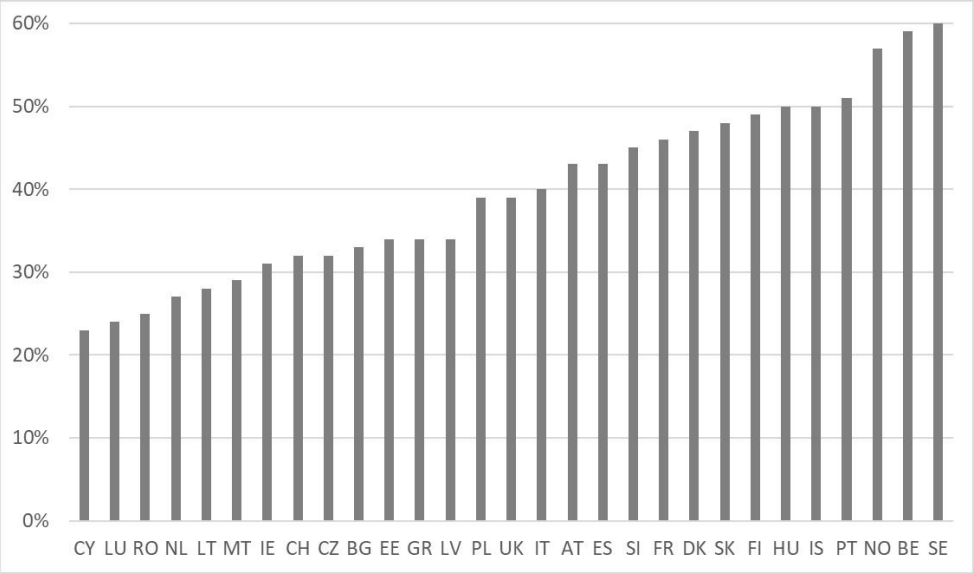
employment (for a summary of this debate, see Brady et al., 2013, p. 877). We therefore tested whether higher level of union density is associated not only with higher upward wage mobility, but also with a higher risk of job separations. Following previous studies that modelled multiple exits from low-wage employment (see e.g., Cai et al., 2017; Fourage and Pavlopoulos, 2010; Pavlopoulos et al., 2010), we estimated multinomial logistic regression models that next to the outcomes examined in the main analysis, i.e., experiencing upward wage mobility and remaining in low-wage employment, consider also the additional potential outcome of experiencing a job separation. Finally, to see whether the associations between union density and upward wage mobility may be confounded by the country-specific factors, we tested to what degree the effects of trade union density are driven by within- and between-country differences using methods advocated by Bell and Jones (2015). The results from these additional analyses are summarised at the end of the next section and fully reported in the Annex.

5. Empirical results

In order to provide an initial assessment of how upward wage mobility varies across countries, we show in Figure 1 the proportions of low-wage workers who move to better-paid employment. These descriptive statistics reveal substantial differences across European countries, with high upward wage mobility observed in countries such as Sweden, Belgium, and Norway; and rather low upward wage mobility rates found in Cyprus and Luxembourg. Our descriptive findings showing that upward wage mobility opportunities

are high in Nordic countries, but low in Continental European countries, are consistent with previous research (Pavlopoulos et al., 2010). We also show how countries in other, relatively understudied regions such as Eastern Europe fit into this picture. Some countries, such as Hungary, rank relatively high in terms of upward wage mobility, while other countries, such as Romania, score rather low.

Figure 1. Proportion of low-wage workers experiencing upward wage mobility within a year.



Source: EU-SILC data.

This descriptive evidence already suggests that countries with high union density, such as Scandinavian countries or Belgium, have higher upward wage mobility than countries with low union density, such as Luxembourg or Romania. To understand how trade unions affect low-wage workers' chances of upward wage mobility, it is crucial to examine it in a systematic way,

controlling for cross-country differences in the composition of the low-wage workers. We do this by estimating multilevel models (see Table 1). In Model 1, we show the overall impact of union density on the upward wage mobility of low-wage workers, while controlling for the individual characteristics of workers, as well as for structural, macro-economic factors and the strictness of product market regulations. Models 2-4 additionally test for the differential impacts of trade unions across population subgroups.

