The Power of When by Michael Breus, PhD

NEW RESEARCH ON CHRONOTYPES

These are some of the more interesting studies I found published in 2016, these are taken directly from www.pubmed.com

1) Chronobiol Int. 2016 Sep 13:1-9. Two in a bed: The influence of couple sleeping and chronotypes on relationship and sleep. An overview. Richter K1,2,3, Adam S1, Geiss L1, Peter L1, Niklewski G1,2.

OBJECTIVE To summarize research on couple sleeping with respect to gender-specific differences and chronotype.

METHODS: Systematic review of the literature.

RESULTS: Millions of adults around the world share their beds with a partner. This may be an expression of intimacy and attachment and tends to intensify romantic relationships. Yet, couple sleeping still has underestimated implications for the quality of the relationship, quality of sleep and for physical and psychological health which are not consistently positive. Implications for research and therapy are discussed.

CONCLUSIONS: Despite the people involved perhaps not even being aware of their nocturnal interactions, it is important that sleeping together becomes a subject of discussion.

2) J Behav Addict. 2016 Aug 8:1-9. Smartphone addiction proneness in relation to sleep and morningness-eveningness in German adolescents. Randler C1,2, Wolfgang L1, Matt K1, Demirhan E3, Horzum MB4, Beşoluk Ş5.

Abstract
Background Mobile phones are an important part of adolescents' life. In this study, the relationships among smartphone addiction, age, gender, and chronotype of German adolescents were examined. Materials and methods Two studies focused on two different measures of smartphone addiction. The Smartphone Addiction Proneness Scale (SAPS) was applied to 342 younger adolescents (13.39 ± 1.77; 176 boys, 165 girls, and 1 not indicated) in Study 1 and the Smartphone Addiction Scale was applied to 208 older adolescents (17.07 ± 4.28; 146 girls and 62 boys) in Study 2, both samples in southwest Germany. In addition, a demographic questionnaire and the Composite Scale of Morningness (CSM) and sleep measures were implemented. Results
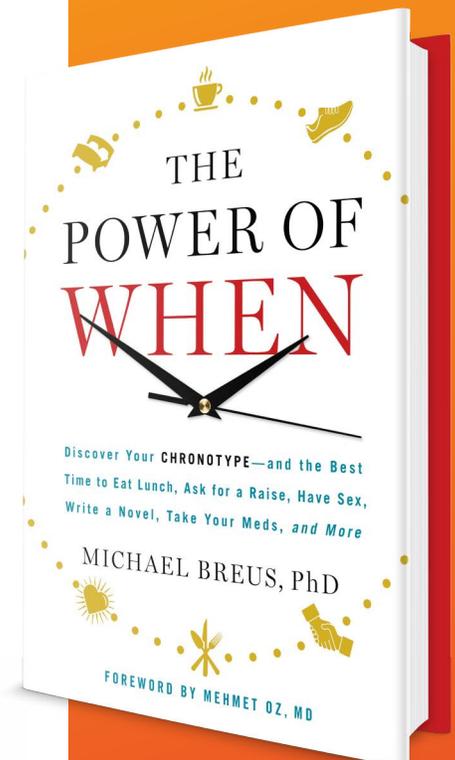
The most remarkable result of this study was that morningness-eveningness (as measured by CSM scores) is an important predictor for smartphone addiction; even stronger than sleep duration. Evening oriented adolescents scored higher on both smartphone addiction scales. In addition, gender is an important predictor for smartphone addiction and girls are more prone to become addicted. In addition, while sleep duration on weekdays negatively predicted SAPS, age, sleep duration on weekends, and midpoint of sleep on weekdays and weekends did not predicted smartphone addiction in both scales. The analysis of covariance revealed statistically significant effects of the covariates gender and age in both studies, as well as the main effect of chronotype. According to the t-test results, girls had higher scores than boys in smartphone addiction. Conclusion Evening types and girls are more prone to become smartphone addicted.

