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Article

Intragenerational social mobility and depressive symptoms. Results from the French CONSTANCES cohort study

Hanno Hoven[a,*], Johannes Siegrist[b], Marcel Goldberg[c,d], Céline Ribet[c,d], Marie Zins[c,d], Morten Wahrendorf[a]

[a] Centre for Health and Society, Institute of Medical Sociology, Medical Faculty, University of Düsseldorf, Universitätsstrasse 1, 40225 Düsseldorf, Germany
[b] Senior professorship on work stress research, Medical Faculty, University of Düsseldorf, Germany
[c] INSERM, Population-based Epidemiological Cohorts Unit, UMS 011, Villejuif, France
[d] Paris Descartes University, France

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ABSTRACT

Background: To further explain the association between low socioeconomic position and increased risk of poor health, research started to consider life course conditions, including previous occupational positions and patterns of social mobility in the analysis. We describe patterns of intragenerational social mobility and investigate their associations with depressive symptoms.

Methods: We use data from the French CONSTANCES study, a population-based cohort and restrict the sample to people aged 45 to 60. Based on detailed retrospective data with annual information on respondents' occupational position, we assess the modal social class for two time periods – early adulthood (age 25–34) and mid-adulthood (age 35–44). Depressive symptoms are measured by the Centre for Epidemiologic Studies Depression Scale (CES-D), using sex-specific cut-points.

Results: Our study reveals that most respondents remained in stable working careers, but these careers were less frequent amongst participants with lower socioeconomic positions compared with higher ones. In contrast to several earlier findings we observe no independent associations of intragenerational social mobility processes and health once the social positions of origin and destination are considered. However, our findings confirm a social gradient in the prevalence of depressive symptoms for stable working careers.

Conclusions: Our findings underline the importance of integrating data into analysis on starting and ending points of social mobility processes within entire histories of labor market participation.

1. Introduction

Low socioeconomic position, as measured by education, income, or occupational class, is associated with an increased risk of poor health and health functioning (Glymour, Avendano, & Kawachi, 2014; Mackenbach et al., 2008). To further explain this association, research started to include life course conditions, such as working careers, into analysis (Kuh, 2003). Given the centrality of the role of work in adult life, changes in occupational positions as well as continuities in privileged or disadvantaged positions in occupational histories may exert a strong impact on health (Clougherty, Souza, & Cullen, 2010). These changes in occupational positions throughout individual life courses are usually described as processes of intragenerational upward or downward mobility and are of particular interest as opportunities are socially stratified and as such, changes can either improve or worsen everyday working conditions. For instance, occupational promotion is likely to increase control and reward at work, whereas the contrary occurs in downward mobility. Control and reward at work were identified as two crucial stress-theoretical conditions that have direct long-term effects on workers' health. This has been demonstrated in prospective cohort studies using the demand-control model (Karasek & Theorell, 1999) and the effort-reward imbalance model (Siegrist, 1996) to predict increased risks of coronary heart disease (Dragano et al., 2017; Kivimäki et al., 2013) or depression (Rugulies, Aust, & Madsen, 2017; Theorell et al., 2015).

Several studies document the adverse health effects of intragenerational occupational downward mobility or beneficial health effects of upward mobility (Behrens et al., 2016; Breeze et al., 2001; Cambois, 2004; Cambois & Laborde, 2011; Guimarães et al., 2018; Melchior et al., 2005, 2006; Miething & Åberg Yngwe, 2014;

* Corresponding author.
E-mail address: hanno.hoven@med.uni-duesseldorf.de (H. Hoven).

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Schmeisser et al., 2010). However, the evidence is inconsistent as other investigations did not or only partly confirm these associations (Guimarães et al., 2018; Houle, 2011; Huang & Sverke, 2007; Niedzwiedz, Katikireddi, Pell, & Mitchell, 2012). This inconsistency of evidence may be attributed to three important shortcomings. First, most studies focus on the effect of experiencing social mobility without considering the social position of origin and of destination (Van der Waal, Daenekindt & Koster 2017). Yet, as health risks are socially graded, it is important to take into account the position of origin, given its differential association with health. The same holds true for the position of destination. Bypassing this information may result in an overestimation of the health effects that can be attributed to occupational mobility. For example, without considering the social position of destination, it remains unclear whether an association of downward mobility and health is due to the mobility process itself or to the differential exposure to health risks associated with the occupational position of destination. Along these lines, studies including this important information were not able to confirm the proposed health effects of social mobility (Houle, 2011; van der Waal et al., 2017).