According to the results from Model 1, an increase in union density of one standard deviation raises the chances of upward wage mobility by four percentage points. This result provide support for our Hypothesis 1, i.e., that upward wage mobility among low-wage workers is greater in countries with higher trade union density.

Next, we test how union density affects vulnerable labour market groups such as women, young people, and the least educated. We find no gender differences in the effects of union density on upward wage mobility (Model 2). While women have lower chances of upward wage mobility, this pattern is universal across countries, and does not depend on the strength of trade unions. However, we observe a stronger positive relationship between union density and the chances of getting better-paid jobs among low-wage workers who are in the prime-age group (Model 3) and who are better educated (Model 4). While an increase in union density of one standard deviation raises the chances of upward wage mobility by three percentage points among the reference category of workers aged 18-34, among the group aged 35-49 this positive effect of union density is higher by two percentage points.

For the group aged 50-60 we observe interactions with the same sign and magnitude but the coefficient corresponding to the cross-level interaction is not statistically significant. Regarding the variation in benefits from union density across levels of education attainment, an increase in union density of one standard deviation raises the chances of upward wage mobility by two percentage points among the reference category of workers with elementary education, but this effect is stronger by three percentage points among workers with secondary or tertiary education. Overall, these findings suggest that within the group of low-wage workers, those employees who are more advantaged in terms of skills and experience, are more likely to benefit from trade union support. Accordingly, we find partial support for Hypothesis 2, suggesting that strong trade unions foster upward wage mobility to a lesser degree among more disadvantaged groups.

Table 1. Upward wage mobility among low-wage workers – the results from linear probability multilevel models.

	Model 1		Model 2		Model 3		Model 4	
	Coef.	S.E.	Coef.	S.E.	Coef.	S.E.	Coef.	S.E.
Individual characteristics								
Age (ref. 18-34)								
Age 35-49	-0.02***	(0.01)	-0.02***	(0.01)	-0.02	(0.01)	-0.02***	(0.01)
Age 50-60	-0.06***	(0.01)	-0.06***	(0.01)	-0.06***	(0.01)	-0.06***	(0.01)
Women	-0.06***	(0.00)	-0.06***	(0.01)	-0.06***	(0.00)	-0.06***	(0.00)
Education (ref. Elementary)								
Secondary	0.05***	(0.00)	0.05***	(0.00)	0.05***	(0.00)	0.06***	(0.01)
Tertiary	0.12***	(0.01)	0.12***	(0.01)	0.12***	(0.01)	0.15***	(0.02)
Health limitations	-0.03***	(0.00)	-0.03***	(0.00)	-0.02***	(0.00)	-0.03***	(0.00)
Occupational group (ref. Managers)								
Professionals	0.09***	(0.02)	0.08***	(0.02)	0.08***	(0.02)	0.08***	(0.02)
Technicians	0.04***	(0.01)	0.04**	(0.01)	0.04**	(0.01)	0.04***	(0.01)
Clerical Support	-0.01	(0.01)	-0.01	(0.01)	-0.01	(0.01)	-0.00	(0.01)
Services	-0.13***	(0.01)	-0.13***	(0.01)	-0.13***	(0.01)	-0.13***	(0.01)
Agriculture	-0.18***	(0.02)	-0.18***	(0.02)	-0.18***	(0.02)	-0.18***	(0.02)
Craft and Related Trades	-0.08***	(0.01)	-0.08***	(0.01)	-0.08***	(0.01)	-0.07***	(0.01)
Plant Operators	-0.05***	(0.01)	-0.05***	(0.01)	-0.05***	(0.01)	-0.05***	(0.01)

