

UNIVERSITY OF OULU

Evening Chronotype Is Associated with Poor Work Ability and Disability Pensions at Midlife (NFBC 1966)

Tapio R ih a, Iiro Nerg, Heidi Jurvelin, Andrew Conlin, Marko Korhonen and Leena Ala-Mursula
University of Oulu

Introduction

Chronotype is the phenotypical manifestation of the underlying circadian rhythm (the ‘inner clock’) of a living organism. The inner clock influences the cycles of sleep, activity, eating, body temperature and hormone excretion in an approximately 24-hour period. Based on timing of physiological functions and alertness, people can be divided into morning (M), intermediate (I) and evening (E) types.

E-types tend to have poorer health and morning-time functioning than M-types. Still, there are no previous studies on the role of chronotype on work ability (WA) using population-level data, and no previous studies on chronotype in relation to disability pensions (DP).

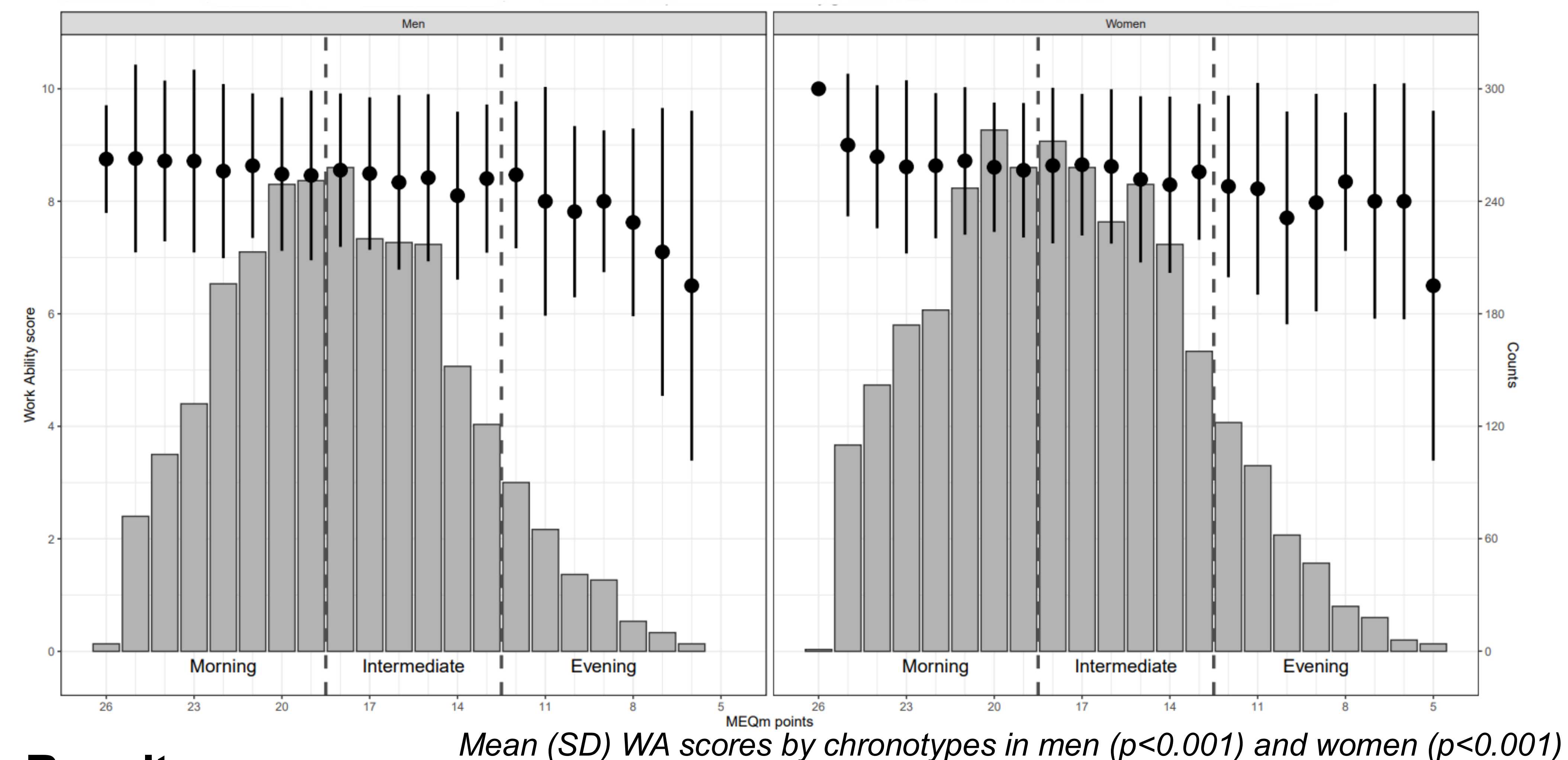
Materials and Methods

Among non-retired individuals (n=5831; 2672 men, 3159 women) of the Northern Finland Birth Cohort 1966 (NFBC1966), chronotype was determined at the age of 46 years with modified Morningness–Eveningness Questionnaires (MEQm) in 2012. The outcomes were poor WA in 2012, indicated by scores 0–7/10 of Work Ability Score, and registered emergence of DPs in 2013–2016. Multivariate logistic and Cox regression analyses were separately adjusted for factors related to sleep, health and behaviours, sociodemographic and economic factors, or working times.

Results

Total	Men, N = 2672			Women, N = 3159		
	Morning	Intermediate	Evening	Morning	Intermediate	Evening
N = 5831	N = 1222	N = 1186	N = 264	N = 1392	N = 1385	N = 382
Insomnia (N = 5659)** - Yes, N = 1931	344 (29.2)	402 (35.3)	126 (48.8)	405 (29.8)	492 (36.4)	162 (43.9)
General health (N = 5802)** - Poor, N = 1790	336 (27.7)	416 (35.1)	127 (48.7)	340 (24.5)	407 (29.5)	164 (43.2)
