



# Job demand, control and social support as predictors of subsequent trajectories of depressive symptoms

Julia Åhlin<sup>1</sup>, Kristiina Rajaleid<sup>1,2</sup>, Markus Jansson-Fröjmark<sup>3</sup>, Hugo Westerlund<sup>1</sup>, Linda Magnusson Hanson<sup>1</sup>

<sup>1</sup>Stress Research Institute, Stockholm University, Stockholm, Sweden, <sup>2</sup>Centre for Health Equity Studies, Stockholm University/Karolinska Institutet, Stockholm, Sweden, <sup>3</sup>Centre for Psychiatry Research, Department of Clinical Neuroscience, Karolinska Institutet, Stockholm, Sweden

## Background

Depression is a common mental disorder and a major public health concern. Depression is episodic by nature, and timing of the onset and remission tends to vary a lot, indicating that there are different trajectories, possibly with differing causes and outcomes<sup>1</sup>. Predictors of depression trajectories with larger symptom burden may include female gender, lower income/education<sup>2</sup>, as well as stressful events, comorbid or co-occurring mental disorders and low socio-economic status<sup>1</sup>. Psychosocial working conditions such as job demands, job control and social support which are included in the Job-Demand-Control-Support model, have been associated with depressive symptoms<sup>3</sup>. However, no previous study to our knowledge has investigated how these psychosocial working conditions may influence depressive symptom trajectories in particular, which this study aimed to examine.

## Methods

We used data from the Swedish Longitudinal Occupational Survey of Health (SLOSH), in which participants completed questionnaires every other year from 2006 to 2016. We included 6679 subjects who: 1) responded to the questionnaire intended for those 'in paid work' at baseline (2006/2008); 2) responded to the depression items in at least one wave between wave three and six (to model their depression trajectories during this time), and 3) were 54 years or younger in 2006, excluding participants aged 65 years or older in 2016, who were thus likely to have retired. Symptoms of depression were measured using the SCL-Core Depression scale (SCL-CD<sub>6</sub>)<sup>4</sup> ranging from 0-24 and job demands, job control and social support were measured using the Swedish version of the Demand-Control-Support-Questionnaire<sup>5</sup>. Median split was used to classify high and low job demands, job control and social support. Covariates included sex, age, civil status, occupational status and baseline level of depressive symptoms. Group-based trajectory models were used to identify trajectory groups with similar development of depressive symptoms in 2010-2016 (i.e. across four waves). Multinomial logistic regression models (crude and adjusted) estimated the association between baseline job demands, job control, social support and subsequent trajectories of depressive symptoms.

## Results

We found that a trajectory model with six-group best represented the data. Baseline characteristics of the study sample and of the six depression trajectory groups are presented in Table 1. Chi<sup>2</sup>-tests showed significant differences between the trajectory groups in terms of the distribution of sex, age, civil status, occupational status, job demands, job control and social support. The six different depression trajectories included two trajectories with low symptoms, one small trajectory class with severe and persistent symptoms, as well as three mild/moderate trajectories, see Figure 1. Visual inspection of the trajectories indicated that depressive symptoms, except in the increasing doubtful-to-mild and decreasing moderate-to low trajectories remained approximately at the same level across all four waves.

High job demands and low social support, but not low control, were associated with subsequent trajectories with higher symptom level compared to very low symptom level, even after adjusting for demographic covariates in model 1 (sex, age, civil status, occupational status) and baseline depressive symptoms in addition to the demographic covariates in model 2, see Table 2. The risk ratios in the adjusted models for high job demands ranged from 1.32 (persistent low symptom trajectory) to 2.35 (persistent severe symptom trajectory) and for low social support from 1.56 (persistent low) to 2.51 (persistent severe).

## Conclusions

The results indicated that perceptions of high job demands and low social support are associated with higher or increasing levels of depressive symptoms over time. This supports the supposition that high job demands, and low social support have long-term consequences for depressive symptoms.

## REFERENCES

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Table 1. Characteristics of the sample and of the depression trajectory groups, n=6679.