Elementary Occupations	-0.16***	(0.01)	-0.16***	(0.01)	-0.16***	(0.01)	-0.16***	(0.01)
Part-time	-0.03***	(0.01)	-0.03***	(0.01)	-0.03***	(0.01)	-0.03***	(0.01)
Temporary	-0.04***	(0.00)	-0.04***	(0.00)	-0.04***	(0.00)	-0.04***	(0.00)
Experience	0.00***	(0.00)	0.00***	(0.00)	0.00***	(0.00)	0.00***	(0.00)
Country-level indicators								
Union density	0.04***	(0.01)	0.05***	(0.01)	0.03**	(0.01)	0.02**	(0.01)
Unemployment rate	-0.00	(0.00)	-0.00	(0.00)	-0.00	(0.00)	0.00	(0.00)
GDP growth	0.01***	(0.00)	0.01***	(0.00)	0.01***	(0.00)	0.01***	(0.00)
Low-wage employment rate	-0.04***	(0.00)	-0.03***	(0.00)	-0.03***	(0.00)	-0.04***	(0.00)
PMR	-0.01***	(0.00)	-0.01***	(0.00)	-0.01***	(0.00)	-0.01***	(0.00)
Interactions								
Women # Union density			-0.01	(0.01)				
Age 35-49 # Union density					0.02*	(0.01)		
Age 50-60 # Union density					0.02	(0.01)		
Secondary # Union density							0.03***	(0.01)
Tertiary # Union density							0.03**	(0.02)
Constant	0.50***	(0.02)	0.50***	(0.02)	0.50***	(0.02)	0.49***	(0.02)
Log of stand. dev. (country)	-2.56***	(0.14)	-2.82***	(0.16)	-2.56***	(0.14)	-3.20***	(0.20)
Log of stand. dev. (individual)	-1.39***	(0.02)	-1.40***	(0.02)	-1.39***	(0.02)	-1.39***	(0.02)
Log of stand. dev. (residual)	-0.93***	(0.01)	-0.93***	(0.01)	-0.93***	(0.01)	-0.93***	(0.01)
Log of stand. dev. (slope)			-2.43***	(0.15)	-2.76***	(0.18)	-2.71***	(0.19)
Log of stand. dev. (slope)					-2.52***	(0.14)	-2.58***	(0.15)
Person-observations	66,579		66,579		66,579		66,579	
Sample size	50,727		50,727		50,727		50,727	
Number of countries	29		29		29		29	

*Source: EU-SILC data. Notes: p-values are denoted with * 0.10 ** 0.05 *** 0.010. Standard errors in parentheses.*

Regarding the effects of the control variables, we find that they are consistent with the previous literature, and across model specifications. Relatively high upward mobility rates are observed in the youngest age group, which reflects the fact that earnings levels stabilise in mid-life. Women and less educated workers, as well as workers with health conditions, tend to have lower

chances of upward wage mobility. Our results further indicate that the chances of climbing the wage ladder differ substantially across occupations. We also find that having a non-standard employment contract – i.e., a part-time or temporary contract – is related to lower chances of upward wage mobility among low-wage workers. A higher GDP growth is associated with increased upward mobility rates among low-wage workers. More pronounced segmentation, as captured by the overall proportion of low-wage jobs in a country, is negatively correlated with chances of climbing up the wage ladder. Furthermore, in countries with stronger product market regulation, the transition rates from low-wage employment to better-paid employment tend to be lower.

We carried out additional analyses to test whether our estimates of the impact of union density based on the linear probability model and the coefficients from logistic regression are consistent. In the same analysis, we also examined whether the benefits of union density in terms of increased chances of upward wage mobility come at the cost of increased risks of transitioning into unemployment or inactivity. We estimated a multinomial logistic regression model which considers three potentially alternatives: (1) transitioning to a better-paid employment; (2) remaining in low-wage employment; and (3) exiting employment, and we corrected for the clustering of standard errors at the country level. The results presented in Table A3 in the Annex show that union density increases the relative risk of experiencing upward wage mobility, which confirms our conclusions reached with use of linear probability models. At the same time, union density has no statistically significant effect on the risk of exiting employment. Average

