

Validity of Single-Item Self-Report Measure of Learning Engagement

Paulina Łukowicz, Anna Choynowska, Anna Maria Świątkowska,
Piotr Bereznowski, Wiktor Kornel Wróbel,
Paweł Andrzej Atroszko

University of Gdańsk

Łukowicz, P., Choynowska, A., Świątkowska, A. M., Bereznowski, P., Wróbel, W. K., Atroszko, P. A. (2017). Validity of single-item self-report measure of learning engagement. In J. Nyćkowiak & J. Leśny (Eds.), *Badania i Rozwój Młodych Naukowców w Polsce – Nauki humanistyczne i społeczne. Część IV* (pp. 41–49). Poznań, Poland: Młodzi Naukowcy.

6. Validity of Single-Item Self-Report Measure of Learning Engagement

Łukowicz Paulina, Choynowska Anna, Świątkowska Anna Maria, Bereznowski Piotr, Wróbel Wiktor Kornel, Atroszko Paweł Andrzej

Institute of Psychology, Faculty of Social Sciences, University of Gdańsk

Paulina Łukowicz: paulina.lukowicz@gmail.com

Keywords: school engagement, examination stress, test anxiety, time management

Abstract

Interest in learning engagement of children and university students is constantly growing since 1960s. It resulted in plurality of theories conceptualizing the phenomenon and tools created to measure it. Moreover, studies about learning engagement are often conducted on large samples with multiple measurement in different time periods and multiplicity of other traits measured at the same time. Therefore, valid, reliable, and short tools, which would significantly reduce time needed to fulfil questionnaire and fatigue of participants, are especially desired. Aim of the present study was to provide support for the validity of the single-item, self-report measure of learning engagement. Study was conducted among 235 students from University of Gdańsk, 197 females (83.8%), 35 men (14.9%) and three persons did not state gender (1.3%). Participants were from different faculties, courses of study, years and modes of study. Mean age was 20.46 years ($SD = 1.37$). The obtained data on the validity provided initial support for the construct validity of the measure. Existing research indicate that application of single-item scale can be a promising alternative for a multi-item and multidimensional scales in situations, where quick and easy measurement of learning engagement is needed.

1. Introduction

Statistics show that in Europe alone there was 19.6 million university students in 2013 (Statistical Office of the European Communities 2015). Student's academic success depends upon numerous factors such as personality (O'Connor & Paunonen 2007), socioeconomic status (National Center for Education and Statistics 2016), or learning engagement (Upadyaya & Salmela-Aro 2013). Success can be defined in terms of high grades as well as finishing education with an academic degree. Studies show that learning engagement is associated with better grades (Carini et al. 2006; Li & Lerner 2011) and that students with stable engagement over time are less likely to dropout from school (Archambault et al. 2009; Janosz et al. 2008). Furthermore, in knowledge based economy education is appreciably overlapping with work, suggesting that learning engagement may have a constant influence on one's life even after graduation. Despite all those facts literature still lacks in studies concerning learning engagement among university students, as researchers are mainly focused on children and adolescents (Archambault et al. 2009; Li & Lerner 2011; Woolley & Bowen 2007). To enable more systematic study of this concept in academic settings a single item measure of learning engagement was suggested and preliminary data showed its good reliability (Atroszko 2014), and adequate validity, including concurrent validity with relevant criterion variables, as well as divergent validity with study addiction (Atroszko, 2013; Atroszko et al. 2015). The aim of this paper is to present further data on the validity of this single-item measure of learning engagement.

School engagement is defined in many ways in literature (Appleton et al. 2008). Definition of this construct has been constantly developing since 1960s. As it is described in research by Tobin and Capie (1982), school engagement was first mentioned by Carroll in 1963. School engagement definition development resulted in incoherent and ambiguous outlook on this matter. However, it is mostly viewed as a multidimensional construct that has two components: behavioural (will to participate in school activities and put effort in lessons) and affective (shown interest, sense of belonging, identification, and positive feelings about learning; Marks 2000; Willms 2003). More recent reviews introduced a third component—cognitive, characterised by being invested in learning and academic achievement (Fredricks et al. 2004; Jimerson et al. 2003). Moreover, some researchers use definition with four components: behavioural, cognitive, psychological (defined the same as

affective), and academic (time spend on task, credits earned toward graduation, and homework completion; Christenson & Anderson 2002).