		Trajectory groups							P-value
		Total	Persistent very low	Persistent low	Increasing doubtful-to-mild	Decreasing moderate-to-low	Persistent moderate	Persistent severe	
		N=6679	N (%)	N (%)	N (%)	N (%)	N (%)	N (%)	
Sex	Men	2889 (43.3)	669 (54.0)	1606 (44.0)	318 (37.0)	67 (27.2)	208 (33.0)	21 (28.0)	0.000
	Women	3790 (56.7)	571 (46.0)	2043 (56.0)	521 (62.1)	179 (72.8)	422 (67.0)	54 (72.0)	
Age group	< 35 years	1423 (21.3)	188 (15.2)	802 (22.0)	196 (23.4)	62 (25.2)	159 (25.2)	16 (21.3)	0.000
	35-49 years	3738 (56.0)	729 (58.8)	2022 (55.4)	454 (54.1)	134 (54.5)	355 (56.4)	44 (58.7)	
	≥ 50 years	1518 (22.7)	323 (26.0)	825 (22.6)	189 (22.5)	50 (20.3)	116 (18.4)	15 (20.0)	
Civil status	Single	1421 (21.4)	249 (20.2)	733 (20.2)	189 (22.7)	66 (27.0)	169 (27.0)	15 (20.3)	0.001
	Married/cohabiting	5218 (78.6)	982 (79.8)	2898 (79.8)	644 (77.3)	178 (73.0)	457 (73.0)	59 (79.7)	
Occupational status	Unskilled employees	961 (15.8)	185 (15.4)	542 (15.5)	141 (17.2)	36 (14.7)	99 (16.3)	22 (31.9)	0.011
	Skilled employees	958 (15.7)	226 (18.9)	543 (15.5)	120 (14.7)	33 (13.5)	93 (15.3)	10 (14.5)	
	Assistant non-manual employees	728 (12.0)	141 (11.8)	416 (11.9)	96 (11.7)	34 (13.9)	81 (13.3)	11 (15.9)	
	Intermediate non-manual employees	1899 (31.2)	341 (28.4)	1104 (31.6)	268 (32.8)	72 (29.4)	190 (31.3)	14 (20.3)	
	Professionals/Upper-level executives	1190 (19.5)	221 (18.4)	705 (20.2)	154 (18.8)	57 (23.3)	110 (18.1)	7 (10.1)	
	Self-employed	354 (5.8)	85 (7.1)	189 (5.40)	39 (4.8)	13 (5.3)	35 (5.8)	5 (7.2)	
Job demands	High demands	3128 (47.5)	396 (32.4)	1677 (46.5)	471 (57.3)	140 (57.1)	394 (63.3)	50 (67.6)	0.000
	Low demands	3461 (52.5)	826 (67.6)	1927 (53.5)	351 (42.7)	105 (42.9)	228 (36.7)	24 (32.4)	
Job control	Low control	2744 (41.5)	468 (38.1)	1481 (40.1)	373 (44.9)	93 (38.8)	296 (47.7)	33 (44.0)	0.001
	High control	3866 (58.5)	761 (61.2)	2133 (59.0)	458 (55.1)	147 (61.3)	325 (52.3)	42 (56.0)	
Social support	Low support	2219 (34.1)	229 (18.9)	1169 (32.9)	359 (43.8)	109 (45.6)	312 (51.4)	41 (58.6)	0.000
	High support	4280 (65.9)	984 (81.1)	2382 (67.1)	460 (56.2)	130 (54.4)	295 (48.6)	29 (41.4)	

\*Missing information: civil status (n=40, 0.6%), occupational status (n=241, 3.6%), job demands (n=90, 1.3%), job control (n=69, 1.0%), social support (n=180, 2.7%)

Table 2. Association between job demands, job control and social support respectively, and the depression trajectories, presented as relative risk ratios (RR) and 95% confidence intervals (CI), n=6076 in all models (individuals with complete data).