marginal effects computed based on this model indicate that a unit increase in union density is related to one percentage increase in the predicted probability of upward wage mobility. Hence, the results from logistic regression lead to the same conclusions as the estimates from the linear probability models, and confirm that generally trade unions improve chances for upward wage mobility among low-wage workers. Finally, we tested to what degree the effects of trade union density are driven by within- and between-country differences adopting the methods proposed by Bell and Jones (2015). The model specification in Table A4 in the Annex provides two sets of estimates of a multilevel linear probability model: estimates that rely exclusively on variations in country-level variables within countries over time, and thus control for time-constant unobserved heterogeneity at the macro level and estimates that rely on between-country components of macro-level variations. The between-country differences in the national averages of country-level covariates can be interpreted as the correlates of their long-lasting congruence. Our results indicate that even when the unobserved between-country differences are controlled for in this analytical framework, we still find a positive impact of union density on the chances for upward wage mobility among low-wage workers. The effect size in this analysis is actually larger than implied by Model 1 in Table 1, suggesting that countries differ in terms of unobserved and stable over time factors that both restrict union density and are correlated with a higher low-wage persistence. After controlling for such factors, we observe an increase in the chances of upward wage mobility by eight percentage points. However, these additional results need to be interpreted with care, because obtaining reliable estimates

of the effects of changes in union density within countries requires substantial variation in union density across time, which we do not observe in our data due to a rather short time period considered in the analysis. Nevertheless, these additional results suggest that our findings are robust with respect to different modelling approaches.

6. Conclusions

The aim of this paper was to examine the impact of trade unions on upward wage mobility among low-wage workers in an international perspective. This topic is of increasing relevance for European societies and the trade union movement, as labour market changes in these countries have led to concerns being raised about growing labour market dualization (Kalleberg, 2011). Ensuring that low-wage jobs facilitate upward wage mobility is crucial to avoid growing societal inequalities, and trade unions are important labour market institutions that have the potential to ensure that different groups of workers have more equal career opportunities (Schmitt et al., 2008). As the effects of trade unions may differ across societal contexts, our study extends previous research that focused on a few selected countries by adopting a cross-country comparative perspective.

The results from the multilevel models show that union density is related to higher upward wage mobility among low-wage workers. The size of this association is non-negligible, as an increase in union density of one standard deviation is related to an increase in the chances of upward wage mobility by four percentage points, after controlling for both individual and country-

specific confounders. Our findings contrast those of Clark and Kanellopoulos (2013), who concluded that the relationship between union density and low-pay persistence was not statistically significant. Our conclusions are consistent with the findings for US (Brady et al., 2013), who showed that the states with higher unionization levels had lower rates of working poverty. Similarly as Brady et al. (2013), we also find that higher upward wage mobility does not come at the cost of an increased risk of exiting employment among low-wage workers. Overall, these results confirm the predictions of the power resource theory (Korpi, 1983, 2006; Stephens, 1979), which posits that improving the bargaining position of workers is more beneficial than enhancing the power of employers.

Our results also reveal how the benefits of union density differ across different subgroups of low-wage workers. We find no gender differences in the benefits from strong unions. This may indicate that there has been a shift in trade unions' strategies from their traditional focus on "white male workers" in "standard jobs" (Cha et al., 2018; Gumbrell-McCormick, 2011; Hodder et al., 2018; Meardi et al., 2021; Simms et al., 2018) to also include women (Lyhne Ibsen and Tapia, 2017; Tapia and Turner, 2018). Thus, our results suggest that the outsider effect of being a woman in a low-wage job does not have more pronounced negative consequences for a career in countries with stronger unions. However, we observe that the positive effects of union density are larger for older and better educated workers. This finding is in line with the theoretical ideas, which state that unions tend to focus their support on the groups of workers who have stronger bargaining positions, longer tenures, and higher levels of employability (Palier and

Thelen, 2010). The patterns we observe may also stem from the fact that younger and less educated workers have more limited knowledge of trade unions (Tapia and Turner, 2018).

This study has some limitations. First, while the repeated observations in EU-SILC data made it possible to examine wage mobility, because the panel is short, we could not examine the long-term changes in wage levels over the life course. While our study extends the literature by including a greater diversity of societal contexts, we could not control for all the factors that might be related to the level of union density and simultaneously determine the upward wage mobility at the bottom of the earnings distribution. We have made additional tests of the robustness of our results to such unobserved country-level confounders, but nevertheless we acknowledge that we are not able to make claims on causal relationships between union density and upward wage mobility. Finally, it would be desirable to extend the analysis of heterogeneous impacts to other groups of potential "outsiders", such as immigrants, especially given the ongoing debate on how European societies can improve the labour market chances of this marginalised group (Simms, 2017). Unfortunately, the data do not enable us to identify the country of birth of the respondents. Given that immigrants in Europe tend to be younger and less educated than the native population, and these factors seem to limit the benefits of union power, it is likely that immigrants need more support from trade unions but receive less of it. Whether this is indeed the case could be an avenue for future research.

