



# Trajectories of job demands and control and the risk for subsequent depression

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## Background

Depression is a common mental disorder that causes disability worldwide<sup>1</sup>. Occupational stress research has shown that both acute work-related stressful experiences and enduring structural occupational factors contribute to depression<sup>2</sup>. The demand-control model<sup>3</sup> has been a leading work stress model in the field and classify jobs into four categories: high strain (high demands, low control), low strain (low demands, high control), active (high demands, high control) and passive jobs (low demands, low control).

High job demands, low job control and high strain are indeed found to be risk factors for depressive symptoms<sup>4-8</sup>. However, relatively few longitudinal studies have investigated how changed or repeated exposure to job strain over time is associated with subsequent depression. More knowledge is thus needed regarding how duration of, and change in demands, control and job strain relates to the risk for developing depression.

## Aim

The aim of the present study was to investigate how accumulated and/or changed exposure to job demands and job control influence the risk for subsequent depression.

## Methods and Materials

The sample included 7949 subjects in the Swedish Longitudinal Occupational Survey of Health study (SLOSH), which follows up a sample of the Swedish working population. The subjects who were included had been responding to self-administered questionnaires every other year in 2006-2014 and were free of depression in 2006-2012, when exposure to demands and control was measured. The Swedish version of the Demand-Control-Support-Questionnaire assessed perceived job demands and control. The Symptom Checklist-Core Depression scale was used to assess depressive symptoms in 2014, ranging from 0-24 with a cut-off of  $\geq 17$  used to indicate major depression. Univariate and joint group-based trajectory modelling identified groups with similar development of demands and control at four time points in 2006-2012. Logistic regression was then used to estimate the risk of major depression in 2014 according to the joint trajectories, controlling for the covariates sex, age, children at home and previous level of depressive symptoms.