A second shortcoming of research concerns the crude distinction of occupational categories. Many studies use a broad three-categorical approach (lower, middle, higher positions), thus running the risk of underestimating the occurrence of intragenerational mobility across more nuanced occupational hierarchies (e.g. Cambois and Laborde, 2011).

Even more important is a third shortcoming, the restriction to defining the social position of origin and of destination at one single time point within individual occupational history (Houle, 2011). In fact, the measurement of social position at single time points represents only a 'snapshot' of the variety of potential mobility experiences within individual life courses and may thus contribute to a misclassification of exposure, especially in the case of employment histories marked by frequent job changes and mobility processes. Therefore, measuring time frames (instead of time points) of occupational histories is considered a more reliable approach.

In this paper, we address these shortcomings in an analysis of the association between individual employment histories and elevated depressive symptoms. Elevated depressive symptoms are an indicator of affective health functioning and have major implications on work ability (Barth, Schumacher, & Herrmann-Lingen, 2004), cognitive and physical functioning (Schaefer et al., 2017; Van Milligen, Lamers, Hoop, Smit & Penninx 2011), and mortality (Kessler et al., 2006). We obtain data from a large cohort study, where depressive symptoms were assessed in a baseline investigation and occupational histories were collected retrospectively (see Methods).

To sum up, this study investigates associations of intragenerational upward and downward social mobility with an indicator of mental health functioning (depressive symptoms) based on data from a large French cohort study. Specifically, we have two aims: Our first aim is to accurately describe social mobility processes from early adulthood to midlife (i.e. between age 25 and 44). Our second aim is to analyze associations of social mobility during this period with current depressive symptoms in a French population aged between 45 and 60 years at the time of data collection.

More specifically, our study adds to existing research in three ways. First, we consider both the socioeconomic position of origin and of destination. In doing so, we investigate social mobility processes separately for each combination of the social position of origin and of destination. Second, our measure of social position relies on a theory-based approach of social class, allowing a more differentiated categorization of occupational positions (Erikson, Goldthorpe, & Portocarero, 1979). Third, we include time frames rather than only time points in our analyses to avoid potential misclassification of social positions and to adequately consider longer term employment histories.

2. Methods

2.1. Data source

We use data from the French CONSTANCES study, a population-based cohort with a focus on occupational and environmental epidemiology that started in 2012 (Goldberg et al., 2017). CONSTANCES-data includes up to 200,000 adults aged 18 to 69 years who are covered by the General Health Insurance Fund (CNAMTS) in France (Zins & Goldberg, 2015). CNAMTS is a general health insurance that covers about 85 percent of the French population, predominantly salaried workers, professionally active or retired, and their partners. Participants are recruited from 22 social security health screening centres (HSCs) across different regions of France. Using a random sampling strategy, stratified according to unequal inclusion probabilities and based on data from participation in previous surveys involving invitations to HSCs, participants are selected and invited to participate. The sampling base is defined by all persons aged 18 to 69 years covered by CNAMTS in the catchment areas of the CONSTANCES HSCs. Baseline data collection included self-administered questionnaires and health examinations. Quality standards were met by trained study nurses and application of Standard Operations Procedures, among others (Ruiz et al., 2016). All participants signed an informed consent, and CONSTANCES has been approved by bodies regulating ethical data collection in France, namely the Comité Consultatif pour le Traitement des Informations Relatives à la Santé (CCTIRS) and the Commission Nationale Informatique et Liberté (CNIL) and the INSERM IRB.

