

Editorial: Special Issue on Achievement, Chronotype and Circadian Patterns of Cognition

Christoph Randler and Eda Demirhan

¹University of Tuebingen, Department of Biology, 72076 Tuebingen, Germany

²Sakarya University, Department of Special Education, 54300 Sakarya, Turkey

ARTICLE INFO

Article History:

Received 16.11.2016

Received in revised form

19.11.2016

Accepted 19.11.2016

Available online

25.11.2016

ABSTRACT

This special issue is about circadian rhythm by highlighting its effects on teaching, learning and cognitive performance. Studies related to circadian rhythm and its effects on academic performance arouse more interest in recent years. Therefore we aimed to publish a special issue about this topic. There are eight valuable articles in this special issue and a brief summary of each article is presented in this editorial. In sum the results of articles showed that not only the chronotype (morning, evening type), but also sleep hygiene, sleep quality, sleep problems are important for cognitive activities and these could change in different countries because of their latitude and longitude. Additionally, the studies highlighted here show the need for more detailed assessment of the influential factors of academic achievement in combination with short-time laboratory tests, as well as standardised tests in field settings.

© 2016 IOJES. All rights reserved

Keywords:

Circadian rhythm, teaching, learning, cognitive performance

Introduction

It is with great pleasure seeing this impressive special issue of the International Online Journal of Educational Sciences going viral. As the following short description shows, it is an impressive collection of papers that are all related to school and achievement and deal with circadian rhythms and chronotype in its widest sense. If we look at the very first steps, e.g., the simple bivariate correlations between a chronotype measure and achievement (Randler, 2006; Tonetti et al., 2015), we have moved many steps forward during the last decade in applying increasingly complex models of educational achievement (e.g., Preckel et al., 2013, Arbabi et al., 2015) as well as moving forward with many field experiments (see, e.g. Fernandes Cruz et al. 2016, Masal et al., 2016), including aspects, such as emotions and affect in a state-like manner in addition to achievement (Randler et al., 2016). What is still needed is that the topic of circadian rhythm or chronotype is more widespread in the educational sciences, including educational psychology, as an individual difference trait, which exerts an influence on achievement. Let us hope that this special issue contributes to the field.

Papers in this Issue

Escribano and Díaz-Morales (2016) give us a review about the general effects of chronotype and sleep on affect and achievement in Spain. It has to be acknowledge that Spanish school pupils are among the most “researched” population for chronotype and sleep assessment in the world, which gives many insights for future work in other countries to find similarities and differences.

¹Corresponding author's address: Christoph Randler, Department of Biology, 72076 Tuebingen, Germany

Telephone: +49 7071 29 74619

e-mail: christoph.randler@uni-tuebingen.de

DOI: <http://dx.doi.org/10.15345/iojes.2016.05.001>

A mediation study is presented by Eberspach et al. (2016), who focused on a mediation model to explain school achievement. It is important to see the mediating role of conscientiousness, a trait that seems closely related to morningness/eveningness. This helps us in the discussion if conscientiousness and morningness are indeed two different constructs and they raise the question of measurement (e.g., two-dimensional), which will be an important aspect for future work. Two-dimensional measures should be included in future work on chronotype to broaden the scope.

Tunisian children were studied by Jarraya et al. (2016) in a very demanding protocol, with four testing times over six days of the week, in combination with resting oral temperature. Such an enormous effort is very important to gain new insights, e.g., in daytime functioning but also in weekday effects. The suggestions that school activities that involve new learning should be done in the middle of the week. This gives new insights and helps to improve school everyday life.

It is important seeing Fernandes Cruz et al. (2016) providing us with new insights in very young children on the kindergarten level, an age group that has been rather neglected in previous work and that is usually difficult to "sample". Also, the authors are to be congratulated working in an ecological setting. They did not find any synchrony effects in pre-schoolers. The main time of day effects also have implications for standardized testing.

Masal et al. (2016) assessed sleep quality and academic achievement of children and adolescents in an impressive dataset of N=3677. They found, e.g., that average sleep length, social jetlag, motivation and sleep quality were associated with academic achievement. It is to be highlighted that many sleep related variables have been assessed, and, given their large sample size, these results represent a milestone in clarifying the association among those variables.