3) Sci Rep. 2016 Jul 8;6:29392. Molecular insights into chronotype and time-of-day effects on decision-making. Ingram KK1, Ay A1,2, Kwon SB1, Woods K1, Escobar S1, Gordon M1, Smith IH3, Bearden N4, Filipowicz A3, Jain K5.

Abstract
Recent reports highlight that human decision-making is influenced by the time of day and whether one is a morning or evening person (i.e., chronotype). Here, we test whether these behavioral effects are associated with endogenous biological rhythms. We asked participants to complete two well-established decision-making tasks in the morning or evening: the matrix task (an ethical decision task) and the balloon analog risk task (BART; a risk-taking task), and we measured their chronotype in two ways. First, participants completed a self-report measure, the Horne-Östberg Morningness-Eveningness Questionnaire (MEQ). Second, we measured the expression of two circadian clock-regulated genes-Per3 and Nr1d2-from peripheral clock cells in participants' hair follicle samples. Using a cosinor model, we estimated the phase of the peripheral clock and assigned RNA chronotypes to participants with advanced (larks) or delayed (owls) phases. The behavioral data were analyzed independently for self-reported (MEQ) and RNA-based chronotypes. We find that significant chronotype and/or time-of-day effects between larks and owls in decision-making tasks occur only in RNA-based chronotypes. Our results provide evidence that time-of-day effects on decision-making can be explained by phase differences in oscillating clock genes and suggest that variation in the molecular clockwork may influence inter-individual differences in decision-making behavior.

Abstract

BACKGROUND: Chronotype has been related to obesity and metabolic disturbances. However, little is known about the relationship between circadian preferences and genetic background in CLOCK genes with obesity and weight loss among severely obese patients after bariatric surgery.

OBJECTIVES: The research goals were (1) to examine whether evening chronotype is related to obesity and weight loss evolution in severely obese followed during 6 years after bariatric surgery and (2) to examine potential interactions between circadian preferences and CLOCK 3111T/C for obesity in this population.

SUBJECTS / METHODS: Participants (n=252, 79% female; age (mean±s.d.): 52±11 years; body mass index (BMI): 46.4±6.0 kg m−2) were grouped into evening and morning types. Obesity and weight loss parameters, energy and macronutrients intake, energy expenditure, chronotype, meal timing, sleep duration and CLOCK genotype were studied.

RESULTS: Evening-type subjects showed significantly higher initial body weight (P=0.015) and BMI (P=0.014) than morning types. Moreover, evening-type, when compared with morning types, lost less weight (percentage of excess weight loss) after bariatric surgery (P=0.015). Weight-loss progression between the two chronotype groups differed significantly from the fourth year after the bariatric surgery toward a higher weight regain among evening types (P<0.05). We also detected a significant interaction between CLOCK 3111T/C SNP and chronotype for body weight at baseline (P<0.001). Specifically, among carriers of the risk allele C, evening types showed higher body weight than morning types (P=0.012). In addition, CLOCK 3111T/C SNP significantly associated with obesity and sleep duration in the older subjects.

CONCLUSIONS: Evening chronotype is associated with higher obesity in severely obese subjects and with lower weight loss effectiveness after bariatric surgery. In addition, circadian preferences interact with CLOCK 3111T/C for obesity. The circadian and genetic assessment could provide tailored weight loss recommendations in subjects who underwent bariatric surgery.International Journal of Obesity advance online publication, 26 July 2016; doi:10.1038/ijo.2016.116.

5) Chronobiol Int. 2016;33(8):972-81.The associations between chrono-type, a healthy diet and obesity. Maukonen M1, Kanerva N1, Partonen T1, Kronholm E1, Konttinen H2, Wennman H1, Männistö S1.