2.2. Study population

This study relies on a sample of men and women aged 45 to 60 years (34,313 cases), a sub-sample of CONSTACES which meets our study aim, because respondents have had past employment histories with potential up- or downward mobility or stability. For our study we included only respondents who were in paid work at least once (33,048 remaining cases). Furthermore, we excluded respondents with at least one health interruption prior to age 45 or who retired before age 45 (31,718 remaining cases). The described restrictions resulted in a final sample of 10,819 men and 12,009 women with full data on depressive symptoms and on the main occupational position in early adulthood (between the age of 25 and 34, and in mid-adulthood (between 35 and 44)).

2.3. Measures

2.3.1. Occupational position

At the baseline investigation of CONSTANCES, respondents provided detailed, retrospectively assessed information on each job (lasting six months or longer) of their working career, starting from their first job up to their current job. In addition, respondents were asked to provide information on each career interruption, lasting six months or longer, including interruptions due to health problems or unemployment. For example, details on jobs and interruptions included the starting and ending date, and respondents were asked to provide a description of their profession for each job (in an open question). By combining this data, individual employment situations for each year and each participant between age 25 and 44 were retrieved, thus providing a detailed description of employment histories, covering 20 years of individual working careers (between age 25 and 44). Occupations were categorized using the "Professions et catégories socioprofessionnelles" scheme (PCS), a French classification of occupation.

Using the conversion table of the French National Institute of Statistics and Economic studies (Brousse, Monso, & Wolff, 2007), we reclassified respondents' occupational categories (based originally on

the French *Professions et catégories socioprofessionnelles* scheme (PCS)) into the European Socio-Economic Classification scheme (ESeC) (Rose & Harrison, 2007). ESeC has been developed to yield an internationally comparable classification of social positions and is based on the Erikson Goldthorpe Portocarero scheme of occupational class (EGP) (Erikson et al., 1979). In summary, ESeC distinguishes occupations based on employment relations. The most basic distinction between occupations is made by using the type of employment relations, more specifically, the differences of the employment contracts. In doing so, ESeC distinguishes employees from self-employed workers and employers. Employees are further differentiated according to individual employment regulations; ESeC thus distinguishes employees with a service contract from employees with a labor contract. Occupations with a service contract typically involve specialized skills and imply relatively high job security, salary, promotion prospects and autonomy. Labor contracts are typically characterized by work tasks that are relatively easy to monitor and jobs are characterized by lower job security, job promotion prospects and autonomy.

We adopt a six-category version of ESeC and defined the following categories: 1) higher managers and professionals, 2) lower managers and professionals, 3) intermediate employee, 4) Lower white collar, 5) skilled worker, and 6) semi- and nonskilled worker. Thus, we did not consider occupations such as self-employed worker, small employer or agricultural worker (ESeC classes 4 and 5). This has been done to obtain a broad hierarchical structure of social classes and also to avoid small numbers in specific classes, resulting from the source population of CONSTANCES. Based on yearly information on respondent's social class, we identified each participant's modal social position, defined as the longest position held during each one of the following two time periods: 1) in early adulthood (between age 25 and 34), and 2) in mid-adulthood (between 35 and 44). In the rare case that respondents had two or more modal social positions, we prioritized the most recent position in each time period.

2.3.2. Depressive symptoms

Elevated depressive symptoms were measured at the baseline investigation of CONSTANCES by the Centre for Epidemiologic Studies Depression Scale (CES-D), assessed by a self-administered questionnaire with twenty items measuring depressive symptoms (Radloff, 1977), resulting in a sum score ranging from 0 to 60. We used sex-specific thresholds for elevated depressive symptoms (20 for women and 16 for men), as validated against clinical diagnoses for the French population (Morin et al. 2011).

2.4. Analytical strategy

Following a sample description in Table 1, we describe patterns of social mobility, in terms of frequencies for each specific pattern of upward and downward mobility and of stable careers (Table 2). Here we also report row percentages, indicating – separately for each position of origin –, the proportion of respondents who remained in the same position or moved into each possible position of destination (aim 1 of the study). To analyze the associations between social mobility and depressive symptoms (aim 2 of the study), we used a series of Poisson regression models to estimate the relative risks in case of binary outcomes (Zou, 2004). Regression models were estimated seperately for each combination of social position of origin and of destination. This serves the aim to adequately consider the level of depressive symptoms in each combination of social positions. More specifically, we separately estimated regression models for each position of origin with stable social position (the same social position during early and mid-adulthood) as the reference category. In doing so, risks of elevated depressive symptoms are compared for each position of destination relative to stable careers, adjusted for sex, age, age squared and examination centre. In Fig. 1, we summarize main results and present estimated probabilities, based on the estimates presented in Table 3. This illustration enables us to distinguish between the effects of social mobility on elevated depressive symptoms and the effects of social position as such.