Škvorc and Košćec Bjelajac (2016) used the Sleep Beliefs Scale and the Composite Scale of Morningness and revealed correct sleep beliefs in helping professions students of 61%. This is a positive result on the one side, but also, the authors showed that even university students with some formal education on sleep physiology and psychology, could benefit from sleep hygiene education programs. Therefore, this article encourages us to put effort into sleep education/sleep hygiene.

Randler et al. (2016) also found no time of day effect and synchrony effect in 9th graders, these authors used a standardized test. In addition, emotions (affect) improved during the school day.

Kolomeichuk et al. (2016) finally described the Pittsburgh Sleep Quality Index for a Karelian population situated within northwestern Russia, and the authors provide strong evidence for sleep problems in this population, corroborating previous in other countries. They found that sleep problems are higher in girls.

We hope readers will enjoy reading this collection of papers.

Implication for Future Research

Future research should focus on several aspects: Measurement dimensionality should be in the focus of next studies (see Eberspach et al., 2016), however, we need to back-up multidimensional measures, also including amplitude, by biological variables keeping in mind that psychometrics is one important aspect, while biological basis of morningness-eveningness is the other. Field settings and lab experiments should be combined in some places to see how short term measures ("milliseconds" in the lab) are related to somewhat standardised tests in schools (as in Randler et al., 2016), and of course, finally, how they extend until the examination grades (Masal et al., 2016). Although grades are by no means solid, valid and sometimes even not reliable measures, these grades determine study selection at the University and may exert influence on life-relevant decisions. Further, as shown by Masal et al. (2016) and Eberspach et al. (2016) studies assessing grades should go beyond the simple bivariate correlations between morningness-eveningness and grades.

Acknowledgements

A group of editors collaborated with us in the review process of submissions to the special issue. We thank them for their timely and valuable contributions which enabled us to complete the issue. *Hasan Basri Gündüz*, Yıldız Technical University; *İsmail Önder*, Sakarya University; *Şenol Beşoluk*, Sakarya University

References

- Eberspach, L., Fenske, G., Groten, S. C., Neufeldt, L. E., Scherrer, V., & Preckel, F. (2016). Why do larks perform better at school than owls? The mediating effect of conscientiousness, *International Online Journal of Educational Sciences*, 8(5), 4-16.
- Escribano, C. & Díaz-Morales, J. F. (2016). Sleep habits and chronotype effects on academic and cognitive performance in Spanish adolescents: a review, *International Online Journal of Educational Sciences*, 8(5), 17-29.
- Fernandes Cruz, H. M., Gomes, A. A., Martins, A. M., Leitão, J. A., Clarisse, R., Le Floc'h, N., & da Silva, C. F. (2016). Morning-evening types in kindergarten, time-of-day and performance on basic learning skills, *International Online Journal of Educational Sciences*, 8(5), 30-41.
- Jarraya, S., Jarraya, M., & Souissi, N. (2016). Diurnal variations and weekly pattern of cognitive performances in tunisian children, *International Online Journal of Educational Sciences*, 8(5), 62-68.
- Kolomeichuk, S. N., Randler, C., Churov, A. V., & Borisenkov, M. F. (2016). PSQI estimation in the sample of Russian students, *International Online Journal of Educational Sciences*, 8(5), 79-84.
- Masal, E., Önder, İ., Horzum, M. B., Karsh, M. D., & Beşoluk, Ş. (2016). Morningness-eveningness preference, sleep variables and academic achievement of children and adolescents, *International Online Journal of Educational Sciences*, 8(5), 42-53.
- Randler, C., Bechtold, K., & Vogel, M. (2016). Chronotype and time of day do not influence mathematical achievement in standardised tests, but impact on affect – results from a field experiment, *International Online Journal of Educational Sciences*, 8(5), 54-61.
- Škvorc, L., & Košćec Bjelajac, A. (2016). Sleep beliefs and circadian typology of helping professions students, *International Online Journal of Educational Sciences*, 8(5), 69-78.