Recently new line of study has emerged on the basis of work-related engagement in which schoolwork engagement was conceptualized. According to this approach, school engagement can be described as consisting of three components: *vigor* (which refers to high mental resilience while studying, a willingness to invest effort in one's schoolwork, and a positive approach), *dedication* (sense of enthusiasm, pride, identification and inspiration regarding school, perceiving schoolwork as meaningful), and *absorption* (behavioural accomplishment and flow-like experiences, such as being fully concentrated and happily engrossed in one's studying; Schaufeli et al. 2002).

The phenomenon of school engagement not only lacks in terms of widely acceptable definition, but also it is described in literature with variety of terms such as school engagement, academic engagement, student engagement (Appleton et al. 2008), schoolwork engagement (Schaufeli et al. 2002), or learning engagement (Atroszko 2014). However, this overabundance of concepts can be tentatively reduced by conceptualizing engagement as associated with the institution and engagement associated with learning. First one relates to the place where process of learning occurs and can be defined by attitudes towards school (attendance and respecting school rules) and emotional connection to peer and teachers, while the second one is connected to the process of learning itself (Upadyaya & Salmela-Aro 2013). In line with this, the approach to the engagement seems to be based on the different aspects of interest and one line of research seems to be more focused on psychological engagement in the process of learning, whereas another one balances two areas more equally.

Where it comes to being engaged in learning not all behaviours are desirable. There is a difference between being heavily engaged in learning and being overly engaged in studying to the point that it disrupts social functioning and health, so called study addiction (Atroszko, Andreassen et al. 2015). Both constructs are associated with being more conscientious and investing more time into learning/studying. However, study addiction is connected to higher neuroticism and general stress, as well as lower quality of life, whereas learning engagement is related to them contrariwise. Furthermore, individuals addicted to studying report poorer general health and quality of sleep. What is more, when controlling learning engagement study addiction is negatively connected to Grade Point Average (Atroszko 2015; Atroszko, Andreassen et al. 2015).

Students can be engaged in a multitude of activities, thus devoting time to them. They can dedicate their whole time to learning and studying school materials to build up their knowledge and skills or they can choose work for immediate financial benefits. They can also choose to invest their time in work in various organisations in school and outside of school gaining competencies, cultivating their hobbies, or working for the society. Almost all of the definitions of learning engagement in Appleton and colleagues (2008), include a component that can be described as a time devoted to learning both at home and at a university/school. Therefore, time spend on learning should be strongly related to learning engagement. On the other hand, investing one's time in organisations can be a problematic matter. On the one hand, students can be engaged in university/school organisations such as students' research groups or clubs in which they develop their skills in conducting research, and developing skills and knowledge, which is directly related to engagement in learning. On the other hand, they can be involved in organisations outside of university/school environment. Such establishments can enable students' progress in their hobbies, contribute to students' moral development as contributors to the society (work in hospice), or help gaining work competencies. Nevertheless, time spend on such activities probably negatively influence engagement in academic learning. As a consequence of different possible extracurricular engagements, time spent on an involvement in extracurricular non-paid activities in structured groups is probably not related to learning engagement.

Furthermore, some students decide to work, and research shows that there are various reasons why students pick up paid jobs (Broadbridge & Swanson 2005). Most often they do it because of financial necessity, but also to earn additional money to improve their living condition and deal with peer pressure, less often to gain experience and improve their CV. On the other hand, paid job may have negative impact on academic achievements due to having less time for studying, tiredness,

skipping classes, and problems with time management (Barke et al. 2000; Broadbridge & Swanson 2005; Broadbridge et al. 2000).

While the different activities can be an important part of one's life, sleep is one of the basic needs necessary to maintain health and productivity. Both daily amount of sleep and its quality have influence on one's health, well-being, and general functioning (Pilcher et al. 1997). Moreover, sleep plays a vital role in learning and memorizing because during REM phase memory consolidation takes place (Walker & Stickgold 2006) and sleep disorders may have negative impact on academic performance (Gaultney 2010). Furthermore, sleep deprivation may cause difficulties with concentration and distort perception (Durmer & Dinges 2005; Killgore 2010). Sleep needs vary between individuals, however, both too little and too much sleep has been related to health risks (Watson et al. 2015). In addition, Önder et al. (2014) showed lack of relationship between academic achievement and sleep length as well as quality of sleep. Moreover, study addiction was linked to worse quality of sleep (Atroszko 2015; Atroszko, Andreassen et al. 2015). Because of complex relationships between individual sleep needs, health, productivity, and learning engagement and achievement, sleep duration probably is not directly related with learning engagement.