3. Results

The sample includes slightly more women (n = 12,009) than men (10,819) and has a mean age of 53 years. Half of the participants were in the two highest positions during both time periods, and approximately 8% were either semi- or nonskilled workers, skilled workers or lower grade white collar workers. We observed that the proportion of respondents in a higher occupational position was somewhat higher in mid-adulthood than in early adulthood. At the time of data collection, 18% of respondents exhibited elevated depressive symptoms.

Table 2 presents the distribution of participants across each combination of social mobility between the two periods of analysis, early adulthood (25–34) and mid-adulthood (35–44). The grey shaded cells represent non-mobile careers with a stable social position, i.e. no change of position between the two periods. Three results of this table deserve special attention. First, the majority of participants exhibited a stable working career, keeping the same social position during early and mid-adulthood. Second, the prevalence of stable positions was higher in more advantaged social positions: While 88% of participants

Table 1
Sample description: Observations (No.) and percentage (Col. %) or mean and standard deviation (SD), n = 22,828.

	Categories or range	No.	Col % or mean (SD)
Age	45–60	22,828	52.5 (4.5)
Gender	Male	10,819	47.4
	Female	12,009	52.6
Main occupational position between age 25 and 34	Higher managers and professionals	3370	14.8
	Lower managers and professionals	7918	34.7
	Intermediate employee	6328	27.7
	Lower grade white collar worker	1665	7.3
	Skilled worker	2002	8.8
	Semi- and non-skilled worker	1545	6.8
Main occupational position between age 35 and 44	Higher managers and professionals	4022	17.6
	Lower managers and professionals	8246	36.1
	Intermediate employee	5767	25.3
	Lower grade white collar worker	1595	7.0
	Skilled worker	1730	7.6
	Semi- and non-skilled worker	1468	6.4
Depressive symptoms	not elevated	18,780	82.3
	elevated	4048	17.7

Table 2
Occupational pathways between early adulthood (25–34) and mid-adulthood (35–44). Frequencies and row percentages.

	Main social position during mid-adulthood					
Main social position during early adulthood	Higher managers and professionals	Lower managers and professionals	Intermediate employee	Lower grade white collar worker	Skilled worker	Semi- and non-skilled worker
Higher managers and professionals	2965 88.0	286 8.5	97 2.9	7 0.2	6 0.2	9 0.3
Lower managers and professionals	572 7.2	6961 87.9	251 3.2	63 0.8	44 0.6	27 0.3
Intermediate employee	379 6.0	696 11.0	4900 77.4	215 3.4	46 0.7	92 1.5
Lower grade white collar worker	30 1.8	122 7.3	245 14.7	1124 67.5	46 2.8	98 5.9
Skilled worker	55 2.8	108 5.4	144 7.2	56 2.8	1527 76.3	112 5.6
Semi- and non- skilled worker	21 1.4	73 4.7	130 8.4	130 8.4	61 4.0	1130 73.1