Abstract

Unhealthy diet has been associated with obesity. Evening type has been associated with unhealthier food and nutrient intake that could predict a higher risk of obesity among them as compared to morning type. However, thus far no study has examined the interrelationships between chronotype, a healthy diet and obesity. We examined whether a healthy diet mediates the association between chronotype and obesity and whether chronotype modifies the association between a healthy and obesity. The National FINRISK 2007 Study included 4421 subjects aged 25-74 years. Diet was assessed using a validated food frequency questionnaire. Baltic Sea diet score (BSDS), including nine dietary components, was used as a measure of adherence to a healthy Nordic diet. Weight, height, body fat percentage and waist circumference were measured, and body mass index values were calculated. Chronotype was assessed using a shortened version of Horne and Östberg's morningness-eveningness questionnaire (MEQ). The sum score calculated from MEQ was either used as a continuous variable or divided into tertiles of which the lowest tertile demonstrated evening preference and the highest tertile demonstrated morning preference. A series of regression analyses were conducted to determine whether the BSDS mediates the association between chronotype and obesity. Likelihood ratio test was used to determine whether chronotype modifies the association between the BSDS and the obesity measures. After testing the interaction, chronotype-stratified analysis for the association between the BSDS and obesity measures was determined by linear regression. Generally, the evening types had lower adherence to the BSDS and were more often smokers (men), physically inactive and had lower perceived health than the other chronotypes (p < 0.05). The poorer health behavior of this group, however, was not manifested in their obesity measures, and no evidence that the BSDS would mediate the association between chronotype and obesity was found (p > 0.05). No evidence that chronotype would modify the association between the BSDS and obesity was found either (p > 0.05).

6) Chronobiol Int. 2016;33(7):863-82. Chronotype, gender and general health. Fabbian F1,2, Zucchi B1, De Giorgi A1,2, Tiseo R1, Boari B2, Salmi R2, Cappadona R1, Gianesini G2, Bassi E2, Signani F3, Raparelli V4, Basili S4, Manfredini R1,2.

Abstract

BACKGROUND: Light-dark alternation has always been the strongest external circadian "zeitgeber" for humans. Due to its growing techno-logical preference, our society is quickly transforming toward a pro-gressive "eveningness" (E), with consequences on personal circadian preference (chronotype), depending on gender as well. The aim of this

study was to review the available evidence of possible relationships between chronotype and gender, with relevance on disturbances that could negatively impact general health, including daily life aspects.

METHODS: Electronic searches of the published literature were performed in the databases MEDLINE and Web of Science, by using the Medical Subject Heading (MeSH), when available, or other specific keywords.

RESULTS: Results were grouped into four general areas, i.e. (a) "General and Cardiovascular Issues", (b) "Psychological and Psychopathological Issues", (c) "Sleep and Sleep-Related Issues" and (d) "School and School-Related Issues". (a) E is associated with unhealthy and dietary habits, smoking and alcohol drinking (in younger subjects) and, in adults, with diabetes and metabolic syndrome; (b) E is associated with impulsivity and anger, depression, anxiety disorders and nightmares (especially in women), risk taking behavior, use of alcohol, coffee and stimulants, psychopathology and personality traits; (c) E has been associated, especially in young subjects, with later bedtime and wake-up time, irregular sleep-wake schedule, subjective poor sleep, school performance and motivation, health-related quality of life; (d) E was associated with lowest mood and lower overall grade point average (especially for women).

CONCLUSIONS: Eveningness may impact general health, either physical or mental, sleep, school results and achievements, especially in younger age and in women. The role of family support is crucial, and parents should be deeply informed that abuse of technological devices during night hours may lead to the immature adjustment function of children's endogenous circadian pacemakers.

7) Chronobiol Int. 2016;33(7):821-31. doi: 10.3109/07420528.2016.1171232. Epub 2016 Apr 29. Is problematic mobile phone use explained by chronotype and personality? Demirhan E1, Randler C2, Horzum MB3.

Abstract
In this study, the relationships among problematic mobile phone use, age, gender, personality and chronotype of Turkish university students were examined. The study included 902 university students (73% female, 27% male) and their participation in the study was anonymous and voluntary. Data were collected from each participant by assessing a demographic questionnaire, Composite Scale of Morningness (CSM) as a measure of chronotype, the Big Five Inventory (BIG-5) for personality assessment and Mobile Phone Problem Usage Scale (MPPUS). The most important result was that CSM scores were the best predictor for problematic mobile phone usage, and as a consequence, evening-oriented university students scored higher on the MPPUS. This result remained, even when compared with the most influential personality predictor, conscientiousness. In addition, while extraversion positively predicted, emotional stable and chronotype negatively predicted problematic mobile phone use. Lastly, age and gender were not predictors of problematic mobile phone use.