According to American Psychiatry Association (2013), depression is characterised by plurality of symptoms from which loss of motivation, impaired concentration, sleep disturbances, and fatigue seem to be the important in the educational context. Lifetime prevalence of major depression varies from 3% to 16.9% across different countries (Andrade et al. 2003). The problem is in fact underestimated as many people still think of it dichotomously, with one either having depression or not. However, it has been shown that depression should be treated as a continuum (Guo et al. 2014; Ruscio & Ruscio 2000; Slade & Andrews 2005) with the spectrum comprised of symptoms of growing intensity and duration with the extreme end classified as Major Depressive Disorder. While depression is seen as a clinical disorder the Authors decided to use term *depressiveness* as a reference to the whole continuum. In light of the recent research depressiveness is negatively associated with school engagement (Li & Lerner 2011) and general well-being (Beekman et al. 2002).

Examination stress, often referred to as test anxiety, is the fear experienced in an assessment situation. Fear-of-failure (Zeidner 1998), negative evaluation from others, and threats to esteem or position (Lowe et al. 2008; Spielberger 1966) are important characteristics of this construct. Students who experience high examination stress are more likely to receive poorer grades (Chapell et al. 2005), however, there is no significant relationship between test anxiety and school engagement (Caraway et al. 2003) as measured by engagement subscale of the Rochester Assessment Package for Students (Wellborn & Connell 1987). Furthermore, test anxiety shares similar characteristics with social anxiety—a fear of being negatively evaluated by others. Based on the assumption that those two constructs are highly related (Knappe et al. 2011), self-presentation theory (Leary 2010) could be used to explain potential relationship between test anxiety and learning engagement. According to this theory, test anxiety should occur, when an individual is motivated to get a particular grade—characteristic of learning engagement (Fredricks et al. 2004)—and doubts that he or she is able to do so. This seems to be a defining characteristic of individuals manifesting study addiction attitudes and behaviours, which can be shortly described as resulting from strong motivation to prove oneself—based in the feeling of inadequacy and low self-esteem—through academic achievements (Atroszko, 2015). Nevertheless, previous studies show that, with higher learning engagement comes higher sense of competencies and self-efficacy in learning (Atroszko 2013). Consequently, examination stress should not be directly related to learning engagement.

Although multidimensional measures are very useful in a comprehensive assessment of individuals, they lack in terms of ease of administration. On the contrary, ultra-brief measures are highly practical as carrying out research becomes quicker and the potential drawbacks of using long instruments such as fatigue of the participants are minimized. Furthermore, single-item scales prove to be valid and reliable tools in many research contexts, and previously were used in the academic context to measure psychosocial functioning (Atroszko, Bagińska et al. 2015; Atroszko, Krzyżaniak et al. 2015; Atroszko, Pianka et al. 2015) and personality (Atroszko, Sawicki, Sendal et al. 2017). Recent study provided preliminary data on convergent validity of a single-item and multi-item measure of satisfaction with life, including almost identical pattern of correlations of the two measures

with criterion variables (Atroszko, Sawicki, Mąkinia et al. 2017). As mentioned above learning engagement is seen as a multidimensional construct, nevertheless, those dimensions are strongly related to each other (Schaufeli et al. 2002). Thus, person's score on one dimension allows fairly accurate prediction of person's score on all other dimensions. Therefore, usage of ultra-brief scale to measure learning engagement seems justified in specific survey situations and the present study aims to provide data on the validity of such tool.

Previous studies with single-item measure showed expected relationships with time devoted to studying, both during university classes and outside of them, and with psychosocial functioning (Atroszko 2013; Atroszko, Andreassen et al. 2015). The aim of the present study is to expand data on validity of this scale by investigating its relationship with time devoted to learning, sleeping, organizations and paid job as well as depressiveness and examination stress. On the basis of previous research and theoretical frameworks it is hypothesized that: learning engagement is positively related to time devoted to learning, both at home and at the university, negatively related to time spend on paid job, and is not related to time spent on work for organizations as well as to time spent on sleeping (H1); learning engagement is negatively related to depressiveness, however, it is not related to examination stress (H2).