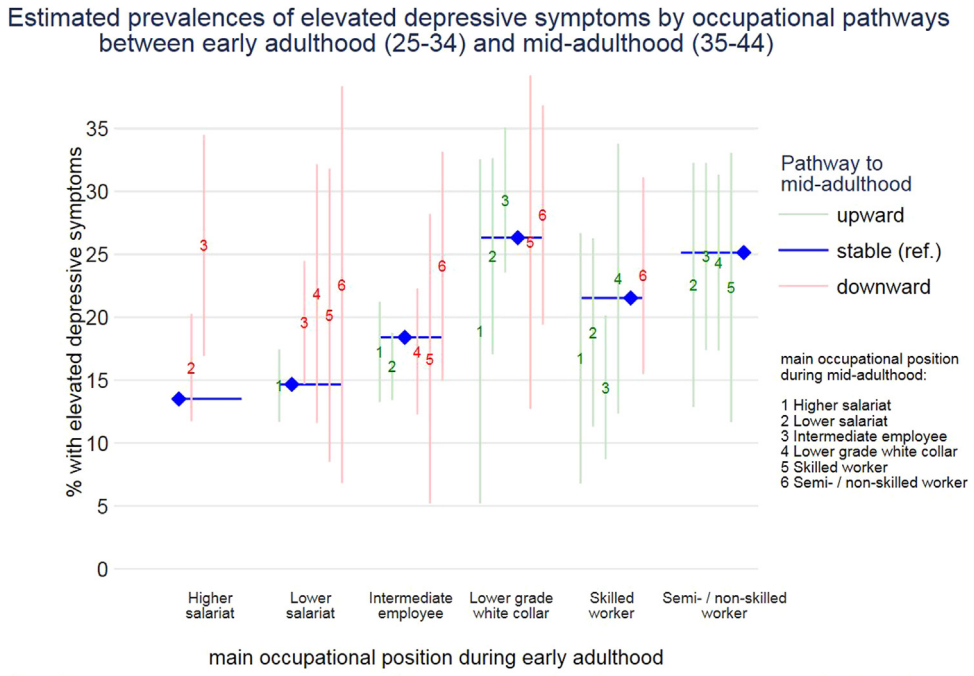

Fig. 1. Estimated prevalences of depressive symptoms by occupational pathways between early adulthood (25-34) and mid-adulthood (35-44).

with the highest social position in early adulthood remained in their position during mid-adulthood, this held true for 73% only amongst the semi- and nonskilled workers, and for 68% amongst lower grade white collar workers. Third, downward mobility (on the right side of the grey shaded cell in each row of Table 2), and upward mobility (on the left side of the grey shaded cell in each row of Table 2) were observed in almost all combinations, although with low frequency. Therefore, almost all possible combinations of social positions during early and mid-adulthood were represented in the data and could be investigated in subsequent analyses.

In Table 3, findings on the associations between social mobility and risk of elevated depressive symptoms are displayed. Here, we show for each combination of the position of origin and of destination the estimate of elevated depressive symptoms relative to the risk for those in stable careers (having the same modal position during early adulthood and mid-adulthood). Again, in this table, these stable combinations are marked by grey shaded cells. To illustrate findings, turning to the first line indicating the effects of social mobility on depressive symptoms, we see that respondents who were moving from a “higher managers and professionals position” to a “lower managers and professionals position” had a 1.2-fold increased risk of elevated depressive symptoms, compared to those with a stable higher managers and professionals position. A further finding shows that moving downward from a “higher managers and professionals position” to an “intermediate employee position” is related to a 1.9-fold increased risk. Results displayed in Table 3 can be summarized as follows: First, it is apparent that only two out of 27 estimates provide statistically significant results. Thus, there is only marginal support of the hypothesis that intragenerational social mobility during early and mid-adulthood is associated with elevated depressive symptoms later on. Secondly, we observed however some minor tendency of (non-significant) estimates of elevated depressive symptoms in association with downward mobility, and of reduced depressive symptoms in association with upward mobility.

In Fig. 1, we present estimated prevalences of elevated depressive symptoms by social mobility, based on multivariable Poisson regressions (adjusted for sex, age, age squared and examination centre).

Table 3
Occupational pathways between early adulthood (25–34) and mid-adulthood (35–44) and elevated depressive symptoms. Relative risks and 95% Confidence Intervals (95% C.I.).