Berdynaj D1, Boudissa SN1, Grieg MS1, Hope C1, Mahamed SH1, Norbury R1.

Abstract

There is increasing evidence to suggest that late chronotypes are at increased risk for depression. The putative psychological mechanisms underpinning this risk, however, have not been fully explored. The aim of the present study was to examine whether, similar to acutely depressed patients and other "at risk" groups, late chronotype individuals display biases in tasks assaying emotional face recognition, emotional categorisation, recognition and recall and attention. Late chronotype was associated with increased recognition of sad facial expressions, greater recall and reduced latency to correctly recognise previously presented negative personality trait words and reduced allocation of attentional resources to happy faces. The current results indicate that certain negative biases in emotional processing are present in late chronotypes and may, in part, mediate the vulnerability of these individuals to depression. Prospective studies are needed to establish whether the cognitive vulnerabilities reported here predict subsequent depression.

Carciofo R1,2, Yang J1, Song N3, Du F1, Zhang K1.

Abstract

The 44-item and 10-item Big Five Inventory (BFI) personality scales are widely used, but there is a lack of psychometric data for Chinese versions. Eight surveys (total N = 2,496, aged 18-82), assessed a Chinese-language BFI-44 and/or an independently translated Chinese-language BFI-10. Most BFI-44 items loaded strongly or predominantly on the expected dimension, and values of Cronbach's alpha ranged .698-.807. Test-retest coefficients ranged .694-.770 (BFI-44), and .515-.873 (BFI-10). The BFI-44 and BFI-10 showed good convergent and discriminant correlations, and expected associations with gender (females higher for agreeableness and neuroticism), and age (older age associated with more conscientiousness and agreeableness, and also less neuroticism and openness). Additionally, predicted correlations were found with chronotype (morningness positive with conscientiousness), mindfulness (negative with neuroticism, positive with conscientiousness), and mind wandering/daydreaming frequency (negative with conscientiousness, positive with neuroticism). Exploratory analysis found that the Self-discipline facet of conscientiousness positively correlated with morningness and mindfulness, and negatively correlated with mind wandering/daydreaming frequency. Furthermore, Self-discipline was found to be

a mediator in the relationships between chronotype and mindfulness, and chronotype and mind wandering/daydreaming frequency. Overall, the results support the utility of the BFI-44 and BFI-10 for Chinese-language big five personality research.

Abstract
The aim of this work was to study the sleep characteristics, blood pressure (BP) and heart rate (HR) of the police officers working during out-of-phase (OP) and in-phase (IP) duty schedules with respect to their chronotypes. Adult male and female police officers (n = 85) were asked to answer Hindi/English version of different questionnaires to assess their chronotype (morningness-eveningness questionnaire; MEQ), PSQI scores (Pittsburgh sleep quality index), daytime sleepiness (Epworth sleepiness scale, ESS) and fatigue levels (fatigue severity scale, FSS) and fill a sleep log. Based on their PSQI scores, the participating subjects (n = 85) were divided into two categories: good sleepers (58/85) and poor sleepers (27/85). Of these 85 subjects, 23 subjects (good sleepers n = 13; poor sleepers n = 10) volunteered for the next part of the study. At the beginning of the study, the existing duty schedule of these subjects was OP and lasted for 4 days (OP1). Thereafter, they were allotted their preferred (IP) duty schedule for 4 days, followed by OP2 for further 4 days. Over the 12-day period, subjects were monitored for their BP and sleep-wake cycle. Results showed that the poor sleepers improved their sleep quality and HR during IP duty schedule; however, good sleepers were not affected significantly.