2. Methods

Participants. The research was conducted among 235 students, including 197 females (83.8%), 35 males (14.9%), three students did not provide information on their gender (1.3%). Students were between 18 and 26 years old, mean age was $M = 20.46$ years ($SD = 1.37$). Twelve persons were excluded from analyses because they did not answer to questions regarding learning engagement, so correlation analysis was conducted on 223 students, 187 females (83.9%), 35 males (15.7%) and one person did not provide information on their gender (0.4%). Mean age was $M = 20.48$ years ($SD = 1.38$). Participants were from different faculties, courses of study, years and modes of study, all of them were students of University of Gdańsk. This sample was included in the analysis presented in previous paper on a bigger sample (Atroszko 2013) therefore, data on time devoted to studying cannot be interpreted as new independent information.

Measures. Learning engagement was measured using single-item self-report measure which asked the question "How engaged in learning are you?" (Atroszko 2014). Responses ranged from 1 (*I am not at all engaged*) to 7 (*I am completely engaged*). It showed good validity and test-retest reliability (intraclass correlation coefficient was .77) in previous research (Atroszko 2013; Atroszko 2014; Atroszko, Andreassen et al. 2015).

Depressiveness of study participants was measured with Beck Depression Inventory (BDI-IA; Beck & Steer 1993). It is a tool widely used for diagnosing depressive disorders in adults and adolescents. It consists of 21 multiple choice questions regarding symptoms of depression experienced in the past month. To each question there are four alternative responses, valued from 0 to 3 points, varying in level of depression diagnosticity. Questionnaire showed good validity and reliability in previous studies (Ambrosini et al. 1991; Atroszko 2015). In the present sample the Cronbach's alpha reliability coefficient was .90.

Examination stress was measured using single-item self-report measure which asked the question "How stressed are you usually during exams which you take as a part of your studies?" (Atroszko 2014). Responses ranged from 1 (*I am not at all stressed*) to 7 (*I am completely stressed*). It showed good validity and test-retest reliability (intraclass correlation coefficient was .78) in previous research (Atroszko 2014; Wróbel et al. 2016).

To measure time spent on learning at home and at a university, time spent in paid work, and time spent in organizations students were asked to estimate mean number of hours spent weekly on each activity. To measure the amount of time spent on sleeping individuals were asked to estimate mean number of hours spent daily on sleeping. All measures showed good validity and test-retest reliability in the previous research (Atroszko 2015).

Procedure. Data collection used convenience sampling and was performed from February to April 2012. Students were invited to participate anonymously in the study during lectures or classes.

Over 90% agreed to fill in *paper and pencil* questionnaire. No monetary or other material rewards were offered for participation.

Statistical analyses. Means, standard deviations, percentages and correlation coefficients were calculated. All statistical analyses were conducted in IBM SPSS 24.

3. Results

Learning engagement ($M = 4.49$, $SD = 1.34$) was positively related to time spent on learning at home ($r = .43$, $p < .001$), time spent on learning at a university ($r = .23$, $p < .001$) and examination stress ($r = .18$, $p < .01$). Negative association was observed between learning engagement and time spent on paid work ($r = -.19$, $p < .01$), time spent on sleeping ($r = -.22$, $p < .01$) and depressiveness ($r = -.25$, $p < .001$). Relationships between learning engagement and sex of participants as well as their age and time spent in organizations were not statistically significant. Mean scores, standard deviations, and percentages for the study variables as well as their relationships with learning engagement are presented in Tab.1. Full correlation matrix is available from the first author after request.

4. Discussion and conclusions

Hypothesis 1 was partially confirmed. Study showed that learning engagement was positively related to time spent on learning (both at home and at university), negatively related to time spent on paid job, and not related to time spent in organizations. The results are congruent with the current knowledge about correlates of learning engagement (Appleton et al. 2008; Barke et al. 2000; Broadbridge & Swanson 2005; Broadbridge et al. 2000). Moreover, results suggest that time spent on learning at home is a better indicator of learning engagement than time spent on learning at a university. This result can be explained by the fact that being simply present during classes does not mean true engagement in learning.