Notwithstanding these limitations, the findings of our paper contribute to the debates around low-wage employment, labour market dualization, and the extent to which trade unions can help to decrease labour market inequalities. As the low-wage sector is likely to grow, ensuring that these jobs facilitate upward wage mobility can help to prevent inequalities from increasing over the life course. Our results demonstrate that trade unions are important labour market institutions that can facilitate upward wage mobility by strengthening the bargaining power of low-wage workers. These findings also contribute to the debate on trade union renewal (Simms, 2017), as they show that there is room for improvement in how unions support career opportunities among groups of workers with lower individual bargaining power and increase inclusiveness in the labour market. Additionally, attracting younger workers is essential for increasing union membership and securing the future bargaining position of trade unions (Pedersini, 2010).

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Annex

Table A1. Sample structure.

Variable	Mean
Upward wage mobility	38%
Age 18-34	40%
Age 35-49	40%
Age 50-60	20%
Women	61%
Elementary	29%
Secondary	57%
Tertiary	14%
Health limitation	20%
Experience	15.8
Managers	2%
Professionals	5%
Technicians and Associate Professionals	8%
Clerical Support Workers	9%
Services and Sales Workers	27%
Agricultural, Forestry, & Fishery Workers	2%
Craft and Related Trades Workers	15%
Plant and Machine Operators	10%
Elementary Occupations	22%
Part-time workers	19%
Temporary workers	23%

Source: EU-SILC data.

Table A2. Country-level indicators averaged over 2004-2015.

Country	Union density	Unemployment rate	GDP growth	PMR	Low wage employment
AT	0.30	0.05	0.01	7.50	0.19
BE	0.54	0.08	0.01	7.85	0.12
BG	0.15	0.09	0.01	7.79	0.19
CH	0.16	0.05	0.02	8.34	0.19
CY	0.52	0.09	0.00	7.15	0.23
CZ	0.17	0.07	0.03	7.69	0.18
DK	0.69	0.05	0.02	8.50	0.14
EE	0.07	0.09	0.03	7.83	0.23
ES	0.17	0.18	0.01	6.93	0.21
FI	0.70	0.08	0.01	7.61	0.16
FR	0.09	0.09	0.01	7.17	0.13
GR	0.22	0.17	-0.03	5.88	0.20
HU	0.13	0.08	0.03	7.35	0.18
IE	0.30	0.10	0.05	8.08	0.23
IS	0.86	0.07	-0.03	6.77	0.20
IT	0.36	0.10	-0.01	7.21	0.18
LT	0.09	0.11	0.02	7.38	0.28
LU	0.37	0.05	0.02	7.45	0.28
LV	0.14	0.14	-0.03	7.69	0.27
MT	0.52	0.06	0.04	7.77	0.18
NL	0.19	0.06	0.01	7.76	0.17
NO	0.50	0.04	0.01	7.22	0.15
PL	0.19	0.12	0.04	7.18	0.23
PT	0.19	0.13	-0.01	6.32	0.15
RO	0.26	0.07	0.01	7.35	0.16
SE	0.72	0.08	0.02	7.75	0.17
SI	0.31	0.07	0.01	6.82	0.18
SK	0.18	0.14	0.04	7.72	0.16
UK	0.26	0.07	0.02	7.76	0.22

Sources: Union density: OECD, Unemployment rate: Eurostat, GDP growth: World Bank Databank, PMR: Fraser Institute, Low-wage employment: EU-SILC, own calculations.

Table A3. Relative risk of upward wage mobility vs. exit from employment among low-wage workers – the results from multinomial logit models.