Education level (N = 5831)* - Tertiary, N = 3001	483 (39.5)	550 (46.4)	125 (47.3)	774 (55.6)	828 (59.8)	241 (63.1)
Work schedule (N = 5050)** - Day work, N = 4035	899 (85.9)	829 (79.9)	151 (69.9)	987 (80.5)	927 (77.8)	242 (73.1)

Selected comparative data between chronotypes in 2012 (46 years of age) in N (%). * p < 0.05, ** p < 0.001 between chronotype groups in men and in women.



Results

Compared with M-types, the unadjusted ORs with 95% CIs of poor WA for E-type men and women were 2.24 (95% CI 1.62 to 3.08) and 2.33 (95% CI 1.74 to 3.10), respectively. The odds remained statistically significant and approximately twofold in all separate adjustment models tested.

During 2013-2016, 8 (3.0%) E-type men and 10 (2.6%) E-type women were granted DP, which, compared with M-types, represented a higher HR that was statistically significant for men (HR 3.12, 95% CI 1.27 to 7.63) and remained significant except when multiple sleep variables or working times were adjusted for.

Conclusions

Eveningness appears a previously unrecognised risk factor for poor WA and early disability. In occupational health practice, we suggest chronotype be taken into account in supporting WA, both in individual-level health promotion and organizational-level planning of work schedules. Especially with E-types, the importance of a healthy lifestyle, sleep and suitable working times should be remembered. Actions matching the internal and social rhythm, targeted to either the individual, the environment or both, could help to support careers of E-types.

R ih a T, Nerg I, Jurvelin H, Conlin A, Korhonen M, Ala-Mursula L. Evening chronotype is associated with poor work ability and disability pensions at midlife: a Northern Finland Birth Cohort 1966 Study. *Occup Environ Med.* Published online February 23, 2021. doi:10.1136/oemed-2020-107193