Tab. 1. Mean scores, standard deviations, and percentages of study variables as well as their correlation coefficients with learning engagement

	<i>M/%</i>	<i>SD</i>	Learning engagement
1. Gender ^a	15.7% males		-.02
2. Age	20.48	1.38	-.02
3. Time spent on learning at home	13.81	12.48	.43***
4. Time spent on learning at a university	17.96	8.20	.23***
5. Time spent on paid work	4.37	9.42	-.19**
6. Time spent on sleeping	7.16	1.70	-.22**
7. Time spent in organizations	1.39	2.58	.08
8. Depressiveness	31.82	9.13	-.25***
9. Examination stress	4.95	1.56	.18**

^a Point-biserial correlation coefficient (0 = females, 1 = males).

* $p < .05$. ** $p < .01$. *** $p < .001$.

In addition, present study showed that learning engagement was negatively related to time spent on sleeping. The result might be linked to the effect of *chronotype* which is linked to *morningness-eveningness* concept and describes one's preferences for hours of sleep and activity (Adan et al. 2012; Martin & Martin 2013; Valdez et al. 2008). Therefore, disparity between social and biological rhythms of different chronotypes', especially during work or school days (Tzischinsky & Shochat 2011), might be reflected in a smaller amount of time spent on sleeping by evening types and their lower grades (Önder et al. 2014). What is more, previous studies showed that study addiction was negatively related to sleep quality (Atroszko 2015; Atroszko, Andreassen et al. 2015). In the current analyses study addiction was not controlled, and to some extent it could account for the negative correlates of high engagement in learning.

Hypothesis 2 was partially confirmed. Learning engagement was negatively related to depressiveness. The results paralleled current knowledge about the relationship between learning

engagement and depressiveness (Li & Lerner 2011). Loss of motivation, reduced concentration, and higher fatigue can contribute to lesser engagement in learning by continually delaying study time as well as distorting the process of gaining knowledge, and taking part in classes. Furthermore, sleep disturbances may also negatively influence learning engagement. Not only they can make memorizing difficult but also, they can disincline to further efforts, since learning does not bring expected effects. Negative relationship with depressiveness provides some data allowing for differentiation of the concept of learning engagement from study addiction in which case increasingly appearing systematic studies show negative relationship with psychosocial functioning (Atroszko 2015; Atroszko, Andreassen et al. 2015, 2016a, 2016b).

Furthermore, learning engagement was positively related to examination stress. However, higher examination stress of highly engaged students might be related to their concerns about grades. Even though, grades themselves are negatively related to examination stress (Caraway et al. 2003; Chapell et al. 2005), the emotional attitude towards them and to the whole process of learning can better reflect learning engagement and be the cause for its positive relationship with exam stress. What is more, in previous studies it was suggested that learning engagement and study addiction may share the component of time and energy devotion to learning (Atroszko 2015; Atroszko, Andreassen et al. 2015). While the former construct is positive, the latter is conceptualized as a negative phenomenon related to worse academic and psychosocial functioning. Positive relationship of single-item learning engagement measure with exam stress may also be explained by the fact that study addiction was not controlled in these analyses.

The obtained data provide further support for the construct validity of the single-item measure of learning engagement. Regarding the strengths of the present study, learning engagement was measured among university students, which is complementary to existing literature predominantly describing children and adolescents (Archambault et al. 2009; Li & Lerner 2011; Woolley & Bowen 2007). Valid and reliable measures of criterion variables were used. Using single-item scales significantly reduces time needed to fulfil questionnaires, therefore minimizes potential drawbacks of using long instruments such as fatigue of the participants. In terms of limitations, the sample was fairly small, predominantly female, and not representative. Consequently, the results cannot be generalized to the population of students in Poland without some restrictions. Moreover, the study lacks data on the convergent validity with a broadly used, valid and reliable measures of school, academic, student and learning engagement. Furthermore, all data in the present study were self-reported which increases the risk of common method bias. Future research should overcome those limitations as well as focus on obtaining and analysing further data on the psychometric properties of scale in various populations. Finally, positive relationship of single-item measure of learning engagement with exam stress and negative relationship with sleeping time suggests that it is warranted to control study addiction whenever learning engagement is investigated. While some unequivocally negative variables such as depression may be directly negatively related to general measure of learning engagement, more subtle distinctions are warranted when it comes to potentially overlapping relationships of engagement and addiction to more context dependant variables such as sleep duration or examination stress. More studies showing differences and similarities between these constructs are necessary.