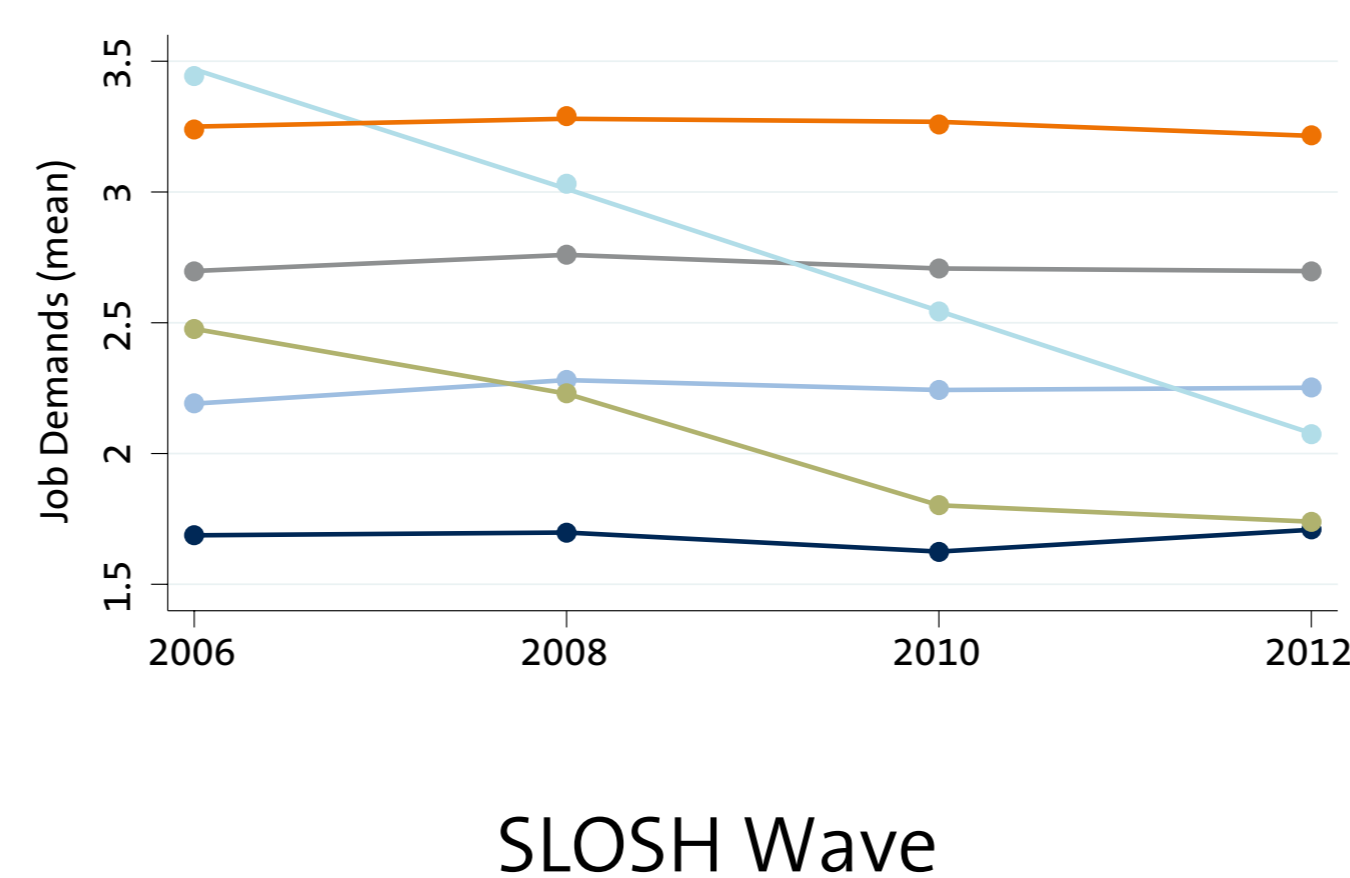
## Results

The univariate demand model considered to be the optimal consisted of six trajectory groups. With the exception of two decreasing groups, the results indicate that perceived job demands were overall quite stable across the four time points (see figure 1). Similarly, the optimal control model consisted of six trajectory groups and indicated that control was very stable over time (see figure 2).

The optimal joint trajectory model included seven groups, which also followed relatively stable patterns over time (see figure 3). The joint trajectories were classified according to the demand-control model. The trajectories included three passive groups, (group 1, 2 and 4), one high strain group (group 3), two low strain groups (group 5 and 7) and one active group (group 6).

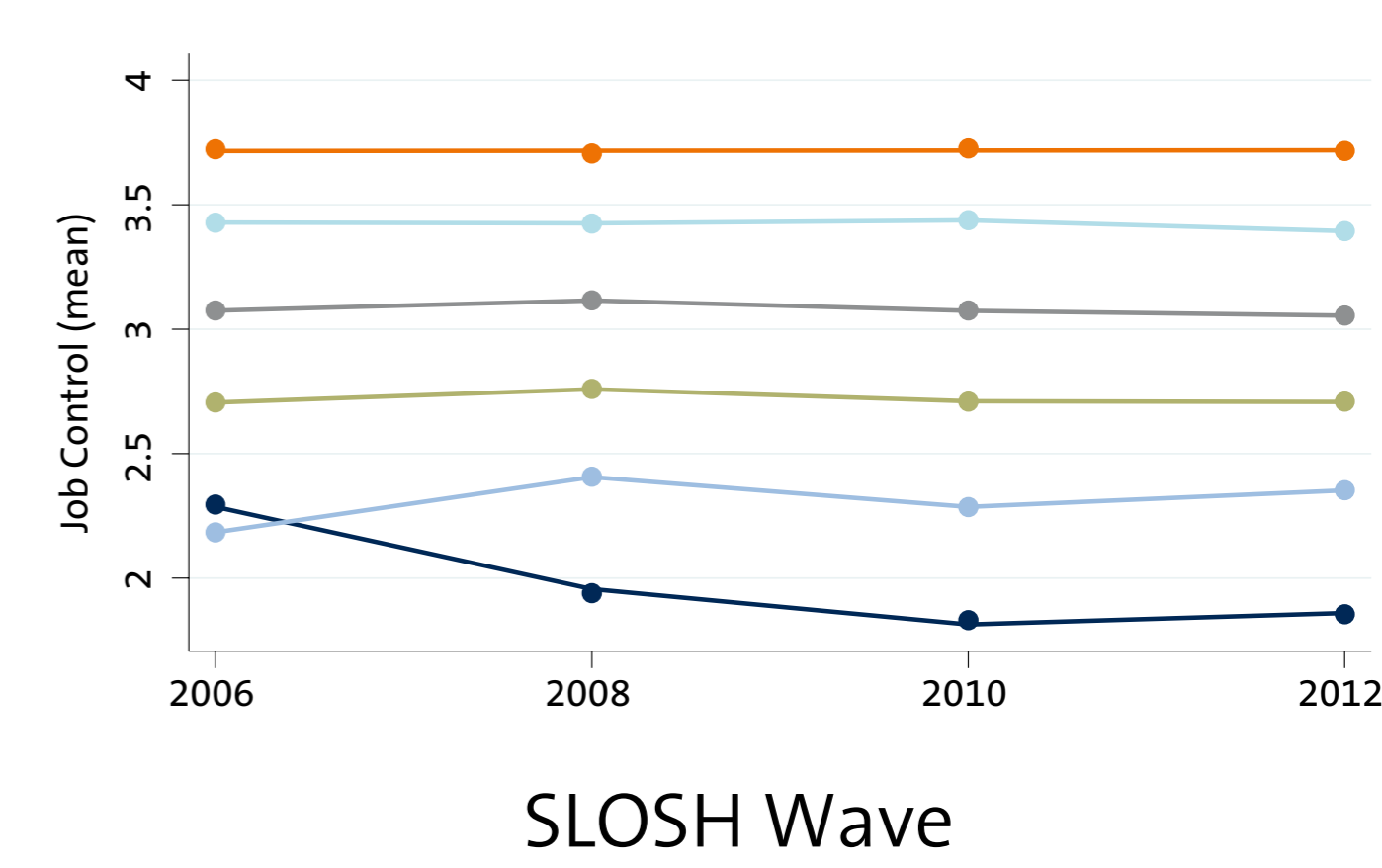
In the unadjusted logistic regression model (model 1), those belonging to the high strain and active trajectories were statistically significantly more likely to have major depression in 2014, compared to the reference group with low strain (see table 1). When adjusting the model for previous depressive symptoms (model 2) the associations were, however, no longer statistically significant even though the overall patterns remained. When the covariates age, sex and children at home were included in the model (model 3) none of the trajectory groups were significant predictors of major depression, even though the estimate for the active group was close to statistically significant. No clear association was evident in model 4, adjusting both for previous depressive symptoms and age, sex and children at home.