	Upward wage mobility		Exit from employment	
	Coef.	S.E.	Coef.	S.E.
Age (ref. 18-34)				
Age 35-49	-0.14***	(0.03)	-0.10***	(0.04)
Age 50-60	-0.38***	(0.04)	0.23***	(0.05)
Women	-0.29***	(0.02)	-0.04	(0.03)
Education (ref. Elementary)				
Secondary	0.21***	(0.02)	-0.13***	(0.03)
Tertiary	0.52***	(0.03)	-0.14***	(0.05)
Health limitations	-0.06***	(0.02)	0.32***	(0.03)
Occupational group (ref. Managers)	0.00	(.)	0.00	(.)
Professionals	0.34***	(0.07)	0.15	(0.12)
Technicians and Associate Professionals	0.13**	(0.07)	0.21*	(0.11)
Clerical Support Workers	-0.09	(0.07)	0.22*	(0.11)
Services and Sales Workers	-0.61***	(0.06)	-0.03	(0.11)
Agricultural, Forestry, & Fishery Workers	-0.81***	(0.09)	0.07	(0.13)
Craft and Related Trades Workers	-0.37***	(0.06)	0.20*	(0.11)
Plant and Machine Operators	-0.25***	(0.07)	0.07	(0.11)
Elementary Occupations	-0.77***	(0.06)	-0.03	(0.11)
Part-time workers	-0.07***	(0.02)	0.22***	(0.03)
Temporary workers	-0.14***	(0.02)	0.64***	(0.03)
Experience	0.01***	(0.00)	-0.01***	(0.00)
Union density	0.05***	(0.01)	0.00	(0.02)
Unemployment rate	0.08***	(0.01)	0.07***	(0.01)
GDP growth	0.07***	(0.01)	-0.06***	(0.01)
PMR	-0.09***	(0.01)	-0.12***	(0.02)
Low-wage employment rate	-0.24***	(0.01)	-0.05***	(0.01)
Constant	-0.04	(0.06)	-1.68***	(0.11)
Person-observations	75550			

*Source: EU-SILC data. Notes: p-values are denoted with * 0.10 ** 0.05 *** 0.010. Coefficients correspond to log odds, standard errors in parentheses.*

Table A4. Sensitivity analysis decomposing within- and between-effects of trade union density.

	Model 1	
	Coef.	S.E.
Age (ref. 18-34)		
Age 35-49	-0.02***	(0.01)
Age 50-60	-0.06***	(0.01)
Women	-0.06***	(0.00)
Education (ref. Elementary)		
Secondary	0.05***	(0.00)
Tertiary	0.12***	(0.01)
Health limitations	-0.02***	(0.00)
Experience	0.00***	(0.00)
Occupational group (ref. Managers)		
Professionals	0.08***	(0.02)
Technicians and Associate Professionals	0.04***	(0.01)
Clerical Support Workers	-0.01	(0.01)
Services and Sales Workers	-0.13***	(0.01)
Agricultural, Forestry, & Fishery Workers	-0.18***	(0.02)
Craft and Related Trades Workers	-0.08***	(0.01)
Plant and Machine Operators	-0.05***	(0.01)
Elementary Occupations	-0.16***	(0.01)
Part-time workers	-0.02***	(0.01)
Temporary workers	-0.03***	(0.00)
Between-effects of contextual factors		
Union density	0.03*	(0.02)
Unemployment rate	0.03	(0.02)
GDP growth	0.02	(0.04)
PMR	-0.02	(0.02)
Low-wage employment rate	-0.06***	(0.02)
Within-effects of contextual factors		
Union density	0.08**	(0.04)
Unemployment rate	-0.00	(0.01)
GDP growth	0.00	(0.01)
PMR	-0.00	(0.01)
Low-wage employment rate	-0.03**	(0.01)
Constant	0.48***	(0.02)
Log of stand. dev. (country)	-2.70***	(0.15)
Log of stand. dev. (individual)	-2.98***	(0.08)
Log of stand. dev. (residual)	-0.77***	(0.00)
Person-observations	66579	

*Source: EU-SILC data. Notes: p-values are denoted with * 0.10 ** 0.05 *** 0.010. Standard errors in parentheses.*

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