Abstract
Emotional intelligence (EI) and morningness-eveningness (M-E) preference have been shown to influence mood states. The present article investigates the way in which these two constructs may interact, influencing morning and evening mood levels. A sample of 172 participants completed a multidimensional mood scale measuring energetic arousal (EA), tense arousal (TA), and hedonic tone at 7:00 and at 22:00. As expected, morning and evening types experienced higher EA at their preferred time of day; effects of M-E on other mood dimensions were weaker. EI was found to correlate with lower TA, but the association was stronger at 22:00, perhaps reflecting the role of EI in managing the social events characteristic for the evening hours. An interactive effect of EI and M-E was found for both diurnal

changes and morning levels of EA. Namely, in individuals higher in EI, there appeared a more marked synchrony effect between chronotype and EA, which was absent in those low in EI; individuals higher in EI showed more pronounced diurnal changes in EA characteristic for their chronotype (i.e., higher EA at morning hours in morning chronotypes; higher EA at evening hours in evening chronotypes), while in participants low in EI, diurnal changes in EA were smaller. Moreover, the characteristic positive association between morningness and EA during morning hours was apparent only in those high in EI. These findings suggest that individual differences in circadian variation in mood reflect several factors, including an endogenous rhythm in energy, the distribution of social activities throughout the day, and the person's awareness of their own energy level.

12) Percept Mot Skills. 2015 Dec;121(3):840-55. doi: 10.2466/27.29. PMS.121c28x1. Epub 2015 Dec 18. THE EFFECT OF CHRONOTYPE ON PSYCHOPHYSIOLOGICAL RESPONSES DURING AEROBIC SELF-PACED EXERCISES. Rossi A1, Formenti D1, Vitale JA1, Calogiuri G2, Weydahl A3.

Abstract

It was hypothesized that an individual's chronotype might influence the response to physical activity at a given time of day. This study aimed to analyze the psychophysiological responses during a walking task at different times of day in individuals with different chronotypes. 46 students (M age=24.8 yr., SD=7.2) filled in the Morningness-Eveningness Questionnaire to determine chronotypes. Heart rate, walking time, and the rating of perceived exertion (RPE) were measured during two self-paced walking sessions: one in the morning (08:30) and one in the afternoon (15:30). A multivariate analysis of variance found a significant interaction between chronotype and time of day. The post hoc analysis showed a significant difference for RPE in the morning session, with evening types reporing a higher RPE compared with the morning types. The chronotype and the time of day when a physical task is undertaken can influence the RPE response, although it might not influence physiological or performance parameters. This has to be taken into account, because it can affect test reliability as well as possibly have a negative influence on the affective responses to a given task.

13) Chronobiol Int. 2016;33(1):1-9. The role of chronotype, gender, test anxiety, and conscientiousness in academic achievement of high school students. Rahafar A1, Maghsudloo M2, Farhangnia S3, Vollmer C4, Randler C1.

Abstract

Previous findings have demonstrated that chronotype (morningness/ intermediate/eveningness) is correlated with cognitive functions, that is, people show higher mental performance when they do a test at their preferred time of day. Empirical studies found a relationship

between morningness and higher learning achievement at school and university. However, only a few of them controlled for other moderating and mediating variables. In this study, we included chronotype, gender, conscientiousness and test anxiety in a structural equation model (SEM) with grade point average (GPA) as academic achievement outcome. Participants were 158 high school students and results revealed that boys and girls differed in GPA and test anxiety significantly, with girls reporting better grades and higher test anxiety. Moreover, there was a positive correlation between conscientiousness and GPA ($r = 0.17$) and morningness ($r = 0.29$), respectively, and a negative correlation between conscientiousness and test anxiety ($r = -0.22$). The SEM demonstrated that gender was the strongest predictor of academic achievement. Lower test anxiety predicted higher GPA in girls but not in boys. Additionally, chronotype as moderator revealed a significant association between gender and GPA for evening types and intermediate types, while intermediate types showed a significant relationship between test anxiety and GPA. Our results suggest that gender is an essential predictor of academic achievement even stronger than low or absent test anxiety. Future studies are needed to explore how gender and chronotype act together in a longitudinal panel design and how chronotype is mediated by conscientiousness in the prediction of academic achievement.