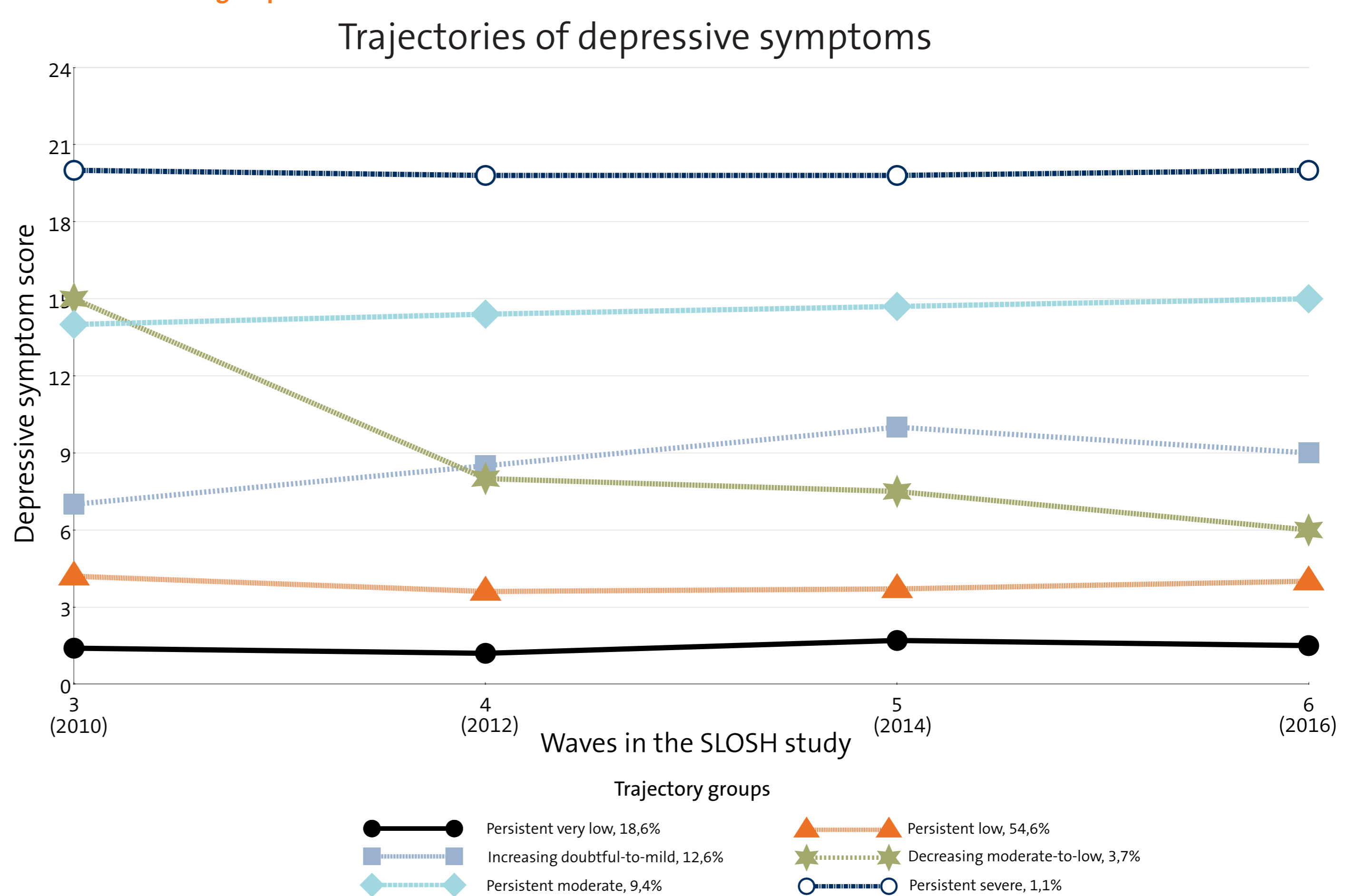
Predictor	Depression trajectory group	Crude model <sup>a</sup>		Model 1 <sup>b</sup>		Model 2 <sup>c</sup>	
		RR	95% CI	RR	95% CI	RR	95% CI
High job demands	Persistent very low	1.00	(reference)	1.00	(reference)	1.00	(reference)
	Persistent low	1.87	1.62-2.16	1.88	1.63-2.17	1.32	1.13-1.54
	Increasing doubtful-to-mild	2.80	2.32-3.39	2.88	2.38-3.50	1.54	1.24-1.89
	Decreasing moderate-to-low	2.65	1.98-3.55	2.71	2.02-3.65	1.34	0.98-1.84
	Persistent moderate	3.56	2.88-4.40	3.75	3.02-4.65	1.59	1.25-2.03
	Persistent severe	5.24	2.98-9.19	6.17	3.49-10.90	2.35	1.30-4.25
Low job control	Persistent very low	1.00	(reference)	1.00	(reference)	1.00	(reference)
	Persistent low	1.15	1.00-1.32	1.18	1.02-1.37	1.06	0.91-1.24
	Increasing doubtful-to-mild	1.37	1.14-1.65	1.38	1.13-1.68	1.13	0.91-1.40
	Decreasing moderate-to-low	1.05	0.78-1.40	1.04	0.76-1.43	0.83	0.60-1.16
	Persistent moderate	1.50	1.22-1.84	1.46	1.17-1.82	1.10	0.86-1.41
	Persistent severe	1.25	0.75-2.10	0.89	0.51-1.54	0.63	0.35-1.12
Low social support	Persistent very low	1.00	(reference)	1.00	(reference)	1.00	(reference)
	Persistent low	2.22	1.88-2.63	2.27	1.92-2.69	1.56	1.30-1.86
	Increasing doubtful-to-mild	3.58	2.90-4.40	3.68	2.98-4.54	1.85	1.47-2.33
	Decreasing moderate-to-low	3.73	2.75-5.04	3.93	2.89-5.33	1.82	1.31-2.52
	Persistent moderate	4.84	3.87-6.06	5.05	4.03-6.34	1.93	1.49-2.50
	Persistent severe	7.17	4.21-12.22	7.63	4.45-13.07	2.51	1.43-4.41

<sup>a</sup> No covariates included

<sup>b</sup> Adjusted for sex, age, civil status and occupational status

<sup>c</sup> Adjusted for sex, age, civil status, occupational status and baseline depressive symptoms

Figure 1. Trajectories of depressive symptom scores (0-24) across wave 3-6 in the SLOSH study, and the proportion of individuals in each group.



## CONTACT

Julia Åhlin, Stress Research Institute, Stockholm, Sweden  
E-mail julia.ahlin@su.se