5. Literature

- Adan A, Archer SN, Hidalgo MP et al. (2012) Circadian Typology: A Comprehensive Review. *Chronobiology International* 29(9): 1153–1175.
- Ambrosini PJ, Metz C, Bianchi MD et al. (1991) Concurrent Validity and Psychometric Properties of the Beck Depression Inventory in Outpatient Adolescents. *Journal of the American Academy of Child & Adolescent Psychiatry* 30(1): 51–57.
- American Psychiatric Association (2013) *Diagnostic and statistical manual of mental disorders* (5th ed.). Washington, DC: Author.
- Andrade L, Caraveo-anduaga JJ, Berglund P et al. (2003) The epidemiology of major depressive episodes: results from the International Consortium of Psychiatric Epidemiology (ICPE) Surveys. *International journal of methods in psychiatric research* 12(1): 3–21.

- Appleton JJ, Christenson SL, Furlong MJ (2008) Student engagement with school: Critical conceptual and methodological issues of the construct. *Psychology in the Schools* 45(5): 369–386.
- Archambault I, Janosz M, Morizot J et al. (2009) Adolescent Behavioral, Affective, and Cognitive Engagement in School: Relationship to Dropout. *Journal of School Health* 79(9): 408–415.
- Atroszko PA (2013) Zachowania i postawy studentów związane z uczeniem się a determinanty rozwoju gospodarki opartej na wiedzy. In J. Osiński & M. Pachocka (Eds.), *Zmieniający się świat. Perspektywa demograficzna, społeczna i gospodarcza* (pp. 185–197). Warszawa, Poland: Oficyna Wydawnicza Szkoły Głównej Handlowej.
- Atroszko PA (2014) Developing brief scales for educational research: Reliability of single-item self-report measures of learning engagement and exam stress. In M McGreevy & R Rita (Eds.), *Proceedings of the 1st Biannual CER Comparative European Research Conference* (pp. 172–175). London, England: Sciemcee Publishing.
- Atroszko PA (2015) *Struktura uzależnienia studentów od uczenia się: wybrane czynniki ryzyka, związek ze stresem i strategiami radzenia sobie oraz funkcjonowaniem psychospołecznym* (Unpublished doctoral dissertation). Uniwersytet Gdański, Gdańsk.
- Atroszko PA, Andreassen CS, Griffiths MD et al. (2015) Study addiction—new area of psychological study: Conceptualization, assessment, and preliminary empirical findings. *Journal of behavioral addictions* 4(2): 75–84.
- Atroszko PA, Andreassen CS, Griffiths MD et al. (2016a) Study addiction: A cross-cultural longitudinal study examining temporal stability and predictors of its changes. *Journal of behavioral addictions* 5(2): 357–362.
- Atroszko PA, Andreassen CS, Griffiths MD et al. (2016b). The relationship between study addiction and work addiction: A cross-cultural longitudinal study. *Journal of Behavioral Addictions* 5(4): 708–714.
- Atroszko PA, Bagińska P, Mokosińska M et al. (2015) Validity and reliability of single-item self-report measures of general quality of life, general health and sleep quality. In M McGreevy & R Rita (Eds.), *Proceedings of the 4th Biannual CER Comparative European Research Conference* (pp. 212–215). London, England: Sciemcee Publishing.
- Atroszko PA, Krzyżaniak P, Sendal L et al. (2015) Validity and reliability of single-item self-report measures of meaning in life and satisfaction with life. In M McGreevy & R Rita (Eds.), *Proceedings of the 4th Biannual CER Comparative European Research Conference* (pp. 212–215). London, England: Sciemcee Publishing.
- Atroszko PA, Pianka L, Raczyńska A et al. (2015) Validity and reliability of single-item self-report measures of social support. In M McGreevy & R Rita (Eds.), *Proceedings of the 4th Biannual CER Comparative European Research Conference* (pp. 216–219). London, England: Sciemcee Publishing.
- Atroszko PA, Sawicki A, Mąkinia A et al. (2017) Further validation of single-item self-report measure of satisfaction with life. In M McGreevy & R. Rita (Eds.), *Proceedings of the 7th Biannual CER Comparative European Research Conference* (pp. 107–110). London, England: Sciemcee Publishing.
- Atroszko PA, Sawicki A, Sendal L et al. (2017) Validity and reliability of single-item self-report measure of global self-esteem. In M McGreevy & R. Rita (Eds.), *Proceedings of the 7th Biannual CER Comparative European Research Conference* (pp. 120–123). London, England: Sciemcee Publishing.
- Barke M, Braidford P, Houston M et al. (2000) *Students in The Labour Market: Nature, Extent and Implications of Term-Time Working Among University of Northumbria Undergraduates* (Research Report No 215). Retrieved from University of Northumbria, Northern Economic Research Unit website: <http://dera.ioe.ac.uk/4464/1/RR215.pdf>
- Beck AT, Steer RA (1993) *Manual for the Beck Depression Inventory*. San Antonio, TX: The psychological corporation.
- Beekman ATF, Penninx BWJH, Deeg, DJH et al. (2002) The impact of depression on the well-being, disability and use of services in older adults: a longitudinal perspective. *Acta Psychiatrica Scandinavica* 105(1): 20–27.