	Main social position during mid-adulthood											
	Higher managers and professionals		Lower managers and professionals		Intermediate employee		Lower grade white collar worker		Skilled worker		Semi- and non- skilled worker	
	RR	(95% C.I.)	RR	(95% C.I.)	RR	(95% C.I.)	RR	(95% C.I.)	RR	(95% C.I.)	RR	(95% C.I.)
Main social position during early adulthood												
Higher managers and professionals	ref		1.18	(0.89,1.57)	1.90***	(1.34,2.71)	–		–		–	
Lower managers and professionals	0.99	(0.81,1.22)	ref		1.34*	(1.03,1.73)	1.49	(0.93,2.40)	1.37	(0.77,2.46)	1.54	(0.76,3.11)
Intermediate employee	0.94	(0.74,1.19)	0.87	(0.73,1.04)	ref		0.94	(0.70,1.26)	0.91	(0.45,1.81)	1.31	(0.89,1.92)
Lower grade white collar worker	0.72	(0.34,1.49)	0.94	(0.68,1.31)	1.11	(0.89,1.39)	ref		0.99	(0.59,1.66)	1.07	(0.77,1.48)
Skilled worker	0.78	(0.43,1.42)	0.87	(0.58,1.32)	0.67	(0.45,1.01)	1.07	(0.67,1.72)	ref		1.08	(0.76,1.54)
Semi- and non- skilled worker	–		0.90	(0.58,1.40)	0.99	(0.72,1.36)	0.97	(0.71,1.32)	0.89	(0.54,1.45)	ref	

Note. Estimates are based on Poisson regressions. Adjusted for sex, age, age squared and examination centre.
* $p < 0.05$,
*** $p < 0.001$.

Estimates represented by a diamond indicate the prevalence for respondents with stable careers (the same occupational position during early and mid-adulthood). Prevalences of elevated depressive symptoms are furthermore given for each pathway of social mobility, by indicating the prevalence for each combination of the position of origin (class 1 to class 6) and of destination (class 1 to 6). We see again that social mobility (either upward or downward) is not significantly associated with elevated depressive symptoms. Findings from Fig. 1 confirm the results from Table 3. For downward mobility, the proportion of respondents with elevated depressive symptoms is not consistently higher than for upward mobility and stable careers. Fig. 1 clearly indicates however, that the proportion of respondents with elevated depressive symptoms is generally lower in stable higher occupational positions than in stable lower positions. For instance, less than 15% of the respondents with a stable higher manager and professional position during early and mid-adulthood have elevated depressive symptoms, whereas this is the case for 25% of the semi- and non-skilled workers. The highest prevalence of depressive symptoms for stable careers is observed amongst stable lower grade white collar workers (class 4). A final finding derived from Fig. 1 is the relatively high prevalence of elevated depressive symptoms for respondents who have a destination position as a semi- and non-skilled worker, regardless of their position of origin.

4. Discussion

In this study we described social mobility processes in early and mid- adulthood and analyzed the links between social mobility and depressive symptoms at later age (i.e. from 45 to 60 years). We used retrospectively assessed data from a large French cohort study on social position throughout individual life courses and were able to obtain a detailed measure of occupational position, representing a broad hierarchical structure of social class. We investigated social mobility processes between early adulthood (age 25 and 34) and mid-adulthood (age 35 and 44), using time periods of entire employment histories. Taken together, three findings deserve attention: First, our study revealed that most respondents remained in stable working careers, where stable careers were less frequent amongst participants with lower socioeconomic positions compared with people in higher positions. Second, social mobility, both upward and downward, was not consistently associated with later risk of elevated depressive symptoms. Third, a strong association was observed between the main occupational position in early and mid-adulthood and the risk of depressive symptoms later on, leaving those in lower positions at higher risk (Fig. 1). This latter finding is in line with results from a systematic review of investigations demonstrating a social gradient of depressive symptoms (Lorant et al., 2003).

In contrast to several earlier findings, we did not detect evidence of a consistent association between intragenerational social mobility and health, neither for upward nor for downward mobility. Thus, the findings of the current study do not support most of the previous research. A possible explanation of this discrepancy concerns the methodological difference of assessing mobility processes. The majority of studies with positive findings did not include information on the position of origin and of destination in analyzing the health effects of upward and downward social mobility (Behrens et al., 2016; Breeze et al., 2001; Cambois, 2004; Cambois & Laborde, 2011; Guimarães et al., 2018; Miething & Åberg Yngwe, 2014; Schmeisser et al., 2010), whereas studies that considered the social position of origin and of destination (Houle, 2011; van der Waal et al., 2017) reported no significant associations with health, consistent with our results. Thus, our findings underline the importance of considering details on starting and ending points of social mobility processes. We cannot exclude another interpretation claiming that the CONSTANCES sample with its high degree of occupational stability may deviate from other samples of working populations with a substantially higher degree of social

mobility, where a higher probability of observing significant associations with health would be given. Furthermore, it is possible that mobility in early and mid-adulthood is associated with imminent changes in mental health, rather than with long-term effects analyzed in the current study. Yet, with our approach, we were not able to test this interesting hypothesis.

