Evidence that self-report sleep impacts on affect in daily life and predicts depression

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Introduction
Sleep and affect are closely related, yet little is known about the directionality and dynamics of sleep-affect regulation in natural circumstances. The Experience Sampling Method (ESM), a technique assessing variables of interest repeatedly, prospectively and in natural settings represents a promising approach to study daily sleep-affect associations in an ecologically valid manner, additionally allowing for the investigation of directionality of effects. As sleep disturbances are thought to be a risk factor for depression, the association between baseline sleep (based on reports within the ESM framework) and depressive symptomatology at follow-up were investigated.

Methods
621 women from a population based study underwent a five day ESM protocol at baseline, assessing prospectively positive affect (PA) and negative affect (NA) ten times a day for five days, along with daily sleep diaries (see figure 1).

A To establish directionality in the day-to-day associations of sleep and affect, sleep variables and affect measures were analyzed in turn as predictor and outcome measures in lagged analyses using mixed regression.

B To investigate the association between baseline sleep and follow-up depression, subjects were assessed at baseline and 4 follow-up assessments (FU 1.2 years later) in terms of depressive symptoms (continuous, SCL-90) or presence of a diagnosis of depression (dichotomous, SCID-1). Baseline sleep variables were used as predictors for depression/depressive symptoms in mixed regressions.

Results A
(1) Sleep as predictor of subsequent affect (sleep \rightarrow affect)

![Figure 2: Standardized effect sizes for the association between sleep and subsequent affect](image1)

(2) Affect as predictor of subsequent sleep (affect \rightarrow sleep)

NA: No significant associations

PA: One significant association; between PA and subsequent sleep quality ($\beta$=.04, p=.019).

Results B
Baseline sleep as predictor for follow-up depression

![Figure 3: Standardized effect sizes for the association between baseline sleep and follow-up depressive symptomatology](image2)

Conclusion
Self-reported sleep impacts on momentary affect the next day, suggesting a role for sleep in affect regulation, particularly positive affect. Sleep predicts onset of depressive symptoms, reaffirming sleep as a causal risk factor rather than a secondary or epiphenomenon in the onset of depressive illness.

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