- Broadbridge A, Swanson V (2005) Earning and learning: how term-time employment impacts on students' adjustment to university life. *Journal of Education and Work* 18(2): 235–249.
- Broadbridge A, Swanson V, Taylor C (2000) Retail change: effects on employees' job demands and home life. *The International Review of Retail, Distribution and Consumer Research* 10(4): 417–432.
- Caraway K, Tucker CM, Reinke WM et al. (2003) Self-efficacy, goal orientation, and fear of failure as predictors of school engagement in high school students. *Psychology in the Schools* 40(4): 417–427.
- Carini RM, Kuh GD, Klein SP (2006) Student Engagement and Student Learning: Testing the Linkages. *Research in Higher Education* 47(1): 1–32.
- Chapell MS, Blanding ZB, Silverstein ME et al. (2005) Test Anxiety and Academic Performance in Undergraduate and Graduate Students. *Journal of Educational Psychology* 97(2): 268–274.
- Christenson SL, Anderson AR (2002) Commentary: The Centrality of the Learning Context for Student's Academic Enabler Skills. *School Psychology Review* 31(3): 378–393.
- Durmer JS, Dinges DF (2005) Neurocognitive Consequences of Sleep Deprivation. *Seminars in Neurology* 25(1): 117–129.
- Fredricks JA, Blumenfeld PC, Paris AH (2004) School Engagement: Potential of the Concept, State of the Evidence. *Review of Educational Research* 74(1): 59–109.
- Gaultney JF (2010) The Prevalence of Sleep Disorders in College Students: Impact on Academic Performance. *Journal of American College Health* 59(2): 91–97.
- Guo F, Chen Z, Ren F (2014) The latent structure of depression among Chinese: A taxometric analysis in a nationwide urban sample. *PsyCh journal* 3(4): 234–244.
- Janosz M, Archambault I, Morizot J et al. (2008) School Engagement Trajectories and Their Differential Predictive Relations to Dropout. *Journal of Social Issues* 64(1): 21–40.
- Jimerson SR, Campos E, Greif JL (2003) Toward an Understanding of Definitions and Measures of School Engagement and Related Terms. *The California School Psychologist* 8(1): 7–27.
- Killgore WDS (2010) Effects of sleep deprivation on cognition. In GA Kerkhof & HPA Van Dongen (Eds.), *Progress in Brain Research. Human Sleep and Cognition. Part I: Basic Research* (pp. 105–129). Oxford, UK: Elsevier.
- Knappe S, Beesdo-Baum K, Fehm L et al. (2011) Social fear and social phobia types among community youth: differential clinical features and vulnerability factors. *Journal of psychiatric research*, 45(1): 111-120.
- Leary MR (2010) Social Anxiety as an Early Warning System: A Refinement and Extension of the Self-Presentation Theory of Social Anxiety. In SG Hofmann & PM DiBartolo (Eds.), *Social anxiety: Clinical, developmental, and social perspectives*. San Diego, CA: Academic Press.
- Li Y, Lerner RM (2011) Trajectories of school engagement during adolescence: Implications for grades, depression, delinquency, and substance use. *Developmental Psychology* 47(1): 233–247.
- Lowe PA, Lee SW, Witteborg KM et al. (2008) The Test Anxiety Inventory for Children and Adolescents (TAICA) Examination of the Psychometric Properties of a New Multidimensional Measure of Test Anxiety Among Elementary and Secondary School Students. *Journal of Psychoeducational Assessment* 26(3): 215–230.
- Marks HM (2000) Student Engagement in Instructional Activity: Patterns in the Elementary, Middle, and High School Years. *American Educational Research Journal* 37(1): 153–184.
- Martin PY, Martin R (2013) Morningness–eveningness orientation and attitude change: Evidence for greater systematic processing and attitude change at optimal time-of-day. *Personality and Individual Differences* 54(5): 551–556.
- National Center for Education Statistics (2016) Percentage of high school dropouts among persons 16 to 24 years old (status dropout rate), by income level, and percentage distribution of status dropouts, by labor force status and years of school completed: 1970 through 2015. Retrieved from https://nces.ed.gov/programs/digest/d16/tables/dt16_219.75.asp
- O'Connor MC, Paunonen SV (2007) Big Five personality predictors of post-secondary academic performance. *Personality and Individual Differences* 43(5): 971–990.