This study has several strengths and limitations. The large sample size covering a variety of occupations and professions, and the application of a theoretically-based measurement of social position are considered strong points. Moreover, using rich data on retrospectively assessed occupational biographies enabled us to analyze entire occupational trajectories, and to define social mobility processes during longer time periods, assessing social position of origin and of destination for each mobility event. This approach resulted in a more specific measure of social position, compared with studies using single time points and running the risk of misspecification of respondents' actual occupational position. We also applied a widely used clinically valid measure of self-reported depressive symptoms with sex-specific cut-off points validated for the French population (Morin et al., 2011). Finally, we performed sensitivity analyses to look at potential confounding effects, by adjusting for education and for parents' social position in multivariable analysis. In these additional calculations (not shown) estimates remained stable.

Despite these strengths, we also have to consider several limitations. First, we rely on a retrospective assessment of social positions between age 25 and 44, and a potential recall bias may have reduced the validity of respondents reports of their social positions throughout their life courses. Thereby respondents may have a tendency of reducing the complexity of employment histories (Rubin & Baddeley, 1989), or underreporting unfavorable life events (Manzoni, Vermunt, Luijkx, & Muffels, 2010). However, there is also support of the notion that retrospective data provide reliable and valid information on individual employment histories (Wahrendorf et al., 2018). The second limitation is related to the age range of our sample with respondents aged 45 to 60 years. Here, we have to consider two limitations: First, the above mentioned recall-bias might be higher for older respondents with a considerable time gap between the retrospective interview and their past employment histories. Second, older respondents have more unobserved years between employment history and health assessment than younger respondents and we cannot preclude that potential mediators might have an impact on our findings.

The third limitation relates to the classification of social positions, based on the ESeC scheme. While this scheme includes employers and self-employed occupations we decided not to include periods of self-employed work or working as an employer, first, because it was difficult to classify these occupations in a vertical social structure, and, second, because these occupational groups were disproportionally smaller than the remaining categories. We did also not consider unemployment periods for essentially the same reasons although one can argue that unemployment (or inactivity) may represent a distinct social class category within the ESeC classification scheme (Cambois, 2004).

Fourth, we restricted our sample to respondents without interruptions in the working career due to health issues, and we excluded respondents who retired before age 45. With these restrictions we tried to minimize the risk of reverse causation due to health selection although this risk cannot sufficiently be controlled within the limits of our study design. Finally, for our analysis we chose two time periods to observe mobility events, and we focused on two stages, the start and the end of one mobility process for each person. It is possible that additional mobility events occurred (e.g. return to the original position after a certain time) that we missed with our approach. Thus, future studies may apply sequence analysis to investigate whole trajectories of occupational mobility and to account for the timing, ordering and duration of social positions throughout the life course.

In conclusion, this study has shown that social mobility processes in early and mid-adulthood, both in terms of upward and downward mobility, do not contribute towards explaining the occurrence of depressive symptoms in older working people. However, our findings confirm a social gradient in the prevalence of depressive symptoms among older workers with stable working careers. The lower one's main occupational position throughout early and mid-adulthood, the higher the risk of depressive symptoms later on. This latter finding may lend support to the notion that investments into the quality of working and employment conditions can be instrumental in reducing social inequalities in mental health.

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Ethical statement

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Informed consent was obtained from all individual participants included in the study. The analyses were carried out in accordance with the relevant guidelines and regulations. The data that support the findings of this study are not publicly available due to legal restrictions, but applications for data access can be submitted in the context of calls for proposals. For more information about how to make use of the CONSTANCES cohort, see http://www.constances.fr/index_EN.php.

Declaration of interest

The authors declare that they have no conflict of interest.

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