Figure 1



1	6.9%	2	35.9%
3	3.9%	4	38.8%
5	2.3%	6	12.2%

Figure 2



1	1.2%	2	5.1%
3	18.7%	4	34.4%
5	34.0%	6	6.7%

Figure 3



Table 1

Results from logistic regression analysis predicting major depression in 2014. Odds ratios (OR) and confidence intervals (CI).

Joint Trajectory Groups	Modell 1		Modell 2		Modell 3		Modell 4	
	OR	CI	OR	CI	OR	CI	OR	CI
Low strain (5 & 7) reference								
Passive (1)	1.91	0.83-4.39	1.27	0.54-2.97	1.21	0.41-3.53	0.87	0.29-2.58
Passive (2)	1.18	0.64-2.17	1.09	0.58-2.03	1.16	0.60-2.27	1.07	0.54-2.11
High strain (3)	<b>2.47</b>	1.45-4.24	1.35	0.78-2.37	1.59	0.82-3.12	0.94	0.47-1.87
Passive (4)	1.47	0.93-2.32	1.12	0.70-1.80	1.47	0.88-2.46	1.19	0.70-2.03
Active (6)	<b>2.18</b>	1.32-3.61	1.27	0.76-2.14	1.76	0.99-3.16	1.12	0.61-2.04
Previous depressive symptoms	-	-	<b>1.24</b>	1.19-1.28	-	-	<b>0.96</b>	0.95-0.98
Age (continuous)	-	-	-	-	<b>0.96</b>	0.95-0.98	1.47	0.98-2.21
Women	-	-	-	-	<b>1.62</b>	1.10-2.41	0.79	0.54-1.17
No children at home	-	-	-	-	0.77	0.52-1.13	<b>1.21</b>	1.16-1.26

Model 1: Unadjusted model. Model 2: Adjusted for previous depressive symptoms. Model 3: Adjusted for age, sex and children at home. Model 4: Adjusted for previous depressive symptoms, age, sex and children at home. Number in parentheses refers to the original joint trajectory group number.

## Conclusions

This study indicates that the levels of job demands and job control, both separately and in combination are relatively stable over a time period of six years. Long-term exposure to a high strain or active job may be associated with an increased risk for subsequent depression.

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