- Önder İ, Beşoluk Ş, İskender M et al. (2014) Circadian Preferences, Sleep Quality and Sleep Patterns, Personality, Academic Motivation and Academic Achievement of university students. *Learning and Individual Differences* 32: 184–192.
- Pilcher JJ, Ginter DR, Sadowsky B (1997) Sleep quality versus sleep quantity: Relationships between sleep and measures of health, well-being and sleepiness in college students. *Journal of Psychosomatic Research* 42(6): 583–596.
- Ruscio J, Ruscio AM (2000) Informing the Continuity Controversy: A Taxometric Analysis of Depression. *Journal of Abnormal Psychology* 109(3): 473–487.
- Schaufeli, WB, Martinez IM, Pinto AM et al. (2002) Burnout and Engagement in University — A Cross-National Study. *Journal of Cross-Cultural Psychology* 33(5): 464–481.
- Slade T, Andrews G (2005) Latent structure of depression in a community sample: a taxometric analysis. *Psychological Medicine* 35(4): 489–497.
- Spielberger CD (1966) Theory and Research on Anxiety. In CD Spielberger (Ed.), *Anxiety and Behavior* (pp. 3–20). London, England: Academic Press.
- Statistical Office of the European Communities (2015) Eurostat: Tertiary education statistics. Retrieved from: http://ec.europa.eu/eurostat/statistics-explained/index.php/Tertiary_education_statistics
- Tobin KG, Capie W (1982) Relationships between formal reasoning ability, locus of control, academic engagement and integrated process skill achievement. *Journal of Research in Science Teaching* 19(2): 113–121.
- Tzischinsky O, Shochat T (2011) Eveningness, Sleep Patterns, Daytime Functioning, and Quality of Life in Israeli Adolescents. *Chronobiology International* 28(4): 338–343.
- Upadyaya K, Salmela-Aro K (2013) Development of School Engagement in Association With Academic Success and Well-Being in Varying Social Contexts. *European Psychologist* 18(2): 136–147.
- Valdez P, Reilly T, Waterhouse J (2008) Rhythms of Mental Performance. *Mind, Brain, and Education* 2(1): 7–16.
- Walker MP, Stickgold R (2006) Sleep, Memory, and Plasticity. *Annual Review of Psychology* 57(1): 139–166.
- Watson NF, Badr MS, Belenky G et al. (2015) Recommended Amount of Sleep for a Healthy Adult: A Joint Consensus Statement of the American Academy of Sleep Medicine and Sleep Research Society. *Journal of Clinical Sleep Medicine* 11(6): 591–592.
- Willms JD (2003) Student engagement at school: A sense of belonging and participation—Results from PISA 2000. Retrieved from Organization for Economic Co-operation and Development website: <http://www.oecd.org/edu/school/programmeforinternationalstudentassessmentpisa/33689437.pdf>
- Woolley ME, Bowen GL (2007) In the Context of Risk: Supportive Adults and the School Engagement of Middle School Students. *Family Relations* 56(1): 92–104.
- Wróbel W, Bereznowski P, Raczyńska A et al. (2016) Dimensions of maladaptive perfectionism as mediators of the relationship between social anxiety and examination stress. In J Leśny & J Nyćkowiak (Eds.), *Badania i Rozwój Młodych Naukowców w Polsce—Psychologia i socjologia* (pp. 6–12). Poznań, Poland: Młodzi Naukowcy.
- Zeidner M (1998) *Test Anxiety—State of the Art*. New York, NY: Kluwer Academic Publisher.